DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

RIN 1018–AG71

Endangered and Threatened Wildlife and Plants; Determinations of Whether Designation of Critical Habitat Is Prudent for 81 Plants and Proposed Designations for 76 Plants From the Islands of Kauai and Niihau, Hawaii

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule and notice of determinations of whether designation of critical habitat is prudent.

SUMMARY: We, the U.S. Fish and Wildlife Service, have reconsidered our findings concerning whether designating critical habitat for 81 federally protected plant species currently found on the islands of Kauai and Niihau is prudent. A total of 95 species historically found on these two islands were listed as endangered or threatened species under the Endangered Species Act of 1973, as amended (Act), between 1991 and 1996. Some of these species may also occur on other Hawaiian islands. At the time each plant was listed, we determined that designation of critical habitat was not prudent because designation would increase the degree of threat to the species and/or would not benefit the species.

Due to litigation, we reconsidered our previous prudency determinations for the 95 plants. From this review, we are proposing that critical habitat is prudent for 76 of these species because the potential benefits of designating critical habitat essential for the conservation of these species outweigh the risks of designation. We are proposing that the designation of critical habitat is not prudent for five species. The remaining 14 species historically found on Kauai and/or Niihau, no longer occur on these islands. However, these species do occur on other islands, so proposed prudency determinations will be made in future rules addressing plants on those islands.

This proposed rule also proposes designation of critical habitat for the 76 species. Twenty-three critical habitat units, covering a total of 24,539.23 hectares (60,636.42 acres), are proposed for designation on the islands of Kauai and Niihau.

We solicit data and comments from the public on all aspects of this proposal, including data on the economic and other impacts of the proposed designations. We may revise this proposal to incorporate or address new information received during the comment period.

DATES: We must receive comments from all interested parties by December 7, 2000. Public hearing requests must be received by December 22, 2000.

ADDRESSES: If you wish to comment, you may submit your comments and materials concerning this proposal by any one of several methods:

(1) You may submit written comments and information to the Field Supervisor, U.S. Fish and Wildlife Service, Pacific Islands Office, 300 Ala Moana Blvd., P.O. Box 50088, Honolulu, HI 96850–0001.

(2) You may send comments by electronic mail (e-mail) to KAandNIcrithab pr@fws.gov.

(3) You may hand-deliver written comments to our Pacific Islands Office at 300 Ala Moana Blvd., Room 3–122, Honolulu, HI.

Comments and materials received, as well as supporting documentation used in the preparation of this proposed rule, will be available for public inspection, by appointment, during normal business hours at the Pacific Islands Office.

FOR FURTHER INFORMATION CONTACT: Christa Russell, Coordinator for Listing and Recovery of Plants and Invertebrates, Pacific Islands Office (see **ADDRESSES** section) (telephone: 808/541–3441; facsimile: 808/541–3470).

SUPPLEMENTARY INFORMATION:

Background

We, the U.S. Fish and Wildlife Service (Service), have reconsidered our findings concerning whether designating critical habitat for 81 federally protected plants from the islands of Kauai and Niihau, Kauai County, Hawaii, is prudent. In the Lists of Endangered and Threatened Plants (50 CFR 17.12), there are 95 plant species that, at the time of listing, were found on the islands of Kauai and Niihau (Table 1). Currently, 55 of these species are endemic to the islands of Kauai and/or Niihau, while 24 species are known from one or more other islands, as well as Kauai and/or Niihau. Two species (*Melicope quadrangularis* and *Phyllostegia waimeae*) are thought to be extinct since they have not been seen recently in the wild and no viable genetic material of these species is known to exist. The remaining 14 species, *Acaena exigua, Achyranthes mutica, Ctenitis squamigera, Diellia erecta, Diplazium molokaiense, Hibiscus brackenridgei, Ischaemum byrone, Isodendrion pyrifolium, Mariscus pennatiformis, Phlegmariurus mannii, Phlegmariurus nutans, Silene lanceolata, Solanum incompletum*, and *Vigna o-wahuensis*, are known only from historical records (pre-1970) on Kauai and/or Niihau, or from undocumented observations, or are no longer extant in the wild on these islands. These species do occur on other islands, however.

TABLE 1.—SUMMARY OF ISLAND DISTRIBUTION OF 95 SPECIES FROM KAUAI AND NIIHAU

Species	Island Distribution						
	Kauai	Oahu	Molokai	Lanai	Maui	Hawaii	N.W. Isles, Kahoolawe Niihau
Acaena exigua (liliwai)	H				C		
Achyranthes mutica (NCN)	H				C		
Adenophorus periens (NCN)	C	H	C	R	R	C	
Alectryon macrococcus (mahoe)	C	C	C		C		
Alsinidendron lychnoides (kuawawaunohu)	C						
Alsinidendron viscosum (NCN)	C						
Bonamia menziesii (NCN)	C	C	H	C	C	C	
Brighamia insignis (olulu)	C						Ni(C).
Centaurium sebaeoides (awiwi)	C	C	C	C	C		
Chamaesyce halemanui (akoko)	C						
Ctenitis squamigera (pauoa)	H	C	H	C	C		
Cyanea asarifolia (haha)	C						
Cyanea recta (haha)	C						

TABLE 1.—SUMMARY OF ISLAND DISTRIBUTION OF 95 SPECIES FROM KAUAI AND NIIHAU—Continued

Species	Island Distribution						
	Kauai	Oahu	Molokai	Lanai	Maui	Hawaii	N.W. Isles, Kahoolawe Niihau
Cyanea remyi (haha)	C						
Cyanea undulata (haha)	C						
Cyperus trachysanthos (pu ukaa)	C	C	H	H			Ni(C).
Cyrtandra cyaneoides (mapele)	C						
Cyrtandra limahuliensis (haiwale)	C						
Delissea rhytidosperma (NCN)	C						
Delissea rivularis (NCN)	C						
Delissea undulata (NCN)	C				H	C	Ni(H).
Diellia erecta (NCN)	H	C	C	H	C	C	
Diellia pallida (NCN)	C						
Diplazium molokaiense (NCN)	H	H	H	H	C		
Dubautia latifolia (kahalapehu)	C						
Dubautia pauciflorula (naenae)	C						
Euphorbia haeleeleana (akoko)	C	C					
Exocarpos luteolus (heau)	C						
Flueggea neowawraea (mehamehame)	C	C	H		C	C	
Gouania meyenii (NCN)	C	C					
Hedyotis cookiana (awiwi)	C	H	H			H	
Hedyotis st.-johnii (NCN)	C						
Hesperomannia lydgatei (NCN)	C						
Hibiscadelphus woodii (hau kuahiwi)	C						
Hibiscus brackenridgei (mao hau hele)	H	C	H	C	C	C	Ka(R).
Hibiscus clayi (kokio ulaula)	C						
Hibiscus waimeae ssp. *hannerae* (kokio keokeo)	C						
Ischaemum byrone (Hilo ischaemum)	R	H	C		C	C	
Isodendrion laurifolium (aupaka)	C	C					
Isodendrion longifolium (aupaka)	C	C					
Isodendrion pyrifolium (wahine noho kula)		H	H	H	H	C	Ni(H).
Kokia kauaiensis (kokio)	C						
Labordia lydgatei (kamakahala)	C						
Labordia tinifolia var. *wahiawaensis* (kamakahala)	C						
Lipochaeta fauriei (nehe)	C						
Lipochaeta micrantha (nehe)	C						
Lipochaeta waimeaensis (nehe)	C						
Lobelia niihauensis (NCN)	C	C					Ni(H).
Lysimachia filifolia (NCN)	C	C					
Mariscus pennatiformis (NCN)	H	H			C	H	NW (C).
Melicope haupuensis (alani)	C						
Melicope knudsenii (alani)	C				C		
Melicope pallida (alani)	C	C					
Melicope quadrangularis (alani)	H						
Munroidendron racemosum (NCN)	C						
Myrsine linearifolia (kolea)	C						
Nothocestrum peltatum (aiea)	C						
Panicum niihauense (NCN)	C						Ni(H).
Peucedanum sandwicense (makou)	C	C	C		C		
Phlegmariurus mannii (wawaeiole)	H				C	C	
Phlegmariurus nutans (wawaeiole)	H	C					
Phyllostegia knudsenii (NCN)	C						
Phyllostegia waimeae (NCN)	H						
Phyllostegia wawrana (NCN)	C						
Plantago princeps (ale)	C	C	C		C	H	
Platanthera holochila (NCN)	C	H	C		C		
Poa mannii (NCN)	C						
Poa sandvicensis (NCN)	C						
Poa siphonoglossa (NCN)	C						
Pritchardia aylmer-robinsonii (wahane)							Ni(C).
Pritchardia napaliensis (loulu)	C						
Pritchardia viscosa (loulu)	C						
Pteralyxia kauaiensis (kaulu)	C						
Remya kauaiensis (NCN)	C						
Remya montgomeryi (NCN)	C						
Schiedea apokremnos (NCN)	C						
Schiedea helleri (NCN)	C						
Schiedea kauaiensis (NCN)	C						
Schiedea membranacea (NCN)	C						
Schiedea nuttallii (NCN)	C	C	R		R		
Schiedea spergulina var. *leiopoda* (NCN)	C						

TABLE 1.—SUMMARY OF ISLAND DISTRIBUTION OF 95 SPECIES FROM KAUAI AND NIIHAU—Continued

Species	Island Distribution						
	Kauai	Oahu	Molokai	Lanai	Maui	Hawaii	N.W. Isles, Kahoolawe Niihau
Schiedea spergulina var. *spergulina* (NCN)	C						
Schiedea stellarioides (NCN)	C						
Sesbania tomentosa (ohai)	C	C	C	H	C	C	NW, Ka, Ni (H).
Silene lanceolata (NCN)	H	C	C	H		C	
Solanum incompletum (popolo ku mai)	H		H	H	H	C	
Solanum sandwicense (popolo aiakeakua)	C	H					
Spermolepis hawaiiensis (NCN)	C	C	C	C	C	C	
Stenogyne campanulata (NCN)	C						
Vigna o-wahuensis (NCN)		H	C	C	C	C	Ni (H), Ka (C).
Viola helenae (NCN)	C						
Viola kauaiensis var. *wahiawaensis* (nani wai ale)	C						
Wilkesia hobdyi (iliau)	C						
Xylosma crenatum (NCN)	C						
Zanthoxylum hawaiiense (ae)	C		C	H	C	C	

KEY
C (Current)—population last observed within the past 30 years.
H (Historical)—population not seen for more than 30 years.
R (Reported)—reported from undocumented observations.

The plants considered in this rule were listed as endangered or threatened species under the Endangered Species Act of 1973, as amended (Act), between 1991 and 1996. At the time each plant was listed, we determined that designation of critical habitat was not prudent because designation would increase the degree of threat to the species and/or would not benefit the plant. These not-prudent determinations, along with the not-prudent determinations for 150 other Hawaiian plants, were challenged in *Conservation Council for Hawaii* v. *Babbitt*, 2 F. Supp. 2d 1280 (D. Hawaii). On March 9, 1998, the United States District Court for the District of Hawaii directed us to review the prudency determinations for 245 listed plant species in Hawaii. On August 10, 1998, the court ordered us to publish proposed critical habitat designations or non-designations for at least 100 species by November 30, 2000, and to publish proposed designations or non-designations for the remaining 145 species by April 30, 2002. To comply with the Court's order, between now and April 30, 2002, we plan to publish seven rules that will include proposed determinations of whether critical habitat is prudent, along with designations if appropriate. Each rule, arranged by island or island group (Kauai and Niihau; Maui and Kahoolawe; Lanai; Molokai; Northwest Hawaiian Islands; Hawaii; Oahu), will contain the proposed prudency determination and, when appropriate, proposed designations of critical habitat for each plant species known to occur from that island or group of islands. This determination and proposed rule for 79 plants currently found on the islands of Kauai and Niihau responds to the court order. The proposed prudency determinations for *Melicope quadrangularis* and *Phyllostegia waimeae*, which appear to be no longer extant in the wild, will also be made in this rule. The proposed prudency determinations and, if appropriate, critical habitat designation for the 14 species that no longer occur on Kauai and/or Niihau, but do occur on other islands, will be made in subsequent rules (Table 2).

TABLE 2.—LIST OF PROPOSED RULES IN WHICH PRUDENCY DETERMINATIONS AND CRITICAL HABITAT DESIGNATIONS/NON DESIGNATIONS WILL BE PROPOSED FOR THE 14 SPECIES THAT NO LONGER OCCUR ON KAUAI OR NIIHAU

Species	Proposed rule in which prudency will be proposed	Proposed rule in which critical habitat designations/non designations will be discussed
Acaena exigua	Maui and Kahoolawe	Maui and Kahoolawe.
Achranthes mutica	Hawaii	Hawaii.
Ctenitis squamigera	Maui and Kahoolawe	Maui and Kahoolawe; Lanai; Oahu.
Diellia erecta	Maui and Kahoolawe	Maui and Kahoolawe; Molokai; Hawaii; Oahu.
Diplazium molokaiense	Maui and Kahoolawe	Maui and Kahoolawe.
Hibiscus brackenridgei	Maui and Kahoolawe	Maui and Kahoolawe; Lanai; Hawaii; Oahu.
Ischaemum byrone	Maui and Kahoolawe	Maui and Kahoolawe; Molokai; Hawaii.
Isodendrion pyrifolium	Hawaii	Hawaii.
Mariscus pennatiformis	Maui and Kahoolawe	Maui and Kahoolawe; NW Hawaiian Islands; Hawaii.
Phlegmariurus mannii	Maui and Kahoolawe	Maui and Kahoolawe; Hawaii.
Phlegmariurus nutans	Oahu	Oahu.
Silene lanceolata	Molokai	Molokai; Hawaii; Oahu.
Solanum incompletum	Hawaii	Hawaii.
Vigna o-wahuensis	Maui and Kahoolawe	Maui and Kahoolawe; Lanai; Molokai; Hawaii.

The Islands of Kauai and Niihau

Because of its age and relative isolation, levels of floristic diversity and endemism are higher on Kauai than on any other island in the Hawaiian archipelago. However, the vegetation of 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 (Gagne and Cuddihy 1999). 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 79 extant plant taxa is owned by various private parties, the State of Hawaii (including State parks, forest reserves, and natural area reserves), and the United States of America. Most of the taxa included in this proposed 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.

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 hydrologic 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 the 79 Extant Plant Taxa

Species Endemic to Kauai and Niihau

Alsinidendron lychnoides

Alsinidendron lychnoides, a member of the pink family (Caryophyllaceae), is a weakly climbing or sprawling woody, at least at the base, subshrub 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, number of flowers per cluster, and size of the leaves. It is closely related to *Alsinidendron viscosum*, which differs primarily in having narrower leaves, fewer capsule valves, and fewer flowers per cluster (Wagner *et al.* 1999).

This species was observed with fruits during February (USFWS 1998a). No additional life history information for this species is currently available.

Historically, *Alsinidendron lychnoides* was found 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 on the island of Kauai. Currently, there are a total of four populations with a total of six individual plants (HINHP Database 1999). This species is extant on State-owned land in the Alakai Swamp, including the Alakai Wilderness Preserve, and on State-owned land on the west and east rims of Kalalau Valley (Geographic Decision Systems International (GDSI) 1999). This latter population occurs on the boundary of Hono O Na Pali Natural Area Reserve (NAR) and Na Pali Coast State Park (61 FR 53070; GDSI 1999).

Alsinidendron lychnoides typically grows in montane wet forests dominated by *Metrosideros polymorpha* (ohia) and *Cheirodendron* sp. (olapa), or by *M. polymorpha* and *Dicranopteris linearis* (uluhe), trailing on the ground or on other vegetation, and at elevations between 1,100 and 1,320 m (3,610 and 4,330 ft). Associated plant species include *Carex* sp. (No Common Name (NCN)), *Cyrtandra* sp. (haiwale), *Machaerina* sp. (uki), *Vaccinium* sp. (ohelo), *Peperomia* sp. (ala ala wai nui), *Hedyotis terminalis* (manono), *Astelia* sp. (painiu), and *Broussaisia arguta* (kanawao) (61 FR 53070).

The major threats to this species are competition from the aggressive alien 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 by reduced reproductive vigor due to the small number of extant individuals (61 FR 53070).

Alsinidendron viscosum

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 *Alsinidendron lychnoides*, which differs primarily in having wider leaves and more capsule valves and flowers per cluster (Wagner *et al.* 1999).

Alsinidendron viscosum was observed in flower during January, February, and April 1995 (USFWS 1998a). No additional life history information for this species is currently available.

Historically, *Alsinidendron viscosum* was found at Kaholuamano, Kokee, Halemanu, Nawaimaka, and Waialae areas of northwestern Kauai. Currently, there are a total of four populations containing a total of 98 individuals on the island of Kauai (HINHP Database 1999). These populations are reported on the ridge between Waialae and Nawaimaka Valleys, in the same general area on a north-facing ridge in Nawaimaka Valley, along the Mohihi-Waialae Trail, and along the Ditch Trail in the Kokee area on State and privately owned lands (61 FR 5307; GDSI 1999).

Alsinidendron viscosum is typically found at elevations between 820 and 1,200 m (2,700 and 3,940 ft), on steep slopes in *Acacia koa* (koa)-*Metrosideros polymorpha* lowland or montane mesic or wet forest. Associated plant species include *Alyxia olivaeformis* (maile), *Bidens cosmoides* (poola nui), *Bobea* sp. (ahakea), *Carex* sp., *Coprosma* sp. (pilo), *Dodonaea viscosa* (aalii), *Gahnia* sp. (NCN), *Ilex anomala* (aiea), *Melicope* sp. (alani), *Pleomele* sp. (hala pepe), *Psychotria* sp. (kopiko), and *Schiedea stellarioides* (61 FR 53070).

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

Brighamia insignis

Brighamia insignis, a member of the bellflower family (Campanulaceae), is an unbranched plant with a succulent stem that is bulbous at the bottom and tapers toward the top, ending in a compact rosette of fleshy leaves. This short-lived perennial species is a member of a unique endemic Hawaiian genus with only one other species, *B. rockii*, presently known only from Molokai, from which it differs by the color of its petals, its shorter calyx lobes, and its longer flower stalks (59 FR 9304; Lammers 1999).

Current reproduction is not thought to be sufficient to sustain populations, with poor seedling establishment due to competition with alien grasses as the limiting factor (59 FR 9304). Pollination by native sphingid moths (Sphingidae family) is likely; however, pollination failure is common, due to either a lack of pollinators or a reduction in genetic variability. The flower structure appears to favor outcrossing (pollination between different parent plants). Some vegetative cloning has been observed and flower and leaf size appear to be dependent on moisture availability (59 FR 9304). Seeds of this species are undoubtedly dispersed by gravity.

Although they may be blown for short distances, they are not obviously adapted for wind dispersal, being ovoid to ellipsoid, smooth, and lacking any sort of wing or outgrowth (USFWS 1995).

Historically, *Brighamia insignis* was known from the headland between Hoolulu and Waiahuakua Valleys along the Na Pali Coast on the island of Kauai, and from Kaali Spring on the island of Niihau. Currently, there are a total of five populations containing a total of 45–65 individuals on the islands of Kauai and Niihau (HINHP Database 1999). It is reported on State and privately owned lands along the Na Pali Coast within or on the boundary of the Hono O Na Pali NAR, in Hoolulu, Waiahuakua, and the Haupu Range on the island of Kauai, and on the island of Niihau (GDSI 1999; HINHP Database 1999; Steve Perlman, National Tropical Botanical Garden (NTBG), pers. comm. 2000; USFWS 1995).

Brighamia insignis is found from sea level to 480 m (1,575 ft) elevation on rocky ledges with little soil or on steep sea cliffs in lowland dry grasslands or shrublands with annual rainfall that is usually less than 170 cm (65 in.). Associated native plant taxa include *Artemisia* sp. (ahinahina), *Chamaesyce celastroides* (akoko), *Canthium odoratum* (alahee), *Eragrostis variabilis* (kawelu), *Heteropogon contortus* (pili grass), *Hibiscus kokio* (kokio), *Hibiscus saintjohnianus* (kokio), *Lepidium serra* (anaunau), *Lipochaeta succulenta* (nehe), *Munroidendron racemosum*, and *Sida fallax* (ilima) (59 FR 9304).

The major threats to this plant are browsing and habitat degradation by feral goats; human disturbance; fire; the Carmine spider mite (*Tetranychus cinnabarinus*); a risk of extinction from naturally occurring events, such as landslides or hurricanes, due to the small number of individuals; restricted distribution; reduced reproductive vigor; and competition from alien plant species such as *Melinis minutiflora, Setaria gracilis* (yellow foxtail), *Sporobolus africanus* (smutgrass), *Lantana camara, Psidium cattleianum* (strawberry guava), *Psidium guajava* (common guava), *Kalanchoe pinnata* (air plant), *Ageratum conyzoides* (maile hohono), and *Stachytarpheta dichotoma* (owi) (59 FR 9304).

Chamaesyce halemanui

Chamaesyce halemanui, a member of the spurge family (Euphorbiaceae), is a scandent (climbing) shrub. It is distinguished from closely related species by its decussate leaves, persistent stipules, more compact flower clusters, shorter stems on cyathia, and smaller capsules (57 FR 20580; Koutnik 1987; Koutnik and Huft 1999).

Little is known about the life history of *Chamaesyce halemanui*. Although the plant is a short-lived perennial, its flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown.

Historically, *Chamaesyce halemanui* was found in Kauhao and Makaha Valleys in the Na Pali-Kona Forest Reserve, Mahanaloa Valley in Kuia NAR, the Halemanu drainage in Kokee State Park, and Olokele Canyon on the island of Kauai (HINHP Database 1999; Ken Wood, NTBG, *in litt.* 1999). Currently, there is a total of seven populations, with 88 to 139 individuals, at Kohua Ridge, Makaha Valley, Waialae Ridge, and the Halemanu drainage, all State-owned land (HINHP Database 1999; K. Wood, *in litt.* 1999; GDSI 1999).

Chamaesyce halemanui is typically found on the steep slopes of gulches in mesic *Acacia koa* forests at an elevation of 660 to 1,100 m (2,165 to 3,610 ft). Associated native species include *Metrosideros polymorpha, Alphitonia ponderosa* (kauila), *Antidesma platyphyllum* (hame), *Bobea brevipes* (ahakea lau lii), *Cheirodendron trigynum* (olapa), *Coprosma* sp., *Diospyros sandwicensis* (lama), *Dodonaea viscosa, Elaeocarpus bifidus* (kalia), *Hedyotis terminalis, Kokia kauaiensis, Melicope haupuensis, Pisonia* sp. (papala kepau), *Pittosporum* sp. (ho awa), *Pleomele aurea* (hala pepe), *Psychotria mariniana* (kopiko), *P. greenwelliae* (kopiko), *Pouteria sandwicensis* (alaa), *Santalum freycinetianum* (iliahi), and *Styphelia tameiameiae* (pukiawe) (57 FR 20580).

The major threats to this species are competition from alien plants, such as *Lantana camara, Psidium cattleianum*, and *Stenotaphrum secundatum* (St. Augustine grass); habitat degradation by feral pigs; restricted distribution; small population size; increased potential for extinction resulting from naturally occurring events, such as landslides or hurricanes; and depressed reproductive vigor (57 FR 20580).

Cyanea asarifolia

Cyanea asarifolia, a member of the bellflower family (Campanulaceae), is a sparingly branched shrub. This short-lived perennial species is distinguished from others of the genus that grow on Kauai by the shape of the leaf base, the leaf width in proportion to the length, and the presence of a leaf stalk (59 FR 9304; Lammers 1999).

Little is known about the life history of *Cyanea asarifolia*. Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown.

Historically, *Cyanea asarifolia* was known only from above the bed of Anahola Stream on Kauai (HINHP Database 1999). Currently, two populations with a total of 9 to 11 total individuals are reported from the headwaters of the Wailua River in central Kauai on State-owned land (HINHP Database 1999; GDSI 1999).

This species typically grows in pockets of soil on sheer rock cliffs in lowland wet forests at an elevation of approximately 330 to 730 m (1,080 to 2,400 ft). Associated plant taxa include ferns, *Hedyotis elatior* (awiwi), *Machaerina angustifolia* (uki), *Metrosideros polymorpha, Touchardia latifolia* (olona), and *Urera glabra* (opuhe) (59 FR 9304).

The major threats to this species are a risk of extinction from naturally occurring events, such as hurricanes and rock slides, and/or reduced reproductive vigor due to the small number of existing individuals; introduced slugs; rodents (*Rattus rattus* and *Mus musculus*); and habitat degradation by feral pigs (59 FR 9304).

Cyanea recta

Cyanea recta, a member of the bellflower family (Campanulaceae), is an unbranched shrub with densely hairy flowers. This short-lived perennial species is distinguished from other species in the genus that grow on Kauai by the following collective characteristics: horizontal or ascending inflorescence, narrowly elliptic leaves 12 to 28 cm (4.7 to 11 in.) long, flat leaf margins, and purple berries (Lammers 1999).

No life history information for this species is currently available.

Historically, *Cyanea recta* was found in upper Hanalei Valley, Waioli Valley, Hanapepe Valley, Kalalau cliffs, Wainiha Valley, Makaleha Mountains, Limahuli Valley, Power line Trail, and the Lehua Makanoe-Alakai area on the island of Kauai. Currently, there is a total of eight populations, with between 599 and 609 individuals, on State and private lands in the following areas: upper Waioli Valley, Wainiha Valley, Makaleha Mountains, Limahuli Valley, and the Wahiawa Bog area, Iliiliula drainage, and the back of Hanalei Valley (GDSI 1999; HINHP Database 1999).

Cyanea recta grows in lowland wet or mesic *Metrosideros polymorpha* forest or shrubland, usually in gulches or on slopes, and typically from 400 to 1,200 m (1,310 to 3,940 ft) elevation. Associated native plant species include *Dicranopteris linearis, Psychotria* sp.,

Antidesma sp. (hame), *Cheirodendron platyphyllum* (lapalapa), *Cibotium* sp. (hapuu), and *Diplazium* sp. (NCN) (61 FR 53070).

The major threats to this species are bark removal and other damage by rats (*Rattus* sp.); habitat degradation by feral pigs; browsing by goats; unidentified slugs that feed on the stems; and competition with the alien plant species *Blechnum occidentale* (blechnum fern), *Lantana camara, Rubus rosaefolius* (thimbleberry), *Clidemia hirta* (Koster's curse), *Crassocephalum crepidioides* (NCN), *Deparia petersenii* (NCN), *Erechtites valerianaefolia* (fireweed), *Melastoma candidum* (NCN), *Paspalum conjugatum* (Hilo grass), *Sacciolepis indica* (Glenwood grass), and *Youngia japonica* (Oriental hawksbeard) (61 FR 53070).

Cyanea remyi

Cyanea remyi, a member of the bellflower family (Campanulaceae), is a shrub with generally unbranched, unarmed (lacking prickles) stems which are hairy toward the base. This short-lived perennial species is distinguished from others in the genus that grow on Kauai by its shrubby habit, relatively slender, unarmed stems, smooth or minutely toothed leaves, densely hairy flowers, the shape of the calyx lobes, length of the calyx and corolla, and length of the corolla lobe relative to the floral tube (Lammers 1999).

No life history information for this species is currently available.

Currently, there are seven known populations with a total of 294–384 plants on the island of Kauai (HINHP Database 1999; K. Wood, *in litt.* 1999). *Cyanea remyi* is reported from Waioli Valley, at the base of Mount Waialeale, in the Wahiawa Mountains near Hulua, on the summit plateau of the Makaleha Mountains, and in Limahuli Valley, on State and privately owned lands (Lammers and Lorence 1993; HINHP Database 1999; K. Wood, *in litt.* 1999; GDSI 1999).

Cyanea remyi is usually found in lowland wet forest or shrubland at an elevation of 360 to 930 m (1,180 to 3,060 ft). Associated plant species include *Antidesma* sp., *Cheirodendron* sp., *Diospyros* sp. (lama), *Broussaisia arguta, Metrosideros polymorpha, Freycinetia arborea* (ieie), *Hedyotis terminalis, Machaerina angustifolia, Perrottetia sandwicensis* (olomea), *Psychotria hexandra* (kopiko), and *Syzygium sandwicensis* (ohia ha) (61 FR 53070).

The major threats to this species are competition with the alien plant species *Erechtites valerianaefolia, Paspalum conjugatum, Psidium cattleianum, Rubus rosaefolius,* and *Melastoma candidum;* habitat degradation by feral pigs; browsing by feral goats; predation by rats; unidentified slugs that feed on the stems; and a risk of extinction from naturally occurring events, such as landslides or hurricanes, due to the small number of remaining populations (61 FR 53070).

Cyanea undulata

Cyanea undulata is an unbranched (or the stem is occasionally forked) shrub or undershrub with fine rust-colored hairs covering the lower surface of the leaves (Lammers 1999).

Native members of the Campanulaceae (bellflower) family, including the genus *Cyanea,* are generally believed to have adapted to pollination by native nectar-eating passerine birds, such as the Hawaiian ''honeycreepers.'' The long, tubular, slightly curved flowers of *C. undulata* fit this model, but field observations are lacking. The fleshy orange fruits of this species are adapted for bird dispersal like other species of *Cyanea.* Although recognized as a short-lived perennial species, specific details of the life history of this species, such as growth rates, age plants begin to flower, and longevity of plants, are unknown. *Cyanea undulata* is found in pristine, undisturbed, and uninvaded sites, often on shady stream banks or on steep to vertical slopes that are prone to erosion or landslides (Lorence and Flynn 1991; USFWS 1994).

Historically, *Cyanea undulata* was known only from the Wahiawa Bog area on Kauai. Currently, one population with a total of 28 plants is reported on privately owned land between 630 to 800 m (2,070 to 2,625 ft) elevation along the bank of a tributary of the Wahiawa Stream in the Wahiawa Drainage (HINHP Database 1999; GDSI 1999).

The primary threats to this species include competition with the alien plant species *Psidium cattleianum, Melastoma candidum, Rhodomyrtus tomentosa* (rose myrtle), *Clidemia hirta, Melaleuca quinquenervia* (paperbark tree), *Stachytarpheta dichotoma, Rubus rosaefolius, Elephantopus mollis* (NCN), *Erechtites valerianefolia, Youngia japonica, Pluchea carolinensis* (sourbush), *Oplismenus hirtellus* (basketgrass), *Paspalum conjugatum, Paspalum urvillei* (Vasey grass), *Sacciolepis indica, Setaria gracilis, Deparia petersenii,* and *Cyathea cooperi* (Australian tree fern); trampling by feral pigs; landslides; seed predation by rats; herbivory by introduced slugs; loss of pollinators; hurricanes; decreased reproductive vigor; restricted distribution; and extinction due to unforseen circumstances because of small population size (USFWS 1994; 56 FR 47695).

Cyrtandra cyaneoides

Cyrtandra cyaneoides, a member of the African violet family (Gesneriaceae), is an erect or ascending, fleshy, usually unbranched shrub with opposite toothed leaves which have impressed veins on the lower surface that are sparsely covered with long hairs. This short-lived perennial species differs from others of the genus that grow on Kauai by being a succulent, erect or ascending shrub and having a bilaterally symmetrical calyx that is spindle-shaped in bud and falls off after flowering, leaves with a wrinkled surface, 40 to 55 cm (16 to 22 in.) long and 22 to 35 cm (9 to 14 in.) wide, and berries with shaggy hairs (Wagner *et al.* 1999).

No life history information for this species is currently available.

Historically, *Cyrtandra cyaneoides* was known to occur only along the trail to Waialae Valley on Kauai (61 FR 53070). It is currently known from four populations on private and State lands with a total of 352 to 452 individuals at Namolokama above Lumahai Valley, the Makaleha Plateau, Wainiha Valley, and upper Waioli Valley (GDSI 1999; HINHP Database 1999).

Cyrtandra cyaneoides typically grows on steep slopes or cliffs near streams or waterfalls in lowland or montane wet forest or shrubland dominated by *Metrosideros polymorpha* or a mixture of *M. polymorpha* and *Dicranopteris linearis* between 550 and 1,220 m (1,800 and 4,000 ft) elevation. Associated native species include *Perrottetia sandwicensis, Pipturus* sp. (mamaki), *Bidens* sp. (ko oko olau), *Psychotria* sp., *Pritchardia* sp. (loulu), *Freycinetia arborea, Cyanea* sp. (haha), *Cyrtandra limahuliensis, Diplazium sandwichianum* (NCN), *Gunnera* sp.(ape ape), *Coprosma* sp., *Stenogyne* sp. (NCN), *Machaerina* sp., *Boehmeria grandis* (akolea), *Pipturus* sp., *Cheirodendron* sp., *Hedyotis terminalis,* and *Hedyotis tryblium* (NCN) (61 FR 53070).

The major threats to this species are competition with alien plant species such as *Paspalum conjugatum, Rubus rosaefolius, Deparia petersenii,* and *Drymaria cordata* (pipili); predation of seeds by rats; reduced reproductive vigor and a risk of extinction from naturally occurring events, such as landslides and hurricanes, due to the small number of populations; and habitat degradation by feral pigs (61 FR 53070).

Cyrtandra limahuliensis

Cyrtandra limahuliensis, a member of the African violet family (Gesneriaceae), is an unbranched or few-branched shrub with moderately or densely hairy leaves. The following combination of characteristics distinguishes this short-lived perennial species from others of the genus: the leaves are usually hairy (especially on lower surfaces), the usually symmetrical calyx is tubular or funnel-shaped and encloses the fruit at maturity, and the flowers are borne singly (Wagner *et al.* 1999).

Little is known about the life history of *Cyrtandra limahuliensis*. Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown.

Historically, *Cyrtandra limahuliensis* was known from three locations on Kauai: Wainiha Valley, Lumahai Valley, and near Kilauea River (HINHP Database 1999). Currently, a total of 13 populations containing 928–1,029 plants are reported on private and State lands in Wainiha Valley, Limahuli Valley, Waipa Valley, on Mount Kahili, along the north fork of Wahiawa Stream, along Anahola Stream, Waioli Valley, and near Powerline Trail. However, it has been estimated that the total number of plants on Kauai may be as high as a few thousand (HINHP Database 1999; GDSI 1999).

This species typically grows along streams in lowland wet forests at elevations between 245 and 915 m (800 and 3,000 ft). Associated taxa include *Antidesma* sp., *Cyrtandra kealiea* (haiwale), *Pisonia* sp., *Pipturus* sp., *Cibotium glaucum* (hapuu), *Eugenia* sp. (nioi), *Hedyotis terminalis, Dubautia* sp. (na ena e), *Boehmeria grandis, Touchardia latifolia, Bidens* sp., *Hibiscus waimeae* (kikio ke okeo), *Charpentiera* sp. (papala), *Urera glabra, Pritchardia* sp., *Cyanea* sp., *Perrottetia sandwicensis, Metrosideros polymorpha, Dicranopteris linearis, Gunnera kauaiensis* (apeape), and *Psychotria* sp. (59 FR 9304).

The major threats to this species are competition from alien plant species *(Psidium cattleianum, Paspalum conjugatum, Melastoma candidum, Psidium guajava, Hedychium flavescens* (yellow ginger), *Rubus rosaefolius, Youngia japonica, Erechtites valerianefolia, Blechnum occidentale*, and *Clidemia hirta*); habitat degradation by feral pigs; natural landslides; and hurricanes (59 FR 9304).

Delissea rhytidosperma

Delissea rhytidosperma, a member of the bellflower family (Campanulaceae), is a branched shrub with lance-shaped or elliptic toothed leaves. This short-lived perennial species differs from other taxa of the genus by the shape, length, and margins of the leaves and by having hairs at the base of the anthers (Lammers 1999).

Little is known about the life history of *Delissea rhytidosperma*. Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown.

Historically, *Delissea rhytidosperma* was known from as far north as Wainiha and Limahuli Valleys, as far east as Kapaa and Kealia, and as far south as Haupu Range and between the elevations of 120 and 915 m (400 and 3,000 ft) on the island of Kauai (HINHP Database 1999). Currently, three populations, on State and private lands, with a total of 20 individuals are reported from the Haupu range, Mahanaloa Valley, and Limahuli Valley (HINHP Database 1999; GDSI 1999).

This species generally grows in diverse lowland mesic forests or Acacia koa-dominated lowland dry forests that have well-drained soils with medium-to fine-textured subsoil. Associated native plant taxa includes *Euphorbia haeleeleana, Psychotria hobdyi* (kopiko), *Pisonia* sp., *Pteralyxia* sp. (kaulu), *Dodonaea viscosa, Cyanea* sp., *Hedyotis* sp. (NCN), *Dianella sandwicensis* (ukiuki), *Diospyros sandwicensis, Styphelia tameiameiae*, and *Nestegis sandwicensis* (olopua) (59 FR 9304).

The major threats to this species are predation and/or habitat degradation by mule or black-tailed deer (*Odocoileus hemionus columbianus*), feral pigs, and goats; herbivory by rats and introduced slugs; fire; and competition with the alien plants *Lantana camara, Passiflora ligularis* (sweet granadilla), *Cordyline fruticosa* (ti), and *Passiflora mollissima* (banana poka); and a risk of extinction from naturally occurring events, such as landslides or hurricanes, and/or reduced reproductive vigor due to the small number of existing individuals (59 FR 9304; USFWS 1995).

Delissea rivularis

Delissea rivularis, a member of the bellflower family (Campanulaceae), is a shrub, unbranched or branched near the base, with hairy stems and leaves arranged in a rosette at the tips of the stems. This short-lived perennial species is distinguished from others of the genus by the color, length, and curvature of the corolla, shape of the leaves, and presence of hairs on the stems, leaves, flower clusters, and corolla (Lammers 1999).

No life history information for this species is currently available.

Historically, *Delissea rivularis* was found at Waiakealoha waterfall, Waialae Valley, Hanakoa Valley, and Kaholuamanu on the island of Kauai (61 FR 53070). Currently, this species is known from two populations with a total of 40 individuals (HINHP Database 1999; K. Wood, *in litt.* 1999). One population is reported in the upper Hanakoa Valley stream area on State land within the Hono O Na Pali NAR between 1,100 to 1,220 m (3,610 to 4,000 ft) elevation, while the other is reported in the upper Hanakapiai drainage, on privately owned land (HINHP Database 1999; GDSI 1999; K. Wood *in litt.* 1999).

Delissea rivularis is found on steep slopes in *Metrosideros polymorpha-Cheirodendron trigynum* montane wet or mesic forest, near streams. Associated native species include *Broussaisia arguta*, *Carex* sp., *Coprosma* sp., *Melicope clusiifolia* (kolokolo mokihana), *Melicope anisata* (mokihana), *Psychotria hexandra*, *Dubautia knudsenii* (na ena e), *Diplazium sandwichianum*, *Hedyotis foggiana* (NCN), *Ilex anomala*, and *Sadleria* sp. (amau) (61 FR 53070).

The major threats to this species are competition with the encroaching alien plant *Rubus argutus*; habitat destruction by feral pigs; predation by rats; and reduced reproductive vigor and a risk of extinction from naturally occurring events, such as landslides or hurricanes, due to the small number of remaining individuals (61 FR 53070; USFWS 1998a).

Diellia pallida

Diellia pallida, a member of the spleenwort family (Aspleniaceae), is a plant that grows in tufts of three to four light green, lance-shaped fronds along with a few persistent dead ones. This short-lived perennial species differs from others of this endemic Hawaiian genus by the color and sheen of the midrib, the presence and color of scales on the midrib, and the frequent fusion of sori (Wagner 1952, 1987).

Little is known about the life history of *Diellia pallida*. Reproductive cycles, longevity, specific environmental requirements, and limiting factors are unknown.

Diellia pallida was known historically from Halemanu on the island of Kauai (59 FR 9304). Currently, there is a total of five populations with 20–25 individuals in Koaie Canyon, Mahanaloa Valley, and Makaha Valley, all on State-owned land (HINHP Database 1999; GDSI 1999; K. Wood, *in litt.* 1999).

This species grows on bare soil on steep, rocky, dry slopes in lowland mesic forests, from 520 to 915 m (1,700 to 3,000 ft) in elevation. Associated native plant taxa include *Acacia koa*, *Alectryon macrococcus*, *Antidesma platyphyllum*, *Metrosideros polymorpha*, *Myrsine lanaiensis* (kolea), *Zanthoxylum dipetalum* (ae), *Tetraplasandra kauaiensis* (ohe ohe), *Psychotria mariniana*, *Carex meyenii* (NCN), *Diospyros hillebrandii* (lama), *Hedyotis knudsenii* (NCN), *Canthium odoratum*, *Pteralyxia kauaiensis*, *Nestegis sandwicensis*, *Alyxia olivaeformis*, *Wilkesia gymnoxiphium* (iliau), *Alphitonia ponderosa*, *Styphelia tameiameiae*, and *Rauvolfia sandwicensis* (hao) (59 FR 9304).

The major threats to this species include competition with the alien plants *Lantana camara*, *Melia azedarach* (Chinaberry), *Stenotaphrum secundatum*, *Oplismenus hirtellus*, *Aleurites moluccana* (kukui) and *Cordyline fruticosa*; predation and habitat degradation by feral goats, pigs, and deer; fire; and a risk of extinction from naturally occurring events, such as landslides or hurricanes, and/or reduced reproductive vigor due to the small number of existing individuals (59 FR 9304).

Dubautia latifolia

Dubautia latifolia, a member of the aster family (Asteraceae), is a diffusely branched, woody perennial vine with leaves which are conspicuously net-veined, with the smaller veins outlining nearly square areas. A vining habit, distinct petioles, and broad leaves with conspicuous net veins outlining squarish areas separate this from closely related species (Carr 1982b, 1985, 1999a).

Individual plants of this species do not appear to be able to fertile themselves. Since at least some individuals of *Dubautia latifolia* require cross-pollination, the wide spacing of individual plants (*e.g.*, each 0.5 km (0.3 mi) apart) may pose a threat to the reproductive potential of the species. The very low seed set noted in plants in the wild indicates a reproductive problem, possibly asynchronous flowering. Seedling establishment is also rare and young plants are rarely seen. *Dubautia latifolia* experiences seasonal vegetative decline during the spring and summer, often losing most of its leaves. New growth and flowering occur in the fall with fruits developing in November. Pollinators and seed dispersal agents are unknown (Carr 1982b; USFWS 1995).

Historically, *Dubautia latifolia* was found in the Makaha, Awaawapuhi, Waialae, Kawaiula, and Kauhao Valleys of the Na Pali-Kona Forest Reserve, Nualolo Trail and Valley in Kuia NAR, Halemanu in Kokee State Park, along Mohihi Road in both Kokee State Park and Na Pali-Kona Forest Reserve, along the Mohihi-Waialae Trail on Mohihi and Kohua ridges in both Na Pali-Kona Forest Reserve and Alakai Wilderness Preserve, and at Kaholuamanu on the island of Kauai (Carr 1982b; HINHP Database 1999; GDSI 1999). Currently, there are a total of 24 populations containing between 59–70 individuals on State and privately owned lands in all of the aforementioned areas, except Halemanu and Kaholuamanu (HINHP Database 1999 GDSI 1999; K. Wood, *in litt.* 1999).

This species typically grows on gentle to steep slopes in well drained soil and in semi-open or closed, diverse montane mesic forest dominated by *Acacia koa* and/or *Metrosideros polymorpha*, at elevations of 800 to 1,220 m (2,625 to 4,000 ft). Commonly associated native species are *Pouteria sandwicensis*, *Dodonaea viscosa*, *Nestegis sandwicensis*, *Diplazium sandwichianum*, *Elaeocarpus bifidus*, *Claoxylon sandwicense* (po ola), *Bobea* sp., *Pleomele* sp., *Antidesma* sp., *Cyrtandra* sp., *Xylosma* sp. (maua), *Alphitonia ponderosa*, *Coprosma waimeae* (olena), *Dicranopteris linearis*, *Hedyotis terminalis*, *Ilex anomala*, *Melicope anisata*, *Psychotria mariniana*, and *Scaevola* sp. (naupaka) (59 FR 9304).

The threats to this species include competition from the alien plants *Passiflora mollissima*, *Rubus argutus*, *Lonicera japonica* (Japanese honeysuckle), *Acacia mearnsii* (black wattle), *Hedychium* sp. (ginger), *Erigeron karvinskianus* (daisy fleabane), and *Psidium cattleianum*; damage from trampling and grazing by feral pigs and deer; vehicle traffic and road maintenance; seasonal dieback; small number of extant individuals; and restricted distribution (59 FR 9304).

Dubautia pauciflorula

Dubautia pauciflorula, a member of the aster family (Asteraceae), is a somewhat sprawling shrub or erect small tree with narrowly lance-shaped or elliptic leaves clustered toward the ends of the stems. The tiny, 2–4 flowered heads distinguish this short-lived perennial species from its relatives (Carr 1985, 1999a).

Few details are known about the life history of any *Dubautia* species under natural conditions. Certain species produce viable seed when self-pollinated (self-fertile), although others fail to do so (self-infertile). Low pollinator numbers resulting in reduced cross-pollination and consequently low numbers of viable seeds could explain the small population sizes. Because of their structure and small size, flowers of *D. pauciflorula* are presumably pollinated by small generalist insects, although field observations are lacking. The bristle-like pappus crowning the fruit probably represents an adaptation for wind dispersal. Very little is known about the life cycle of this species, including growth rates, longevity of the plants, and number of years the plants remain reproductive (56 FR 47695; Carr 1985; USFWS 1994).

Historically and currently, this species is found only on State and privately owned lands in the Wahiawa Drainage on Kauai (HINHP Database 1999; GDSI 1999). There are a total of four populations containing 52 individual plants. These populations are found in lowland wet forest at elevations between 670–700 m (2,200–2,300 ft) (HINHP Database 1999).

The threats to this plant include direct competition with the alien plant species such as *Psidium cattleianum* and *Melastoma candidum*, and potential threats from *Rhodomyrtus tomentosa*, *Clidemia hirta*, *Melaleuca quinquenervia*, *Stachytarpheta dichotoma*, *Rubus rosaefolius*, *Elephantopus mollis*, *Erechtites valerianefolia*, *Youngia japonica*, *Pluchea carolinensis*, *Oplismenus hirtellus*, *Paspalum conjugatum*, *Paspalum urvillei*, *Sacciolepis indica*, *Setaria gracilis*, *Deparia petersenii*, and *Cyathea cooperi*; trampling by feral pigs; landslides and erosion; restricted distribution; and hurricanes (56 FR 47695; USFWS 1994).

Exocarpos luteolus

Exocarpos luteolus, a member of the sandalwood family (Santalaceae), is a moderately to densely branched shrub with knobby branches and leaves which are either minute scales or typical leaves. This short-lived perennial species is distinguished from others of the genus by its generally larger fruit with 4 indentations and by the color of the receptacle and fruit (Wagner *et al.* 1999).

Little is known about the life history of *Exocarpos luteolus.* This species tends to grow at habitat edges where there is adequate light (USFWS 1995). Flowering cycles, pollination vectors, seed dispersal agents, longevity, other specific environmental requirements, and limiting factors are unknown.

Historically, *Exocarpos luteolus* was known from three locations on Kauai: Wahiawa Bog, Kaholuamanu, and Kumuwela Ridge (HINHP Database

1999). Currently, there is a total of nine populations containing 69–70 individual plants (HINHP Database 1999; K. Wood, *in litt.* 1999). This species has a scattered distribution on State and privately owned lands and is reported on Kumuwela Ridge; in Kauaikanana Valley; near Honopu Trail; Waialae; on the rim of Kalalau Valley within or on the boundary of Kokee State Park; on Kamalii Ridge in Kealia Forest Reserve; in the Na Pali Kona Forest Reserve; Alakai Swamp; and in the Wahiawa Mountains (HINHP Database 1999; GDSI 1999; K. Wood, *in litt.* 1999).

This species is found at elevations between 475 and 1,290 m (1,560 and 4,220 ft) in a variety of habitats: wet areas bordering swamps; on open, dry ridges; and lowland or montane, *Metrosideros polymorpha*-dominated wet forest communities (59 FR 9304). Associated species include *Acacia koa*, *Cheirodendron trigynum*, *Pouteria sandwicensis*, *Dodonaea viscosa*, *Pleomele aurea*, *Psychotria mariniana*, *Psychotria greenwelliae*, *Bobea brevipes*, *Hedyotis terminalis*, *Elaeocarpus bifidus*, *Melicope haupuensis*, *Dubautia laevigata* (na ena e), *Dianella sandwicensis*, *Poa sandvicensis*, *Schiedea stellarioides*, *Peperomia macraeana* (ala ala wai nui), *Claoxylon sandwicense*, *Santalum freycinetianum*, *Styphelia tameiameiae*, and *Dicranopteris linearis* (59 FR 9304; USFWS 1995).

The major threats to this species are feral goats and pigs; competition with the alien plants *Erigeron karvinskianus*, *Acacia mearnsii*, *Corynocarpus laevigata* (karakanut), *Myrica faya* (firetree), and *Rubus argutus*; seed predation by rats; fire; and erosion (59 FR 9304; USFWS 1995).

Hedyotis st.-johnii

Hedyotis st.-johnii, a member of the coffee family (Rubiaceae), is a succulent perennial herb with slightly woody, trailing, quadrangular stems and fleshy leaves clustered towards the base of the stem. This species is distinguished from related species by its succulence, basally clustered fleshy leaves, shorter floral tube, and large leafy calyx lobes when in fruit (Wagner *et al.* 1999).

Little is known about the life history of *Hedyotis st.-johnii.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown.

Currently, there are a total of six populations, containing 223–278 individuals, on State owned land on the Na Pali coast of Kauai: between Kalalau and Honopu beaches, in Nualolo Valley, Nualolo Kai, at Milolii Beach, and in Polihale (HINHP Database 1999; GDSI 1999).

This plant grows in the crevices of north-facing, near-vertical coastal cliff faces within the spray zone (below 75 m (250 ft)). The associated vegetation is sparse dry coastal shrubland and includes species such as the native *Myoporum sandwicense* (naio), *Eragrostis variabilis*, *Lycium sandwicense* (ohelo kai), *Heteropogon contortus*, *Artemisia australis* (ahinahina), and *Chamaesyce celastroides* (56 FR 49639).

The major threats to this species are herbivory and habitat degradation by feral goats; competition from alien plant species, especially *Pluchea carolinensis*; landslides; fire; trampling and grazing by cattle (*Bos taurus*); and a risk of extinction due to naturally occurring events, such as landslides or hurricanes, as well as decreased reproductive vigor because of the small population sizes and restricted distribution (56 FR 49639; USFWS 1995).

Hesperomannia lydgatei

Hesperomannia lydgatei, a member of the aster family (Asteraceae) is a sparsely branched small long-lived perennial tree with alternately arranged, lance-shaped or elliptic leaves (Wagner *et al.* 1999).

Little is known about the life history of *Hesperomannia lydgatei.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown.

Historically, *Hesperomannia lydgatei* was found in the Wahiawa Mountains of Kauai. Currently, this species is known from State and privately owned lands in the Wahiawa and Waioli Stream areas. There are a total of four populations containing a total of 214 individual plants (GDSI 1999; HINHP Database 1999; K. Wood, *in litt.* 1999).

Hesperomannia lydgatei is found at elevations between 410–915 m (1,345–3,000 ft) along stream banks in rich brown soil and silty clay in *Metrosideros polymorpha* or *M. polymorpha-Dicranopteris linearis* lowland wet forest with one or more of the following associated native plant species: *Adenophorus* sp. (Pendant fern), *Antidesma* sp., *Broussaisia arguta*, *Cheirodendron* sp., *Elaphoglossum* sp. (Ekaha), *Freycinetia arborea*, *Hedyotis terminalis*, *Labordia lydgatei*, *Machaerina angustifolia*, *Peperomia* sp., *Pritchardia* sp., *Psychotria hexandra*, and *Syzygium sandwicensis* (HINHP Database 1999; USFWS 1994).

Threats to the species include alien plants; feral goats; rats; landslides; and erosion (USFWS 1994).

Hibiscadelphus woodii

Hibiscadelphus woodii, a member of the mallow family (Malvaceae), is a small branched, long-lived perennial tree with a rounded crown. *H. woodii* differs from the other Kauai species by differences in leaf surface and characteristics of the whirled leaves or bract and flower color (Lorence and Wagner 1995; Bates 1999).

Flowering material has been collected in March, April, and September, but no fruit set has been observed in spite of efforts to manually outcross and bag the flowers. A museum specimen of a liquid-preserved flower has been identified that contains three adult Nitidulidae beetles, probably an endemic species. The damage by these larvae may be responsible for the observed lack of fruit set in *Hibiscadelphus woodii* (Lorence and Wagner 1995; USFWS 1998a). No additional life history information for this species is currently available.

Hibiscadelphus woodii has been found only at the site of its original discovery on State owned land in Kalalau Valley, within the Na Pali Coast State Park on Kauai; only nine trees of this species are known (HINHP Database 1999; K. Wood, *in litt.* 1999; GDSI 1999).

Hibiscadelphus woodii is found at elevations around 915 m (3,000 ft) on basalt talus or cliff walls in *Metrosideros polymorpha* montane mesic forest. These forests contain one or more of the following associated native plant species: *Bidens sandwicensis* (ko oko olau), *Artemisia australis*, *Melicope pallida*, *Dubautia* sp., *Lepidium serra*, *Lipochaeta* sp. (nehe), *Lysimachia glutinosa* (kolokolo kuahiwi), *Carex meyenii*, *Chamaesyce celastroides* var. *hanapepensis*, *Hedyotis* sp., *Nototrichium* sp. (kului), *Panicum lineale* (NCN), *Myrsine* sp. (kolea), and the federally endangered species *Stenogyne campanulata*, *Lobelia niihauensis*, and *Poa mannii* (61 FR 53070; HINHP Database 1999; Lorence and Wagner 1995).

Major threats to *Hibiscadelphus woodii* are habitat degradation by feral goats and pigs; competition from the alien plant species *Erigeron karvinskianus*; nectar robbing by Japanese white-eye (*Zosterops japonicus*), an introduced bird; and a risk of extinction from naturally occurring events (*e.g.*, rock slides) and reduced reproductive vigor due to the small number of existing individuals at the only known site (61 FR 53070; Lorence and Wagner 1995).

Hibiscus clayi

Hibiscus clayi, a member of the mallow family (Malvaceae), is a long-lived perennial shrub or small tree. This species is distinguished from other native Hawaiian members of the genus by the lengths of the calyx, calyx lobes, and capsule and by the margins of the leaves (Bates 1999).

Little is known about the life history of *Hibiscus clayi*. Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown.

Historically, *Hibiscus clayi* was known from scattered locations on Kauai: the Kokee region on the western side of the island, Moloaa Valley to the north, Nounou Mountain in Wailua to the east, and as far south as Haiku near Halii Stream (HINHP Database 1999). At this time, only the population on State and privately owned lands in the Nounou Mountains, with a total of four trees, is known to be extant (HINHP Database 1999; GDSI 1999).

Hibiscus clayi generally grows on slopes (230 to 350 m (750 to 1,150 ft) elevation) in *Acacia koa* or *Diospyros* sp.-*Pisonia* sp.-*Metrosideros polymorpha* lowland dry or mesic forest with *Hedyotis acuminata* (au), *Pipturus* sp., *Psychotria* sp., *Cyanea hardyi* (haha), *Artemisia australis,* or *Bidens* sp. (59 FR 9304; HINHP Database 1999).

The major threat to this species is competition with alien plants, principally *Psidium cattleianum.* In addition, *Araucaria columnaris* (Norfolk Island pine) has been planted in the area of the Nounou Mountain population. This aggressive alien tree may prevent regeneration of native plants in the understory. The close proximity of most of the *Hibiscus clayi* plants to a hiking trail makes them susceptible to human disturbance. Feral pigs also pose a potential threat to the species. Lastly, the small total number of existing individuals makes the species susceptible to extinction due to naturally occurring events, such as landslides or hurricanes, and/or reduced reproductive vigor (59 FR 9304; HINHP Database 1999).

Hibiscus waimeae ssp. hannerae

Hibiscus waimeae ssp. *hannerae,* a member of the mallow family (Malvaceae), is a gray-barked tree with star-shaped hairs densely covering its leaf and flower stalks and branchlets. The long-lived perennial species is distinguished from others of the genus by the position of the anthers along the staminal column, length of the staminal column relative to the petals, color of the petals, and length of the calyx. Two subspecies, ssp. *hannerae* and ssp. *waimeae,* both endemic to Kauai, are recognized. Subspecies *hannerae* is distinguishable from ssp. *waimeae* by its larger leaves and smaller flowers (Bates 1999).

No life history information for this species is currently available.

Historically, *Hibiscus waimeae* ssp. *hannerae* was known from Kalihiwai and adjacent valleys, Limahuli Valley, and Hanakapiai Valley (Bates 1999; HINHP Database 1999). This subspecies is no longer extant at Kalihiwai. Currently, there are two populations containing 27 individuals on State and privately owned lands in the Limahuli and Hanakapiai Valleys (HINHP Database 1999; GDSI 1999).

Hibiscus waimeae ssp. *hannerae* grows between 190 and 560 m (620 and 1,850 ft) elevation. It is found in *Metrosideros polymorpha-Dicranopteris linearis* lowland wet forest or in *Pisonia* sp.-*Charpentiera elliptica* (papala) lowland wet or mesic forest with *Antidesma* sp., *Psychotria* sp., *Pipturus* sp., *Bidens* sp., *Bobea* sp., *Sadleria* sp., *Cyrtandra* sp. *Cyanea* sp., *Cibotium* sp., *Perrottetia sandwicensis,* and *Syzygium sandwicensis* (USFWS 1998a; Bates 1999; HINHP Database 1999).

Major threats to *Hibiscus waimeae* ssp. *hannerae* are habitat degradation by feral pigs, competition with alien plant species, and a risk of extinction from naturally occurring events (e.g., landscapes and hurricanes) and/or reduced reproductive vigor due to the small number of remaining populations (61 FR 53070; HINHP Database 1999).

Kokia kauaiensis

Kokia kauaiensis, a member of the mallow family (Malvaceae), is a small tree. This long-lived perennial species is distinguished from others of this endemic Hawaiian genus by the length of the bracts surrounding the flower head, number of lobes and the width of the leaves, the length of the petals, and the length of the hairs on the seeds (Bates 1999).

No life history information for this species is currently available.

Historically, *Kokia kauaiensis* was found at seven scattered populations on northwestern Kauai (HINHP Database 1999). Currently, there are a total of 11 populations with 179 to 184 individuals, found in Paaiki, Mahanaloa, Kuia, Kalalau, and Pohakuao Valleys, Na Pali Coast State Park, and the Koaie Stream branch of Waimeae Canyon, all on State-owned land (HINHP Database 1999; GDSI 1999; K. Wood, *in litt.* 1999).

Kokia kauaiensis typically grows in diverse mesic forest between 350 to 660 m (1,150 to 2,165 ft) elevation. Associated species include *Bobea* sp., *Acacia koa, Diospyros sandwicensis, Hedyotis* sp., *Pleomele* sp., *Xylosma* sp., *Isodendrion* sp. (aupaka), *Pisonia* sp., *Nestegis sandwicensis, Syzygium sandwicensis, Antidesma* sp., *Alyxia olivaeformis, Pouteria sandwicensis, Streblus pendulinus* (aiai), *Canthium odoratum, Nototrichium* sp., *Pteralyxia kauaiensis, Dicranopteris linearis, Hibiscus* sp. (aloalo), *Flueggea neowawraea, Rauvolfia sandwicensis, Melicope* sp., *Diellia laciniata* (palapalai lau lii), *Tetraplasandra* sp. (ohe ohe), *Chamaesyce celastroides, Lipochaeta fauriei, Dodonaea viscosa, Santalum* sp. (iliahi), *Claoxylon* sandwicense, and *Metrosideros polymorpha* (USFWS 1998a; Bates 1999; HINHP Database 1999; K. Wood, *in litt.* 1999).

Competition with and habitat degradation by invasive alien plant species, substrate loss from erosion, habitat degradation and browsing by feral goats and deer, and seed predation by rats are the major threats affecting the survival of *Kokia kauaiensis* (Wood and Perlman 1993; USFWS 1998a; HINHP Database 1999).

Labordia lydgatei

Labordia lydgatei, a member of the Logania family (Loganiaceae), is a much-branched perennial shrub or small tree with sparsely hairy, square stems. The small size of the flowers and capsules borne on sessile inflorescences distinguish it from other members of the genus growing in the same area (Wagner *et al.* 1999).

Immature fruits were seen on two plants during surveys in 1991 and 1992 by botanists from NTBG, and remnants of old fruiting bodies were seen on another, suggesting that the plants are self-fertile. It is also suspected that the fruits of this species are adapted for bird dispersal. Due to a lack of bird or other native pollinators, pollination may be inhibited (USFWS 1994). Microhabitat requirements for seed germination and growth may also be extremely specific. Virtually nothing is known about the life history or ecology of this species.

This species was originally known from the Wahiawa Drainage, Waioli Stream Valley, and Makaleha Mountains on Kauai (HINHP Database 1999). *Labordia lydgatei* is currently known from six populations, consisting of 37 individual plants, located on State and privately owned lands along one of the tributaries of the Wahiawa Stream, as well as in Limahuli and Lumahai Valleys (HINHP Database 1999; GDSI 1999; K. Wood, *in litt.* 1999).

Labordia lydgatei is found in *Metrosideros polymorpha-Dicranopteris linearis* lowland wet forest at elevations between 635 and 855 m (2,080 to 2800 ft). Associated native plants include *Psychotria* sp., *Hedyotis terminalis* sp., *Cyanea* sp., *Cyrtandra* sp., *Labordia hirtella* (NCN), *Antidesma platyphyllum* var. *hildebrandi, Syzygium sandwicensis, Ilex anomala,* and *Dubautia knudsenii* (USFWS 1994; HINHP Database 1999; K. Wood, *in litt.* 1999).

Competition from alien plants poses the greatest threat to the survival of *Labordia lydgatei* (56 FR 47695). Additional threats include habitat degradation from feral pigs; rats, a potential seed predator; landslides and erosion; and a lack of dispersal, germination or pollination agents (USFWS 1994).

Labordia tinifolia var. *wahiawaensis*

Labordia tinifolia var. *wahiawaensis,* a member of the Logania family (Loganiaceae), is a shrub or small tree with hairless, cylindrical young branches. This long-lived perennial species differs from others of the genus by having a long common flower cluster stalk, hairless young stems and leaf surfaces, transversely wrinkled capsule valves, and corolla lobes usually 1.7 to 2.3 mm (0.1 in.) long (Wagner *et al.* 1999). Three varieties of *Labordia tinifolia* are recognized: var. *lanaiensis* on Lanai and Molokai; var. *tinifolia* on Kauai, Oahu, Molokai, Maui, and Hawaii; and var. *wahiawaensis,* endemic to Kauai. Variety *wahiawaensis* is distinguished from the other two by its larger corolla (Wagner *et al.* 1999).

No life history information for this subspecies is currently available.

Labordia tinifolia var. *wahiawaensis* is only known from one population with a total of 20–30 individual plants on private land in the Wahiawa Drainage in the Wahiawa Mountains from (GDSI 1999; HINHP Database 1999).

Labordia tinifolia var. *wahiawaensis* grows along streambanks in lowland wet forests dominated by *Metrosideros polymorpha* at elevations between 300 to 920 m (985 to 3,020 ft), with *Cheirodendron* sp., *Dicranopteris linearis, Cyrtandra* sp., *Antidesma* sp., *Psychotria* sp., *Hedyotis terminalis,* or *Athyrium microphyllum* (HINHP Database 1999).

The primary threats to the remaining individuals of *Labordia tinifolia* var. *wahiawaensis* are competition with alien plants, habitat degradation by feral pigs, trampling by humans, and a risk of extinction from catastrophic random events or reduced reproductive vigor due to the small number of individuals in a single population (61 FR 53070).

Lipochaeta fauriei

Lipochaeta fauriei, a member of the aster family (Asteraceae), is a perennial herb with somewhat woody, erect or climbing stems. This short-lived perennial species differs from other species on Kauai by having a greater number of disk and ray flowers per flower head, longer ray flowers, and longer leaves and leaf stalks (Gardner 1976, 1979; USFWS 1995; Wagner *et al.* 1985, 1999).

Little is known about the life history of *Lipochaeta fauriei.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown.

Historically and currently, *Lipochaeta fauriei* is known from Olokele Canyon on Kauai (Gardner 1979, HINHP Database 1999). This species is now also found on State and privately owned lands in Poopooiki, Haeleele, and Hikimoe Valleys (HINHP Database 1999; GDSI 1999; K. Wood, *in litt.* 1999). Currently there is a total of four populations with 132 individuals (HINHP Database 1999; K. Wood, *in litt.* 1999). A population in Koaie Canyon previously thought to be *L. fauriei* was later identified as *L. subcordata* (USFWS 1995).

This species grows most often in moderate shade to full sun and is usually found on the sides of steep gulches in diverse lowland mesic forests between 480 and 900 m (1,575 and 2,950 ft) elevation (Wagner *et al.* 1999). Associated native plant taxa include *Myrsine lanaiensis, Euphorbia haeleeleana, Acacia koa, Pleomele aurea, Sapindus oahuensis* (lonomea), *Nestegis sandwicensis, Dodonaea viscosa, Psychotria mariniana, Psychotria greenwelliae, Kokia kauaiensis, Diospyros* sp. and *Hibiscus waimeae* (HINHP Database 1999; K. Wood, *in litt.* 1999).

Major threats to *Lipochaeta fauriei* are predation and habitat degradation by feral goats and pigs, and competition with invasive alien plants. Fire is also a significant threat to *L. fauriei* due to the invasion of *Melinis minutiflora,* a fire-adapted grass that creates unnaturally high fuel loads. The small total number of individuals makes the species susceptible to extinction from naturally occurring events, such as landslides or hurricanes, and/or reduced reproductive vigor (59 FR 9304; USFWS 1995; HINHP Database 1999).

Lipochaeta micrantha

Lipochaeta micrantha, a member of the aster family (Asteraceae), is a somewhat woody short-lived perennial herb. The small number of disk florets separates this species from the other members of the genus on the island of Kauai. The two recognized varieties of this species, var. *exigua* and var. *micrantha,* are distinguished by differences in leaf length and width, degree of leaf dissection, and the length of the ray florets (Gardner 1976, 1979; Wagner *et al.* 1999).

Little is known about the life histories of *Lipochaeta micrantha* var. *exigua* or *L. m.* var. *micrantha.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown.

Historically, *Lipochaeta micrantha* var. *exigua* was only known from the Haupu Range on Kauai. Currently, three populations of *L. m.* var. *exigua,* with 102–112 individuals, are known from privately owned land in the vicinity of Haupu Range and southwest of Hokunui summit (HINHP 1999; GDSI 1999). Historically, *L. m.* var. *micrantha* was known from Olokele Canyon, Hanapepe Valley, and the Koloa District on Kauai (HINHP Database 1999). Currently, this variety is only known from three populations totalling 56 to 66 individuals in the Koaie branch of Waimeae Canyon (State owned land) (HINHP 1999; GDSI 1999).

Lipochaeta micrantha var. *exigua* grows on cliffs, ridges, or slopes in grassy, shrubby or dry mixed communities between 305–430 m (1,000–1,400 ft) elevation with *Artemisia australis, Bidens sandvicensis, Plectranthus parviflorus* (ala ala wai nui), *Chamaesyce celastroides, Diospyros* sp., *Canthium odoratum, Neraudia* sp., *Pipturus* sp., *Hibiscus kokio, Sida fallax, Eragrostis* sp. (kawelu), *and Lepidium bidentatum* (anaunau) (USFWS 1995; HINHP 1999). *Lipochaeta micrantha* var. *micrantha* grows on basalt cliffs, stream banks, or level ground in mesic or diverse *Metrosideros polymorpha-Diospyros* sp. forest between 610–720 m (2,000–2,360 ft) elevation with *Lobelia niihauensis, Chamaesyce celastroides* var. *hanapepensis, Neraudia kauaiensis, Rumex* sp. (dock or sorrel), *Nototrichium* sp., *Artemisia* sp., *Dodonaea viscosa, Antidesma* sp., *Hibiscus* sp., *Xylosma* sp., *Pleomele* sp., *Melicope* sp., *Bobea* sp., and *Acacia koa* (USFWS 1995; HINHP 1999).

The major threats to both varieties of *Lipochaeta micrantha* are habitat degradation by feral pigs and goats, and

competition with alien plant species, such as *Lantana* camara, *Pluchea carolinensis, Erigeron karvinskianus,* and *Stachytarpheta dichotoma.* The species is also threatened by extinction from naturally occurring events, such as landslides or hurricanes, and/or reduced reproductive vigor due to the small number of existing populations (Lorence and Flynn 1991; USFWS 1995; HINHP Database 1999).

Lipochaeta waimeaensis

Lipochaeta waimeaensis, a member of the aster family (Asteraceae), is a low growing, somewhat woody, short-lived perennial herb. This species is distinguished from other *Lipochaeta* on Kauai by leaf shape and the presence of shorter leaf stalks and ray florets (Gardner 1976, 1979; Wagner *et al.* 1999).

Little is known about the life history of *Lipochaeta waimeaensis.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown.

Lipochaeta waimeaensis is known only from the original site of discovery along the rim of Kauai's Waimeae Canyon on State and privately owned lands. There are no more than 100 individuals (HINHP Database 1999; GDSI 1999).

This population grows on eroded soil on a precipitous, shrub-covered gulch in a diverse lowland mesic forest between 350 and 400 m (1,150 and 1,310 ft) elevation with *Dodonaea viscosa* and *Lipochaeta connata* (nehe) (HINHP Database 1999; Wagner *et al.* 1999).

The major threats to *Lipochaeta waimeaensis* are competition from alien plants and habitat destruction by feral goats, whose presence exacerbates the existing soil erosion problem at the site. The single population, and thus the entire species, is threatened by extinction from naturally occurring events, such as landslides or hurricanes, and/or reduced reproductive vigor due to the small number of existing individuals (59 FR 9304).

Melicope haupuensis

Melicope haupuensis, a member of the citrus family (Rutaceae), is a small long-lived perennial tree. Unlike other taxa of this genus on Kauai, the exocarp and endocarp are hairless and the sepals are covered with dense hairs (Stone *et al.* 1999).

Little is known about the life history of *Melicope haupuensis.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown.

For 62 years, *Melicope haupuensis* was known only from the site of its original discovery on the north side of Haupu Ridge on Kauai (HINHP Database 1999). This population is now gone. The species is now known from single trees at three separate locations on State owned land (along the banks of Koaie Stream in Waimeae Canyon, Awaawapuh, and Honopu) (GDSI 1999; HINHP Database 1999; K. Wood, *in litt.* 1999).

Melicope haupuensis grows on moist talus slopes in *Metrosideros polymorpha*-dominated lowland mesic forests or *Metrosideros polymorpha-Acacia koa* montane mesic forest at elevations between 375 and 1,075 m (1,230 to 3,530 ft). Associated species include *Dodonaea viscosa, Diospyros* sp., *Psychotria mariniana, P. greenwelliae, Melicope ovata* (alani), *M. anisata, M. barbigera* (alani), *Dianella sandwicensis, Pritchardia minor* (loulu), *Tetraplasandra waimeae* (oheohe), *Claoxylon sandwicensis, Cheirodendron trigynum, Pleomele aurea, Cryptocarya mannii* (holio), *Pouteria sandwicensis, Bobea brevipes, Hedyotis terminalis, Elaeocarpus bifidus,* and *Antidesma* sp. (HINHP Database 1999).

Habitat degradation by feral goats and competition with invasive alien plant taxa are the major threats to *Melicope haupuensis.* In addition, this species may be susceptible to the black twig borer (*Xylosandrus compactus*). The existence of only three known trees constitutes an extreme threat of extinction from naturally occurring events, such as landslides or hurricanes, or reduced reproductive vigor (59 FR 9304; Hara and Beardsley 1979; Medeiros *et al.* 1986; HINHP Database 1999).

Munroidendron racemosum

Munroidendron racemosum, a member of the ginseng family (Araliaceae), is a small tree with a straight gray trunk crowned with spreading branches. This long-lived perennial species is the only member of a genus endemic to Hawaii. The genus is distinguished from other closely related Hawaiian genera of the family by its distinct flower clusters and corolla (Constance and Affolter 1999).

Reproduction occurs year-round, with flowers and fruits found throughout the year. Self pollination is assumed to occur since viable seeds have been produced by isolated individuals. Pollinators have not been observed, but insect pollination is likely. Dispersal mechanisms are unknown (USFWS 1995).

Historically, *Munroidendron racemosum* was known from scattered locations throughout the island of Kauai (HINHP Database 1999). Populations are now known from the Na Pali Coast within Na Pali Coast State Park and Hono O Na Pali NAR, in the Poomau and Koaie branches of Waimeae Canyon, in the Haupu Range area, and on Nounou Mountain. There are currently 15 known populations with a total of 58 to 98 individuals on State and privately owned lands (HINHP Database 1999; GDSI 1999).

Munroidendron racemosum is typically found on steep exposed cliffs or on ridge slopes in coastal to lowland mesic forests between 120 and 400 m (395 and 1,310 ft) elevation (Lowrey 1999). Associated plant taxa include *Pisonia umbellifera* (papala kepau), *Canavalia galeata* (awikiwiki), *Sida fallax, Brighamia insignis, Canthium odoratum, Psychotria* sp., *Nestegis sandwicensis, Tetraplasandra* sp., *Bobea timonioides* (ahakea), *Rauvolfia sandwicensis, Pleomele* sp., *Pouteria sandwicensis,* and *Diospyros* sp. (59 FR 9304; Gagne and Cuddihy 1999; HINHP Database 1999).

The major threat to *Munroidendron racemosum* is competition with alien plant species, such as *Aleurites moluccana, Psidium guajava, Lantana camara,* and *Leucaena leucocephala.* Other threats include habitat degradation by feral goats, fire, and fruit predation by rats. In addition, a mature, cultivated tree was observed being killed by an introduced insect of the long-horned beetle family (Cerambycidae) and there is the potential of the beetle attacking and damaging or killing wild trees. Because each population of this species contains only a small number of trees, and the total number of individuals is less than 100, the species is threatened by extinction from naturally occurring events, such as landslides or hurricanes, and reduced reproductive vigor (59 FR 9304; USFWS 1995; HINHP Database 1999).

Myrsine linearifolia

Myrsine linearifolia, a member of the myrsine family (Myrsinaceae), is a branched shrub. This long-lived perennial species is distinguished from others of the genus by the shape, length, and width of the leaves, length of the petals, and number of flowers per cluster (Wagner *et al.* 1999).

No life history information for this species is currently available.

Historically, *Myrsine linearifolia* was found at scattered locations on Kauai: Olokele Valley, Kalualea, Kalalau Valley, Kahuamaa Flat, Limahuli-Hanakapiai Ridge, Koaie Stream, Pohakuao, Namolokama Summit

Plateau, and Haupu (HINHP Database 1999). There are currently eight populations with 360 to 421 individuals on State and privately owned lands (GDSI 1999; HINHP Database 1999; K. Wood, *in litt.* 1999). The populations are found in Kalalau Valley, Kahuamaa Flat, Limahuli Valley, Hanakapiai Ridge, Koaie Stream, Pohakuao, Namolokama Summit Plateau, and the Wahiawa Drainage (HINHP Database 1999; K. Wood, *in litt.* 1999).

Myrsine linearifolia typically grows from 585 to 1,280 m (1,920 to 4,200 ft) elevation, in diverse mesic or wet lowland or montane *Metrosideros polymorpha* forest, with *Cheirodendron* sp. or *Dicranopteris linearis* as co-dominant species (Wood and Perlman 1993; HINHP Database 1999). Plants growing in association with this species include *Dubautia* sp., *Cryptocarya mannii, Sadleria pallida* (amau), *Myrsine* sp., *Syzygium sandwicensis, Machaerina angustifolia, Freycinetia arborea, Hedyotis terminalis, Cheirodendron* sp., *Bobea brevipes, Nothocestrum* sp. (aiae), *Melicope* sp., *Eurya sandwicensis* (anini), *Psychotria* sp., *Lysimachia* sp. (kolokolo kuahiwi), and native ferns (61 FR 53070; HINHP Database 1999; K. Wood, *in litt.* 1999).

Competition with alien plants, such as *Erigeron karvinskianus, Lantana camara, Rubus argutus, Psidium cattleianum, Rubus rosaefolius,* and *Kalanchoe pinnata,* and habitat degradation by feral pigs and goats are the major threats to *Myrsine linearifolia* (61 FR 53070).

Nothocestrum peltatum

Nothocestrum peltatum, a member of the nightshade family (Solanaceae), is a small tree with ash-brown bark and woolly stems. The usually peltate leaves and shorter leaf stalks separate this species from others in the genus (Symon 1999).

Although plants of this long-lived perennial species have been observed flowering, they rarely set fruit. This could be the result of a loss of pollinators, reduced genetic variability, or an inability to fertilize itself (59 FR 9304). Little else is known about the life history of *Nothocestrum peltatum.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown.

Historically, *Nothocestrum peltatum* was known from Kauai at Kumuwela, Kaholuamanu, and the region of Nualolo (HINHP Database 1999). This species is now known from a total of nine populations with 19 individuals, located near the Kalalau Lookout area, Kalalau Valley, Awaawapuhi and Makaha Valleys, Waimeae Canyon, Nualolo, and Kawaiula, all on State owned land; the species may occur on or near land under Federal jurisdiction in Kokee State Park (HINHP Database 1999; GDSI 1999; K. Wood, *in litt.* 1999).

This species generally grows in rich soil on steep slopes in montane mesic or lowland mesic or wet forest dominated by *Acacia koa* or a mixture of *Metrosideros polymorpha* and *A. koa* between 915 and 1,220 m (3,000 and 4,000 ft) elevation. Associated plants include *Antidesma* sp., *Dicranopteris linearis, Bobea brevipes, Elaeocarpus bifidus, Alphitonia ponderosa, Melicope anisata, M. barbigera, M. haupuensis, Pouteria sandwicensis, Dodonaea viscosa, Dianella sandwicensis, Tetraplasandra kauaiensis, Claoxylon sandwicensis, Cheirodendron trigynum, Psychotria mariniana, P. greenwelliae, Hedyotis terminalis, Ilex anomala, Xylosma* sp., *Cryptocarya mannii, Coprosma* sp., *Pleomele aurea, Diplazium sandwicensis, Broussaisia arguta,* and *Perrottetia sandwicensis* (Sohmer and Gustafson 1987; HINHP Database 1999; K. Wood, *in litt.* 1999).

Competition with alien plants, such as *Passiflora mollissima, Lantana camara, Rubus argutus,* and *Erigeron karvinskianus,* and habitat degradation by feral pigs, deer, and red jungle fowl (*Gallus gallus*) constitute the major threats to *Nothocestrum peltatum.* This species is also threatened by fire, risk of extinction from naturally occurring events (*e.g.,* landslides or hurricanes), and reduced reproductive vigor due to the small number of existing individuals (59 FR 9304; HINHP Database 1999).

Panicum niihauense

Panicum niihauense, a member of the grass family (Poaceae), is a perennial bunchgrass with unbranched culms (aerial stems). This short-lived perennial species is distinguished from others in the genus by the shape of the inflorescence branches, which are erect, and the arrangement of the spikelets, which are densely clustered (Davids 1999).

Little is known about the life history of this species. Reproductive cycles, longevity, specific environmental requirements, and limiting factors are unknown.

Panicum niihauense was known historically from Niihau and one location on Kauai (HINHP Database 1999). Currently this species is only known from the Polihale State Park area on State and privately owned land, and may occur on or near the federally owned Pacific Missile Range Facility (PMRF) on Kauai (GDSI 1999). The single population of 23 individuals is found scattered in sand dunes in a coastal shrubland at elevations of 100 m (330 ft) or less (HINHP Database 1999). Associated plant taxa include *Dodonaea viscosa, Cassytha filiformis* (kaunaoa pehu), *Sporobolus* sp., *Scaevola sericea* (naupaka kahakai), *Sida fallax,* and *Vitex rotundifolia* (kolokolo kahakai) (HINHP Database 1999).

Primary threats to *Panicum niihauense* are destruction by off-road vehicles, competition with alien plant taxa, 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 (61 FR 53108; HINHP Database 1999).

Phyllostegia knudsenii

Phyllostegia knudsenii, a 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).

No life history information for this species is currently available.

Until 1993, *Phyllostegia knudsenii* was only known from the site of its original discovery made in the 1800s from the woods of Waimeae on Kauai (Sherff 1935; HINHP Database 1999; Wagner *et al.* 1999). There are currently two known populations with a total of 8 to 17 individuals on State owned land in Koaie Canyon (HINHP Database 1999; GDSI 1999; K. Wood, in litt. 1999).

Phyllostegia knudsenii is found in *Metrosideros polymorpha* lowland mesic or wet forest between 865–975 m elevation (2,840–3,200 ft) (HINHP Database 1999). Associated species include *Perrottetia sandwicensis, Cyrtandra kauaiensis* (hai wale), *Cyrtandra paludosa* (hai wale), *Elaeocarpus bifidus, Claoxylon sandwicensis, Cryptocarya mannii, Ilex anomala, Myrsine linearifolia, Bobea timonioides, Selaginella arbuscula* (lepelepeamoa), *Diospyros sp., Zanthoxylum dipetalum, Pittosporum* sp., *Tetraplasandra* sp., *Pouteria sandwicensis,* and *Pritchardia minor* (61 FR 53070).

Major threats to *Phyllostegia knudsenii* include habitat degradation by feral pigs and goats, competition with alien 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; USFWS 1998a).

Phyllostegia wawrana

Phyllostegia wawrana, a 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 (USFWS 1998a). No additional life history information for this species is currently available.

Phyllostegia wawrana was reported to be found at Hanalei on Kauai in the 1800s and along Kokee Stream in 1926. Currently, populations are reported in the Makaleha Mountains, Honopu Valley, and Hanakoa Valley. A total of four populations with 29–49 individuals are found on State and privately owned lands. In addition, this species may occur on or near land under Federal jurisdiction in Kokee State Park (HINHP Database 1999; GDSI 1999).

This species grows between 780 and 1,200 m elevation (2,560 to 3,940 ft) in *Metrosideros polymorpha*-dominated lowland or montane wet or mesic forest with *Cheirodendron* sp. or *Dicranopteris linearis* as co-dominant species (HINHP Database 1999). Associated species include *Delissea rivularis, Diplazium sandwichianum, Vaccinium* sp., *Broussaisia arguta, Myrsine lanaiensis, Psychotria* sp., *Dubautia knudsenii, Scaevola procera* (naupaka kuahiwi), *Gunnera* sp., *Pleomele aurea, Claoxylon sandwicense, Elaphoglossum* sp., *Hedyotis* sp., *Sadleria* sp., and *Syzygium sandwicensis* (61 FR 53070; HINHP Database 1999).

Major threats to *Phyllostegia wawrana* include habitat degradation by feral pigs and competition with alien plant species, such as *Rubus rosaefolius, Passiflora mollissima, Rubus argutus, Melastoma candidum, Erigeron karvinskianus,* and *Erechtites valerianefolia* (61 FR 53070; USFWS 1998a).

Poa mannii

Poa mannii, a member of the grass family (Poaceae), is a perennial grass with short rhizomes (underground stems) and erect, tufted culms. All three native species of *Poa* in the Hawaiian Islands are endemic to the island of Kauai. *Poa mannii* is distinguished from both *P. siphonoglossa* and *P. sandvicensis* by its fringed ligule and from *P. sandvicensis* by its shorter panicle branches (O'Connor 1999).

Little is known about the life history of *Poa mannii.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown.

Historically, this species was found in Olokele Gulch on Kauai (O'Connor 1999). Currently, there is a total of six populations with 163–168 individuals on State owned land in Kalalau Valley, Makaha Valley, Koaie Valley, and Waialae Valley (HINHP Database 1999; GDSI 1999; K. Wood, *in litt.* 1999).

This species typically grows on cliffs, rock faces, or stream banks in lowland or montane wet, mesic, or dry *Metrosideros polymorpha* forests or *Acacia koa-M. polymorpha* montane mesic forest at elevations between 460 and 1,150 m (1,510 and 3,770 ft). Associated species include *Chamaesyce celastroides* var. *hanapepensis, Artemisia australis, Bidens sandwicensis, Lobelia sandwicensis* (NCN), *Wilkesia gymnoxiphium, Eragrostis variabilis, Panicum lineale, Mariscus phloides* (NCN), *Luzula hawaiiensis* (NCN), *Carex meyenii, C. wahuensis* (NCN), *Cyrtandra wawrae* (haiwale), *Exocarpos luteolus, Labordia helleri* (kamakahala), *Nototrichium* sp., *Hedyotis terminalis, Melicope anisata, M. barbigera, M. pallida, Pouteria sandwicensis, Schiedea membranacea, Diospyros sandwicensis, Psychotria mariniana, P. greenwelliae, Kokia kauaiensis, Alectryon macrococcus, Antidesma platyphyllum, Bidens cosmoides, Dodonaea viscosa,* and *Schiedea amplexicaulis* (NCN) (59 FR 56330; HINHP Database 1999; K. Wood, *in litt.* 1999).

Poa mannii survives only in very steep areas that are inaccessible to goats, suggesting that goat herbivory may have eliminated this species from more accessible locations, as is the case for other rare plants from northwestern Kauai. Threats to *P. mannii* include habitat damage, trampling, and browsing by feral goats, and competition with invasive alien plants. *Erigeron karvinskianus* has invaded Kalalau, Koaie, and Waialae Valleys, three of the areas where *P. mannii* occurs. *Lantana camara* threatens all known populations, and *Rubus argutus* threatens the populations in Kalalau and Waialae Valleys. *Poa mannii* is also threatened by fire, and reduced reproductive vigor and/or extinction from naturally occurring events, such as landslides or hurricanes, due to the small number of existing populations and individuals (59 FR 56330).

Poa sandvicensis

Poa sandvicensis is a perennial grass (family Poaceae) with densely tufted, mostly erect culms. *Poa sandvicensis* is distinguished from closely related species by its shorter rhizomes, shorter culms which do not become rush-like with age, closed and fused sheaths, relatively even-edged ligules, and longer panicle branches (O'Connor 1999).

Little is known about the life history of *Poa sandvicensis.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown.

Historically, this species was known from six areas on the island of Kauai: the rim of Kalalau Valley in Na Pali Coast State Park; Halemanu and Kumuwela Ridges and Kauaikanana drainage in Kokee State Park; Awaawapuhi Trail in Na Pali-Kona Forest Reserve; Kohua Ridge/Mohihi drainage in both the Forest Reserve and Alakai Wilderness Preserve; and Kaholuamanu (57 FR 20580; Hitchcock 1922; HINHP Database 1999). Hillebrand's (1888) questionable reference to a Maui locality is most likely an error (57 FR 20580; Hitchcock 1922). Currently, there is a total of nine populations with 1,841 individuals occurring on State and privately owned lands (GDSI 1999; HINHP Database 1999; K. Wood, *in litt.* 1999). *Poa sandvicensis* is known to be extant at the rim of Kalalau Valley in Na Pali Coast State Park; Awaawapuhi Trail, Kumuwela Ridge and Kauaikanana drainage in Kokee State Park; and Kohua Ridge and Mohihi drainage (HINHP Database 1999).

Poa sandvicensis grows on wet, shaded, gentle to usually steep slopes, ridges, and rock ledges in semi-open to closed, mesic to wet, diverse montane forest dominated by *Metrosideros polymorpha*, at elevations of 1,035 to 1,250 m (3,400 to 4,100 ft) (HINHP Database 1999). Associated native species include *Dodonaea viscosa, Dubautia* sp., *Coprosma* sp., *Melicope* sp., *Dianella sandwicensis, Alyxia olivaeformis, Bidens* sp., *Dicranopteris linearis, Schiedea stellarioides, Peperomia macraeana, Claoxylon sandwicense, Acacia koa, Psychotria* sp., *Hedyotis* sp., *Scaevola* sp., *Cheirodendron* sp., and *Syzygium sandwicensis* (57 FR 20580; HINHP Database 1999).

The greatest immediate threats to the survival of *Poa sandvicensis* are competition from alien plants, such as *Erigeron karvinskianus, Rubus argutus, Passiflora mollissima* and *Hedychium* sp.; erosion caused by feral pigs and goats; and State forest reserve trail maintenance activities and human recreation. In addition, naturally occurring events could constitute a threat of extinction or reduced reproductive vigor due to the species'

small population size with its limited gene pool (57 FR 20580; USFWS 1995).

Poa siphonoglossa

Poa siphonoglossa is a perennial grass (family Poaceae). It differs from *P. sandvicensis* principally by its longer culms, lack of a prominent tooth on the ligule, and shorter panicle branches. *Poa siphonoglossa* has extensive tufted and flattened culms that cascade from banks in masses. Short rhizomes, long culms, closed and fused sheaths, and lack of a tooth on the ligule separate *P. siphonoglossa* from *P. mannii* and other closely related species (O'Connor 1999).

Little is known about the life history of *Poa siphonoglossa.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown.

Historically, *Poa siphonoglossa* was known from five sites on the island of Kauai: Kohua Ridge in Na Pali-Kona Forest Reserve; near Kaholuamanu; Kaulaula Valley in Puu Ka Pele Forest Reserve; Kuia Valley; and Kalalau (HINHP Database 1999). Currently, there are a total of five populations with 50 individuals on State owned land in three of these historic areas: Kohua Ridge, Kuia Valley, and Kalalau (HINHP Database 1999; GDSI 1999; K. Wood, *in litt.* 1999).

Poa siphonoglossa typically grows on shady banks near ridge crests in mesic *Metrosideros polymorpha* forest between about 1,000 to 1,200 m (3,280 and 3,940 ft) elevation (Hitchcock 1922; HINHP Database 1999). Associated species include native species such as *Acacia koa, Psychotria* sp., *Scaevola* sp., *Alphitonia ponderosa, Zanthoxylum dipetalum, Tetraplasandra kauaiensis, Dodonaea viscosa, Hedyotis* sp., *Melicope* sp., *Vaccinium* sp., *Styphelia tameiameiae, Carex meyenii, C. wahuensis*, and *Wilkesia gymnoxiphium* (57 FR 20580).

The primary threat to the survival of *Poa siphonoglossa* is habitat degradation and/or herbivory by feral pigs and deer. The alien plant *Rubus argutus* invading Kohua Ridge constitutes a probable threat to that population (HINHP Database 1999). A limited gene pool and potential for one disturbance event to destroy the majority of known individuals are also serious threats to this species (57 FR 20580; USFWS 1995).

Pritchardia aylmer-robinsonii

Pritchardia aylmer-robinsonii of the palm family (Arecaceae) is a fan-leaved tree about 7 to 15 m (23 to 50 ft) tall. This species is distinguished from others of the genus by the thin leaf texture and drooping leaf segments, tan woolly hairs on the underside of the petiole and the leaf blade base, stout hairless flower clusters that do not extend beyond the fan-shaped leaves, and the smaller spherical fruit (Read and Hodel 1999).

Historically, *Pritchardia aylmer-robinsonii* was found at three sites in the eastern and central portions of the island of Niihau. Trees were found on Kaali Cliff and in Mokouia and Haao Valleys at elevations between 70 and 270 m (230 and 885 ft) on privately owned land (HINHP Database 1999; GDSI 1999). The most recent observations indicate that two plants still remain on Kaali Cliff (Read and Hodel 1999).

The substrate in the seepage area where this species currently occurs is rocky talus (HINHP Database 1999). Native plants that have been found in the area include *Brighamia insignis, Cyperus trachysanthos, Lipochaeta lobata* var. *lobata* (nehe), and *Lobelia niihauensis* (HINHP Database 1999). Originally a component of the coastal dry forest, this species now occurs only in a rugged and steep area where it receives some protection from grazing animals (61 FR 41020).

The species is threatened by habitat degradation and/or herbivory by cattle, feral pigs, and goats and seed predation by rats. Small population size, limited distribution, and reduced reproductive vigor makes this species particularly vulnerable to extinction (61 FR 41020).

Pritchardia napaliensis

Pritchardia napaliensis, a member of the palm family (Arecaceae), is a small palm with about 20 leaves and an open crown. This species is distinguished from others of the genus that grow on Kauai by having about 20 flat leaves with pale scales on the lower surface that fall off with age, inflorescences with hairless main axes, and globose fruits less than 3 cm (1.2 in.) long (Read and Hodel 1999).

No life history information for this species is currently available.

Pritchardia napaliensis is known from four populations with 159–179 individuals on State owned land in Hoolulu and Waiahuakua Valleys in the Hono O Na Pali NAR and Alealau in Kalalau Valley (within or close to the boundaries of Hono O Na Pali NAR and Na Pali Coast State Park), Kauai (HINHP Database 1999; GDSI 1999; K. Wood *in litt.* 1999).

Pritchardia napaliensis typically grows in areas from 150 to about 1,160 m (500 to about 3,800 ft) elevation in a wide variety of habitats ranging from lowland dry to mesic forests dominated by *Diospyros* sp. or montane wet forests dominated by *Metrosideros polymorpha* and *Dicranopteris linearis* (61 FR 53070; HINHP Database 1999). Several associated plant species besides those mentioned above include *Rauvolfia sandwicensis, Elaeocarpus bifidus, Syzygium sandwicensis, Cibotium* sp., *Canthium odoratum, Vaccinium dentatum* (ohelo), *Dubautia knudsenii, Alsinidendron lychnoides, Poa sandvicensis, Phyllostegia electra* (NCN), *Stenogyne purpurea* (NCN), *Melicope peduncularis* (alani), *Pouteria sandwicensis, Lipochaeta connata* var. *acris* (nehe), *Nesoluma polynesicum* (keahi), *Santalum freycinetianum, Pteralyxia kauaiensis, Wilkesia gymnoxiphium, Boehmeria grandis, Pleomele* sp., *Psychotria* sp., *Cheirodendron trigynum*, and *Ochrosia* sp. (holei) (HINHP Database 1999).

Major threats to *Pritchardia napaliensis* include habitat degradation and grazing by feral goats and pigs; seed predation by rats; and competition with the alien plants, such as *Kalanchoe pinnata, Erigeron karvinskianus, Lantana camara, Psidium guajava*, and possibly *Cordyline fruticosa*. The species is also threatened by vandalism and over-collection. In 1993 near the Wailua River, the Hawaiian Department of Fish and Wildlife (DOFAW) constructed a fenced enclosure around 39 recently planted *P. napaliensis* individuals. Shortly after being planted, the fence was vandalized and the 39 plants were removed (A. Kyono, pers. comm. 2000; Craig Koga, DOFAW, *in litt.* 1999). Also, because of the small number of remaining populations and individuals, this species is susceptible to a risk of extinction from naturally occurring events, such as landslides or hurricanes, and from reduced reproductive vigor (61 FR 53070).

Pritchardia viscosa

Pritchardia viscosa, a member of the palm family (Arecaceae), is a small palm 3 to 8 m (10 to 26 ft) tall. This species differs from others of the genus that grow on Kauai by the degree of hairiness of the lower surface of the leaves and main axis of the flower cluster, and length of the flower cluster (Read and Hodel 1999).

Historically, *Pritchardia viscosa* was known only from a 1920 collection from Kalihiwai Valley on the island of Kauai (HINHP Database 1999). It was not seen again until 1987, when Robert Read observed it in the same general area as the type locality, off the Powerline Road at 510 m (1,680 ft) elevation (61 FR 53070; HINHP Database 1999). Currently, there is one population with three individuals on privately owned

land (HINHP Database 1999; GDSI 1999).

The plants are found in a *Metrosideros polymorpha-Dicranopteris linearis* lowland wet forest with *Nothocestrum* sp., *Bobea* sp., *Antidesma* sp., *Cibotium* sp., and *Psychotria* sp. (61 FR 53070).

Psidium cattleianum and alien grasses, such as *Paspalum conjugatum*, are major threats to *Pritchardia viscosa* because these alien plants are effective competitors for space, light, nutrients, and water. Rats eat the fruit of *Pritchardia viscosa* and are, therefore, a serious threat to the reproductive success of this species. At least one of the remaining mature trees has been damaged by spiked boots used either by a botanist or seed collector to scale the tree. In mid-1996, a young plant and seeds from mature *Pritchardia viscosa* plants were removed from the only known location of this species. Because of this past activity, it is reasonable to assume that these plants are threatened by over-collection and vandalism (A. Kyono, pers. comm. 2000; C. Koga, *in litt.* 1999). Also, because of the small numbers of individuals in the only known population, this species is susceptible to extinction since a single naturally occurring event (e.g., a hurricane) could destroy all remaining plants (61 FR 53070).

Pteralyxia kauaiensis

Pteralyxia kauaiensis, a member of the dogbane family (Apocynaceae), is a long-lived perennial tree 3 to 8 m (10 to 26 ft) tall. The leaves are dark green and shiny on the upper surfaces, but pale and dull on the lower surfaces. This species differs from the only other taxa of this endemic Hawaiian genus in having reduced lateral wings on the seed (Lamb 1981; St. John 1981; Wagner *et al.* 1999).

Little is known about the life history of *Pteralyxia kauaiensis.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown.

Historically, *Pteralyxia kauaiensis* was known from the Wahiawa Mountains in the southern portion of Kauai (HINHP Database 1999). This species is now known from 20 populations, with a total of 478–505 individuals in the following scattered locations on private, State lands, and perhaps on or near Federal land: Mahanaloa-Kuia Valley in Kuia NAR; Haeleele Valley; Na Pali Coast State Park; Limahuli Valley; the Koaie branch of Waimeae Canyon; Haupu Range; Wailua River; and Moloaa Forest (59 FR 9304; Wagner *et al.* 1999; HINHP Database 1999; K. Wood, *in litt.* 1999). There is also an undocumented sighting of one individual at Makaleha, above the town of Kapaa (59 FR 9304).

This taxon is typically found in diverse mesic or wet forests at an elevation of 250 to 610 m (820 to 2,000 ft) (Wagner *et al.* 1999). Associated species include *Acacia koa, Alphitonia ponderosa, Antidesma* sp., *Alectryon macrococcus, Bobea timonioides, Canthium odoratum, Cyanea* sp., *Caesalpinia kauaiensis* (uhiuhi), *Carex* sp., *Charpentiera elliptica, Claoxylon sandwicense, Delissea* sp. (NCN), *Dodonaea viscosa, Dianella sandwicensis, Diplazium sandwichianum, Diospyros* sp., *Euphorbia haeleeleana, Freycinetia arborea, Gardenia remyi* (nanu), *Gahnia* sp., *Hedyotis terminalis, Hibiscus* sp., *Kokia kauaiensis, Metrosideros polymorpha, Myrsine lanaiensis, Nesoluma polynesicum, Neraudia kauaiensis, Nestegis sandwicensis, Pisonia sandwicensis* (papala kepau), *Peperomia macraeana, Poa sandwicensis, Pipturus* sp., *Pouteria sandwicensis, Pritchardia* sp., *Psychotria mariniana, Pleomele* sp., *Rauvolfia sandwicensis, Syzygium sandwicensis, Schiedea stellarioides, Styphelia tameiameiae, Santalum freycinetianum, Tetraplasandra* sp., *Xylosma hawaiiense* (maua), and *Zanthoxylum dipetalum* (59 FR 9304; HINHP Database 1999).

The major threats to *Pteralyxia kauaiensis* are habitat destruction by feral animals and competition with introduced plants. Animals affecting the survival of this species include feral goats and pigs, and, possibly, rats, which may eat the fruit. Fire could threaten some populations. Introduced plants competing with this species include *Psidium guajava, Erigeron karvinskianus, Aleurites moluccana, Lantana camara, Psidium cattleianum*, and *Cordyline fruticosa* (59 FR 9304; USFWS 1995; HINHP Database 1999).

Remya kauaiensis

Remya kauaiensis, one of three species of a genus endemic to the Hawaiian Islands, is in the aster family (Asteraceae). *Remya kauaiensis* is a small short-lived perennial shrub, about 90 cm (3 ft) tall, with many slender, sprawling branches which are covered with a fine tan fuzz near their tips. The leaves, coarsely toothed along the edges, are green on the upper surface while the lower surface is covered with a dense mat of fine white hairs (Wagner *et al.* 1999).

Seedlings of this taxon have not been observed. Flowers have been observed in April, May, June, and August, and are probably insect-pollinated. Seeds are probably wind or water-dispersed. *Remya kauaiensis* may be self-incompatible (56 FR 1450; Herbst 1988; USFWS 1995).

Historically, this species was found in the Na Pali Kona Forest Reserve at Koaie, Mohihi, Kalalau, Makaha, Nualolo, Kawaiula, Kuia, Honopu, Awaawapuhi, Kopakaka, and Kauhao, on Kauai (HINHP Database 1999). There are currently 14 known populations with a total of 78–86 individuals on State owned land (HINHP Database 1999; GDSI 1999; K. Wood, *in litt.* 1999). One known population of *Remya kauaiensis* grows on the steep cliffs below the rim of Kalalau Valley, which, although at the edge of a mesic forest, receives considerably more moisture than do the other populations of the species (56 FR 1450). Other populations are scattered throughout the drier ridges of Northwest Kauai and in Waimeae Canyon (HINHP Database 1999; K. Wood, *in litt.* 1999).

Remya kauaiensis grows chiefly on steep, north or northeast-facing slopes between 850 to 1,250 m (2,800 to 4,100 ft) in elevation. It is found primarily in *Acacia koa-Metrosideros polymorpha* lowland mesic forest with *Chamaesyce* sp. (akoko), *Nestegis sandwicensis, Diospyros* sp., *Hedyotis terminalis, Melicope* sp., *Pouteria sandwicensis, Schiedea membranacea, Psychotria mariniana, Dodonaea viscosa, Dianella sandwicensis, Tetraplasandra kauaiensis*, and *Claoxylon sandwicensis* (56 FR 1450; Herbst 1988; HINHP Database 1999).

The primary threats to *Remya kauaiensis* include herbivory and habitat degradation by feral goats, pigs, cattle, and deer, and competition from alien plant species. Other threats include erosion, fire, and risk of extinction from naturally occurring events, such as landslides or hurricanes, and/or reduced reproductive vigor due to the small number of remaining populations and individuals (56 FR 1450; USFWS 1995).

Remya montgomeryi

The genus *Remya,* in the aster family (Asteraceae), is endemic to the Hawaiian Islands. *Remya montgomeryi* was discovered in 1985 by Steven Montgomery on the sheer, virtually inaccessible cliffs below the upper rim of Kalalau Valley, Kauai. It is a small short-lived perennial shrub, about 90 cm (3 ft) tall, with many slender, sprawling to weakly erect, smooth branches. The leaves are coarsely toothed along the edges, and are green on the upper as well as lower surfaces (Wagner *et al.* 1999).

Seedlings of this taxon have not been observed. Flowers have been observed in April, May, June, and August, and are probably insect-pollinated. Seeds are probably wind or water-dispersed. *Remya montgomeryi* may be self-incompatible (56 FR 1450; Herbst 1988).

Remya montgomeryi is known only from Kauai. Three populations with 143 individuals are reported on State owned land on the rim of Kalalau Valley and Koaie Canyon. This species may also occur on or near land under Federal jurisdiction in Kokee State Park (Herbst 1988; GDSI 1999; HINHP Database 1999; K. Wood, *in litt.* 1999).

Remya montgomeryi grows between elevation of 850 to 1,250 m (2,800 to 4,100 ft), primarily on steep, north or northeast-facing slopes or stream banks near waterfalls in *Metrosideros polymorpha* mixed mesic forest and cliffs. Associated plants include *Lysimachia glutinosa, Lepidium serra, Boehmeria grandis, Poa mannii, Stenogyne campanulata, Myrsine linearifolia, Bobea timonioides, Ilex anomala, Zanthoxylum dipetalum, Claoxylon sandwicensis, Tetraplasandra* sp., *Artemisia* sp., *Nototrichium* sp., *Cyrtandra* sp., *Dubautia plantaginea* (na ena e), *Sadleria* sp., *Cheirodendron* sp., *Scaevola* sp., and *Pleomele* sp. (HINHP Database 1999; K. Wood, *in litt.* 1999).

The primary threats to *Remya montgomeryi* are herbivory and habitat degradation by feral goats, pigs, cattle, and deer, and competition from alien plant species. Other threats include erosion, fire, and an increased risk of extinction from naturally occurring events (e.g., landslides or hurricanes) by virtue of the extremely small size of the populations and their limited distribution. The limited gene pool may depress reproductive vigor, or a single environmental disturbance could destroy a significant percentage of the known individuals (56 FR 1450; USFWS 1995).

Schiedea apokremnos

Schiedea apokremnos is a low, branching short-lived perennial shrub 20 to 50 cm (8 to 20 in.) tall, of the pink family (Caryophyllaceae). The leaves are oppositely arranged, oblong, and somewhat fleshy and glabrous. *Schiedea apokremnos* is distinguished from related species by shorter sepals, nectaries, and capsules (Wagner *et al.* 1999).

Little is known about the life history of *Schiedea apokremnos.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown.

Schiedea apokremnos has been collected from Nualolo Kai, Kaaweiki Ridge, and along a 10.5 km (6.5 mi) long section of the Na Pali coast including Milolii Valley, Kalalau Beach, Kaaalahina and Manono ridges, Haeleele ridge, and, as far north as, Pohakuao Valley, all on the island of Kauai (HINHP Database 1999). Currently, the species is extant at all locations except Nualolo Kai, although the Kalalau and Milolii populations have not been revisited for over six years. The Kaaweiki population is in Puu Ka Pele Forest Reserve and the Haeleele ridge population is in Polihale State Park, while all others are in Na Pali Coast State Park (56 FR 49639). There is currently a total of five populations containing 311 to 1,251 individuals on State owned lands (HINHP Database 1999; GDSI 1999).

Schiedea apokremnos grows in the crevices of near-vertical coastal cliff faces, from 60 to 330 m (200 to 1,080 ft) in elevation. The species grows in sparse dry coastal shrub vegetation along with *Heliotropium* sp. (ahinahina), Bidens sp., *Artemisia australis, Lobelia niihauensis, Wilkesia hobdyi, Lipochaeta connata, Myoporum sandwicense, Canthium odoratum, Peperomia* sp. and *Chamaesyce* sp. (56 FR 49639; HINHP Database 1999).

The restriction of this species to inaccessible cliffs suggests that goat herbivory may have eliminated them from more accessible locations. The greatest current threat to the survival of *Schiedea apokremnos* is still herbivory and habitat degradation by feral goats, as well as competition from the alien plants *Leucaena leucocephala* (koa haole) and *Hyptis pectinata* (comb hyptis), and trampling (trails) by humans. Given the small size of most populations, restricted distribution, and limited gene pool, depressed reproductive vigor may be serious threats to the species. Some *S. apokremnos* individuals are functionally female and must be cross-pollinated to set seed. This reproductive strategy may be ineffective in populations with few individuals (56 FR 49639; USFWS 1995). In addition, a single environmental disturbance (such as a landslide or fire) could destroy a significant percentage of the extant individuals.

Schiedea helleri

Schiedea helleri, a member of the pink family (Caryophyllaceae), is a short-lived perennial vine. The stems, smooth below and minutely hairy above, are usually prostrate and at least 15 cm (6 in.), long with internodes at least 4 to 15 cm (1.6 to 6 in.) long. The opposite leaves are somewhat thick, triangular, egg-shaped to heart-shaped, conspicuously three-veined, and nearly hairless to sparsely covered with short, fine hairs, especially along the margins. This species is the only member of the genus on Kauai that grows as a vine (Wagner *et al.* 1999).

Three plants were observed flowering in February (USFWS 1998a). No additional life history information for this species is currently available.

Schiedea helleri was originally found only at a single location above Waimeae, at Kaholuamano on the island of Kauai, over 100 years ago (HINHP Database 1999). In 1993, this species was discovered on a steep wall above a side stream off Mohihi Stream, approximately 5.6 km (3.5 mi) north of the original location (61 FR 53070). Recently, a small population was discovered along the Mohihi-Waialeale Trail, and plants were found in Nawaimaka Valley (HINHP Database 1999; K. Wood, *in litt.* 1999). There is currently a total of two populations with 53–63 individuals on State owned land (HINHP Database 1999; GDSI 1999; K. Wood, *in litt.* 1999).

Schiedea helleri is found on ridges and steep cliffs in closed *Metrosideros polymorpha-Dicranopteris linearis* montane wet forest, *M. polymorpha-Cheirodendron* sp. montane wet forest, or *Acacia koa-M. polymorpha* montane mesic forest between 1,065–1,100 m (3,490–3,610 ft) elevation (HINHP Database 1999; K. Wood, *in litt.* 1999). Other native plants growing in association with this species include *Dubautia raillardioides* (na ena e), *Scaevola procera, Hedyotis terminalis, Syzygium sandwicensis, Melicope clusifolia, Cibotium* sp., *Broussaisia arguta, Cheirodendron* sp., *Cyanea hirtella* (haha), *Dianella sandwicensis, Viola wailenalenae* (pamakani), and *Poa sandvicensis* (HINHP Database 1999; K. Wood, *in litt.* 1999).

Competition with the noxious alien plant *Rubus argutus* and a risk of extinction from naturally occurring events (e.g., landslides or hurricanes) and reduced reproductive vigor due to the small number of extant individuals, are serious threats to *Schiedea helleri* (61 FR 53070).

Schiedea kauaiensis

Schiedea kauaiensis, a member of the pink family (Caryophyllaceae), is a generally hairless, erect subshrub. The green, sometimes purple-tinged leaves are opposite, narrowly egg-shaped or lance-shaped to narrowly or broadly elliptic. Lacking petals, the perfect flowers are borne in open branched inflorescences, and are moderately

covered with fine, short, curly, white hairs. This short-lived perennial species is distinguished from others in this endemic Hawaiian genus by its habit, larger leaves, the hairiness of the inflorescence, the number of flowers in each inflorescence, larger flowers, and larger seeds (Wagner *et al.* 1999).

Little is known about the life history of this taxon. Fruit and flowers have been observed in July and August, and flowering material has been collected in September (USFWS 1998a). There is no evidence of regeneration from seed under field conditions. Reproductive cycles, longevity, specific environmental requirements and limiting factors are unknown.

Historically, *Schiedea kauaiensis* was known from the northwestern side of Kauai, from Papaa to Mahanaloa. It was thought to be extinct until the two currently known populations in Mahanaloa and Kalalau Valleys, with a total of 18 individuals, were found (HINHP Database 1999; K. Wood, *in litt.* 1999). Both populations occur on State land—the Mahanaloa Valley population within Kuia NAR and the Kalalau Valley population within Na Pali Coast State Park (GDSI 1999; HINHP Database 1999; K. Wood, *in litt.* 1999).

Schiedea kauaiensis typically grows in diverse mesic to wet forest on steep slopes between 680–790 m elevation (2,230–2,590 ft) (HINHP Database 1999). Associated plant taxa include *Psychotria mariniana, P. hexandra, Canthium odoratum, Pisonia* sp., *Microlepia speluncae* (NCN), *Exocarpos luteolus, Diospyros* sp., *Peucedanum sandwicense,* and *Euphorbia haeleeleana* (61 FR 53108; HINHP Database 1999).

Threats to *Schiedea kauaiensis* include habitat degradation and/or destruction by feral goats, pigs, and cattle; competition from several alien plant taxa; predation by introduced slugs and snails; and a risk of extinction from naturally occurring events, such as landslides or hurricanes, and/or reduced reproductive vigor due to the low number of individuals in only two known populations. *Schiedea kauaiensis* is also potentially threatened by fire (61 FR 53108; USFWS 1998a; HINHP Database 1999).

Schiedea membranacea

Schiedea membranacea, a member of the pink family (Caryophyllaceae), is a perennial herb. The unbranched, fleshy stems rise upwards from near the base and are somewhat sprawling. During dry seasons, the plant dies back to a woody, short stem at or beneath the ground surface. The oppositely arranged leaves are broadly elliptic to egg-shaped, generally thin, have five to seven longitudinal veins, and are sparsely covered with short, fine hairs. The perfect flowers have no petals, are numerous, and occur in large branched clusters. This short-lived perennial species differs from others of the genus that grow on Kauai by having five-to seven-nerved leaves and a herbaceous habit (Wagner *et al.* 1999).

Plants marked in Mahanaloa Gulch on Kauai in 1987 were alive in 1997, despite Hurricane Iniki. However, there was no evidence of recruitment in the population, despite the production of abundant seed during all years of observation (1987, 1994–1997) (USFWS 1998a). Introduced snails have been observed feeding on flowers and developing seed capsules, and garlic snails (*Oxychilus alliarius*) were common near the plants. It seems very likely that introduced molluscs are responsible for the failure of recruitment. Under greenhouse conditions, this species, as well as other *Schiedea* species, is extremely sensitive to slugs and snails, further suggesting that the introduction of these alien species has had detrimental effects on *Schiedea* species in natural conditions. In addition, research suggests that this species largely requires outcrossing for successful germination and survival to adulthood (USFWS 1998a). Pollinators for *Schiedea membranacea* are unknown, since none have been seen during the daytime, and none were observed during one set of night observations (USFWS 1998a).

Schiedea membranacea is known from the western side of the island of Kauai, at Mahanaloa-Kuia, Paaiki, Kalalau, Nualolo, Wainiha, and Waialae Valleys (including Kuia NAR and Na Pali Coast State Park) (61 FR 53070; Wood and Perlman 1993; HINHP Database 1999). There is currently a total of nine populations containing 199–203 individuals, on State and privately owned lands. This species may also occur on or near land under Federal jurisdiction in Kokee State Park (HINHP Database 1999; GDSI 1999; K. Wood, *in litt.* 1999).

This species is typically found on cliffs and cliff bases in mesic or wet habitats, open to closed lowland, montane shrubland, or forest dominated by *Acacia koa, Pipturus* sp. or *Metrosideros polymorpha* between 520 and 1,160 m (1,700 and 3,800 ft) elevation. Associated native plants species include *Hedyotis terminalis, Melicope* sp., *Pouteria sandwicensis, Poa mannii, Hibiscus waimeae, Psychotria mariniana, Canthium odoratum, Pisonia sp., Perrottetia sandwicensis, Scaevola procera, Sadleria cyatheoides* (amau), *Diplazium sandwicensis, Thelypteris sandwicensis, Boehmeria grandis, Dodonaea viscosa, Myrsine* sp.,*Bobea brevipes, Alyxia olivaeformis, Psychotria greenwelliae, Pleomele* sp., *Alphitonia ponderosa, Joinvillea ascendens* ssp. *ascendens* (ohe), *Athyrium sandwicensis* (akolea), *Machaerina angustifolia, Cyrtandra paludosa, Touchardia latifolia, Thelypteris cyatheoides* (kikawaio), *Lepidium serra, Eragrostis variabilis, Remya kauaiensis, Lysimachia kalalauensis* (NCN), *Labordia helleri, Mariscus pennatiformis, Asplenium praemorsum* (NCN), and *Poa sandvicensis* (61 FR 53070; HINHP Database 1999).

Habitat degradation by feral goats, and pigs, and deer; competition with the alien plant species *Erigeron karvinskianus, Lantana camara, Rubus argutus, R. rosaefolius, Psidium cattleianum, Ageratina riparia* (Hamakua pamakani), and *Passiflora mollissima;* loss of pollinators; and landslides are the primary threats to *Schiedea membranacea.* Based on observations indicating that snails and slugs may consume seeds and seedlings, it is likely that introduced molluscs also represent a major threat to this species (61 FR 53070; Wood and Perlman 1993; USFWS 1998a).

Schiedea spergulina var. leiopoda and Schiedea spergulina var. spergulina

Schiedea spergulina, a member of the pink family (Caryophyllaceae), is a short-lived perennial subshrub. The opposite leaves are very narrow, one-veined, and attached directly to the stem. The flowers are unisexual, with male and female flowers on different plants. Flowers occur in compact clusters of three. The capsular fruits contain nearly smooth, kidney-shaped seeds. Of the 22 species in this endemic genus, only two other species have smooth seeds. *Schiedea spergulina* differs from those two in having very compact flower clusters. The two weakly defined varieties differ primarily in the degree of hairiness of the inflorescences, with *S. s.* var. *leiopoda* being the less hairy of the two (Wagner *et al.* 1999).

Little is known about the life histories of either *Schiedea spergulina* var. *leiopoda* or *Schiedea spergulina* var. *spergulina.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown.

Historically, *Schiedea spergulina* var. *leiopoda* was found on a ridge on the east side of Hanapepe on Kauai (HINHP Database 1999). One population with 35–50 individuals is now known to

grow in Lawai Valley on Kauai on privately owned land (HINHP Database 1999; GDSI 1999).

Schiedea spergulina var. *spergulina* was historically found in Olokele Canyon, but is now known only from Kalalau rim and Waimeae Canyon on Kauai. A total of three populations numbering over 200 individuals is reported on State and privately owned lands. However, it has been estimated that this species may number in the thousands on Kauai (USFWS 1995; HINHP Database 1999; GDSI 1999).

Both varieties of *Schiedea spergulina* are usually found on bare rock outcrops or sparsely vegetated portions of rocky cliff faces or cliff bases in diverse lowland mesic forest at elevations between 180 and 800 m (590 and 2,625 ft) (59 FR 9304; Wagner *et al.* 1999). Associated plants include *Bidens sandvicensis, Doryopteris* sp. (kumuniu), *Peperomia leptostachya* (ala ala wai nui), *Plectranthus parviflorus, Heliotropium* sp., and *Nototrichium sandwicense* (kului) (59 FR 9304; Lorence and Flynn 1991; USFWS 1995; HINHP Database 1999).

The major threats to *Schiedea spergulina* var. *leiopoda* are habitat destruction by feral goats and competition with alien plants such as *Leucaena leucocephala, Lantana camara,* and *Furcraea foetida* (Mauritius hemp). Individuals have also been damaged and destroyed by rock slides. This variety is potentially threatened by pesticide use in nearby sugarcane fields, as well as a risk of extinction from naturally occurring events (e.g., hurricanes) and/or reduced reproductive vigor due to the small number of existing individuals (59 FR 9304; Lorence and Flynn 1991; USFWS 1995).

Schiedea spergulina var. *spergulina* is threatened by competition with alien plant taxa, including *Erigeron karvinskianus, Lantana camara, Melia azedarach,* and *Triumfetta semitriloba* (Sacramento bur). The area in which this variety grows is used heavily by feral goats, and there is evidence that plants are being browsed and trampled (59 FR 9304; Lorence and Flynn 1991; HINHP Database 1999).

Schiedea stellarioides

Schiedea stellarioides, a member of the pink family (Caryophyllaceae), is a slightly erect to prostrate subshrub with branched stems. The opposite leaves are very slender to oblong-elliptic, and one-veined. This short-lived perennial species is distinguished from others of the genus that grow on Kauai by the number of veins in the leaves, shape of the leaves, presence of a leaf stalk, length of the flower cluster, and shape of the seeds (Wagner *et al.* 1999).

Plants were observed flowering in the field in February (USFWS 1995). No additional life history information for this species is currently available.

Historically, *Schiedea stellarioides* was found at the sea cliffs of Hanakapiai Beach, Kaholuamano-Opaewela region, the ridge between Waialae and Nawaimaka Valleys, and Haupu Range on the island of Kauai (HINHP Database 1999). This species is now found only at the ridge between Waialae and Nawaimaka Valleys on State land, just 0.8 kilometer (0.5 mile) northwest of the Kaholuamano-Opaewela region and in upper Kawaiiki (K. Wood, *in litt.* 1999; HINHP Database 1999). There is a total of two populations with 400 individuals on State owned land (HINHP Database 1999; K. Wood, *in litt.* 1999; GDSI 1999).

Schiedea stellarioides is found on steep slopes in closed *Acacia koa-Metrosideros polymorpha* lowland to montane mesic forest or shrubland between 610 and 1,120 m (2,000 and 3,680 ft) elevation. Associated plant species include *Nototrichium* sp., Artemisia sp., *Dodonaea viscosa, Melicope* sp., *Dianella sandwicensis, Bidens cosmoides, Mariscus* sp., and *Styphelia tameiameiae* (61 FR 53070; HINHP Database 1999).

The primary threats to this species include habitat degradation and herbivory by feral pigs and goats, competition with the alien plants *Melinis minutiflora* and *Rubus argutus,* and a risk of extinction of the two remaining population from naturally occurring events, such as landslides or hurricanes (61 FR 53070).

Stenogyne campanulata

Stenogyne campanulata, a member of the mint family (Lamiaceae), is described as a vine with four-angled, hairy stems. A short-lived perennial species, *Stenogyne campanulata* is distinguished from closely related species by its large and very broadly bell-shaped calyces that nearly enclose the relatively small, straight corollas, and by small calyx teeth that are half as long as wide (Weller and Sakai 1999).

Little is known about the life history of *Stenogyne campanulata.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown.

Stenogyne campanulata is known from one to three populations with 22–32 individuals which were originally discovered on the cliffs of Kalalau to below Puu o Kila, on State-owned land in the Na Pali Coast State Park (GDSI 1999; HINHP Database 1999).

Stenogyne campanulata grows on the rock face of a nearly vertical, north-facing cliff in diverse lowland or montane mesic forest at an elevation of 1,085 m (3,560 ft). The associated shrubby vegetation includes native species such as *Heliotropium* sp., *Lepidium serra, Lysimachia glutinosa, Perrottetia sandwicensis,* and *Remya montgomeryi* (57 FR 20580; Weller and Sakai 1999).

The restriction of this species to virtually inaccessible cliffs suggests that herbivory by feral goats may have eliminated it from more accessible locations. Goat herbivory and habitat degradation remain the primary threat. Feral pigs have disturbed vegetation in the vicinity of these plants. Erosion caused by feral goats or pigs exacerbates the potential threat of landslides. *Erigeron karvinskianus* and *Rubus argutus* are the primary alien plants threatening *Stenogyne campanulata.* The small number of individuals and its restricted distribution are serious potential threats to the species. The limited gene pool may depress reproductive vigor, or a single environmental disturbance such as a landslide could destroy all known extant individuals (57 FR 20580).

Viola helenae

Viola helenae is a small, unbranched perennial subshrub with an erect stem in the violet family (Violaceae). The hairless leaves are clustered on the upper part of the plant and are lance-shaped with a pair of narrow, membranous stipules (leaf-like structures) below each leaf. The small, pale lavender or white flowers are produced on stems either singly or in pairs in the leaf axils. The fruit is a capsule that splits open at maturity, releasing the pale olive brown seeds (St. John 1989; Wagner *et al.* 1999).

Little is known about the life history and ecology of *Viola helenae.* Wagner *et al.* (1999) stated that the flowers are all chasmogamous (open at maturity for access by pollinators) and not cleistogamous (remain closed and self-fertilize in the bud) as in certain other violets. Therefore, it is likely that its flowers require pollination by insects for seed set. Mature flowering plants do produce seed; however, seed viability may be low and microhabitat requirements for germination and growth may be very specific. Seeds planted at NTBG on Kauai failed to germinate, although they may not have been sufficiently mature when collected and violet seeds are often very slow to germinate. The seeds are jettisoned when the capsule splits open, as in most species of the genus (USFWS 1994).

Historically, *Viola helenae* was known from four populations, two along either branch of the Wahiawa Stream on Kauai (56 FR 47695). Currently, there are five known populations, with a total of 137 individual plants, on privately owned land within the Wahiawa Drainage (GDSI 1999; HINHP Database 1999; USFWS 1994). This species is found in *Metrosideros polymorpha-Dicranopteris linearis* lowland wet forest growing on stream banks or adjacent valley bottoms in light to moderate shade between 610–855 m elevation (2,000–2,800 ft) (USFWS 1994; HINHP Database 1999).

Threats include competition from alien plant species, including *Psidium cattleianum, Melastoma candidum,* potentially *Melaleuca quinquenervia, Stachytarpheta dichotoma, Rubus rosaefolius, Elephantopus mollis, Erechtites valerianefolia,* and various alien grasses; trampling and browsing damage by feral pigs; landslides and erosion; and hurricanes (56 FR 47695; USFWS 1994).

Viola kauaiensis var. *wahiawaensis*

Viola kauaiensis, a member of the violet family (Violaceae), is a short-lived perennial herb with upward curving or weakly rising, hairless, lateral stems. The species is distinguished from others of the genus by its nonwoody habit, widely spaced kidney-shaped leaves, and by having two types of flowers: conspicuous, open flowers and smaller, unopened flowers. Two varieties of the species are recognized, both occurring on Kauai: var. *kauaiensis* and var. *wahiawaensis. Viola kauaiensis* var. *wahiawaensis* is distinguished by having broadly wedge-shaped leaf bases (USFWS 1998a;Wagner *et al.* 1999).

Five Viola kauaiensis var. wahiawaensis plants were observed in flower in December 1994 (USFWS 1998a). No additional life history information for this species is currently available.

Viola kauaiensis var. *wahiawaensis* is known only from two populations in the Wahiawa Mountains of Kauai with a total of 13 individual plants on State and privately owned lands (HINHP Database 1999; GDSI 1999). This taxon is not known to have occurred beyond its current range.

Viola kauaiensis var. *wahiawaensis* is found in open montane bog or wet shrubland between 640 and 865 m (2,100 and 2,840 ft) elevation. It is found to be associated with *Metrosideros polymorpha, Dicranopteris linearis, Diplopterygium pinnatum* (NCN) and *Syzygium sandwicensis* (61 FR 53070; Lorence and Flynn 1991; USFWS 1998a; HINHP Database 1999).

The primary threats to *Viola kauaiensis* var. *wahiawaensis* are a risk of extinction from naturally occurring events, such as landslides or hurricanes, and from reduced reproductive vigor due to the small number of existing populations and individuals; habitat degradation through the rooting activities of feral pigs; and competition with alien plants, such as *Juncus planifolius* (NCN) and *Pterolepis glomerata* (NCN) (61 FR 53070; Lorence and Flynn 1991; USFWS 1994; HINHP Database 1999).

Wilkesia hobdyi

Wilkesia hobdyi, a member of the sunflower family (Asteraceae), is a short-lived perennial shrub which branches from the base. The tip of each branch bears a tuft of narrow leaves growing in whorls joined together into a short sheathing section at their bases. The cream-colored flower heads grow in clusters (St. John 1971; Carr 1982a, 1999b).

This species is probably pollinated through outcrossing and is probably self-incompatible. Insects are the most likely pollinators. In 1982, Carr reported that reproduction and seedling establishment were occurring and appeared sufficient to sustain the populations. Flowering was observed most often in the winter months, but also during June. Fruits may be dispersed when they stick to the feathers of birds. Densities reach one plant per square meter (approximately one square yard) in localized areas, and hybridization with *Wilkesia gymnoxiphium* may be occurring (Carr 1982a).

First collected in 1968 on Polihale Ridge, Kauai, this species was not formally described until 1971 (St. John 1971). Currently, there are seven populations with a total of 336 to 401 individuals (HINHP Database 1999; GDSI 1999). This species occurs on State and privately owned lands and may occur on or near land Federal land or land under Federal jurisdiction on Makaha Ridge and in Kokee State Park (GDSI 1999). There are populations in the Puu Ka Pele Forest Reserve, growing on the north-facing, nearly vertical rock outcrops near the summits of the adjacent Polihale and Kaaweiki ridges (HINHP Database 1999). There are also plants growing on a cliff face in Waiahuakua Valley, on the boundary between the Hono O Na Pali NAR and the Na Pali Coast State Park, approximately 16 km (10 mi) northeast of the other populations (HINHP Database 1999).

Wilkesia hobdyi grows on coastal dry cliffs or very dry ridges from 275 to 400 m (900 to 1,310 ft) in elevation. The associated native vegetation includes *Artemisia* sp., *Wilkesia gymnoxiphium, Lipochaeta connata, Lobelia niihauensis, Peucedanum sandwicense, Hibiscus kokio* ssp. *saint johnianus* (kokio), *Canthium odoratum, Peperomia* sp., *Myoporum sandwicense, Sida fallax, Waltheria indica* (uhaloa), *Dodonaea viscosa,* and *Eragrostis variabilis* (57 FR 27859; USFWS 1995; Wagner *et al.* 1999).

The greatest immediate threats to the survival of this species are habitat disturbance and browsing by feral goats. Although the low number of individuals and their restricted habitat could be considered a potential threat to the survival to the species, the plant appears to have vigorous reproduction and may survive indefinitely if goats were eliminated from its habitat. Fire and extinction through naturally occurring events, such as landslides or hurricanes, could also be threats to the survival of the species (57 FR 27859; USFWS 1995).

Xylosma crenatum

Xylosma crenatum is a dioecious (plant bears only male or female flowers, and must cross-pollinated with another plant to produce viable seed) long-lived perennial tree in the flacourtia family (Flacourtiaceae). The tree grows up to 14 m (45 ft) tall and has dark gray bark. The somewhat leathery leaves are oval to elliptic-oval, with coarsely toothed edges and moderately hairy undersides. More coarsely toothed leaf edges and hairy undersides of the leaves distinguish *X. crenatum* from the other Hawaiian member of this genus (Wagner *et al.* 1999).

Little is known about the life history of *Xylosma crenatum.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown.

Historically, *Xylosma crenatum* was known from two sites on Kauai: along upper Nualolo Trail in Kuia NAR and along Mohihi Road between Waiakoali and Mohihi drainages in Na Pali-Kona Forest Reserve (57 FR 20580). Currently, this species is extant on State and privately owned lands in Honopu Valley in Kokee State Park; Nawaimaka Valley in Na Pali-Kona Forest Reserve; and Mahanaloa Valley, and may occur on or near land under Federal jurisdiction in the same areas. There are a total of three populations with eight individual plants total (USFWS 1995; HINHP Database 1999; GDSI 1999).

Xylosma crenatum is known from diverse *Acacia koa-Metrosideros polymorpha* montane wet or mesic

forests and *M. polymorpha-Dicranopteris linearis* montane wet forests between 975 to 1,065 m (3,200 to 3,490 ft) elevation. The species is sometimes found along stream banks and within a planted conifer grove. The species is associated with *Tetraplasandra kauaiensis, Hedyotis terminalis, Pleomele aurea, Ilex anomala, Claoxylon sandwicense, Myrsine alyxifolia* (kolea), *Nestegis sandwicensis, Streblus pendulinus, Psychotria* sp., *Diplazium sandwichianum, Pouteria sandwicensis, Scaevola procera, Coprosma* sp., *Athyrium sandwichianum, Touchardia latifolia, Dubautia knudsenii, Cheirodendron* sp., *Lobelia yuccoides* (NCN), *Cyanea hirta* (haha), *Poa sandwicensis,* and *Diplazium sandwichianum* (57 FR 20580; USFWS 1995; HINHP Database 1999).

The small number of individuals and scattered distribution makes this species vulnerable to human or natural environmental disturbance. *Xylosma crenatum* is also threatened by competition from alien plants, particularly *Psidium guajava.* In addition, feral pigs may threaten this species (57 FR 20580; USFWS 1995; HINHP Database 1999).

Multi-Island Species

Adenophorus periens.

Adenophorus periens, a member of the Grammitis family (Grammitidaceae), is a small, pendant, epiphytic (not rooted on the ground) fern. This species differs from other species in this endemic Hawaiian genus by having hairs along the pinna margins, by the pinnae being at right angles to the midrib axis, by the placement of the sori on the pinnae, and the degree of dissection of each pinna (Linney 1989).

Little is known about the life history of *Adenophorus periens,* which seems to grow only in closed canopy dense forest with high humidity. Its breeding system is unknown, but outbreeding is very likely to be the predominant mode of reproduction. Spores are dispersed by wind, possibly by water, and perhaps on the feet of birds or insects (Linney 1989). Spores lack a thick resistant coat which may indicate their longevity is brief, probably measured in days at most. Due to the weak differences between the seasons, there seems to be no evidence of seasonality in growth or reproduction. *Adenophorus periens* appears to be susceptible to volcanic emissions and/or resultant acid precipitation (Linney 1989). Additional information on reproductive cycles, longevity, specific environmental requirements, and limiting factors is not available.

Historically, *Adenophorus periens* was reported from Kauai, Oahu, Lanai, Maui, and Hawaii Island (59 FR 56333; HINHP Database 1999). Currently, it is known from several locations on Kauai, Molokai, and Hawaii (HINHP Database 1999). On Kauai, there is a total of seven populations on private and State owned lands, with 84–89 individuals, that occur on the boundary of Hono O Na Pali NAR and Na Pali Coast State Park at the head of Hanakoa drainage; Waioli Valley; Wainiha Valley; Kealia Forest Reserve; and in the Wahiawa drainage (GDSI 1999; HINHP Database 1999).

This species, an epiphyte usually growing on *Metrosideros polymorpha* trunks, is found in *M. polymorpha-Cibotium glaucum* lowland wet forest, open *M. polymorpha* montane wet forest, and *M. polymorpha-Dicranopteris linearis* lowland wet forests at elevations between 400 and 1,265 m (1,310 and 4,150 ft) (59 FR 56333). It is found in habitats of well-developed, closed canopy providing deep shade and high humidity (Linney 1989). Associated native species include *Athyrium sandwicensis, Broussaisia arguta, Cheirodendron trigynum, Cyanea* sp., *Cyrtandra* sp., *Freycinetia arborea, Hedyotis terminalis, Labordia hirtella, Machaerina angustifolia, Psychotria* sp., *P. hexandra,* and *Syzygium sandwicensis* (59 FR 56333; Linney 1989).

The threats to this species on Kauai include habitat degradation by feral pigs and goats, and competition with the alien plant *Psidium cattleianum* (59 FR 56333; HINHP Database 1999).

Alectryon macrococcus var. *macrococcus*

Alectryon macrococcus, a member of the soapberry family (Sapindaceae), consists of two varieties, *macrococcus* and *auwahiensis,* both trees with reddish-brown branches and net-veined paper- or leather-like leaves with one to five pairs of sometimes asymmetrical egg-shaped leaflets. The underside of the leaf has dense brown hairs, persistent in *A. m.* var. *auwahiensis,* but only on leaves of young *A. m.* var. *macrococcus* plants. The only member of its genus found in Hawaii, this species is distinguished from other Hawaiian members of its family by being a tree with a hard fruit 2.5 cm (0.9 in.) or more in diameter (Wagner *et al.* 1999).

Alectryon macrococcus is a relatively slow-growing, long-lived tree that grows in xeric to mesic sites and is adapted to periodic drought. Little else is known about the life history of *Alectryon macrococcus.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, and specific environmental requirements are unknown.

Currently, *Alectryon macrococcus* var. macrococcus occurs on State owned land in Waimeae Canyon and in Na Pali Coast State Park on Kauai. A total of six populations of 68–83 individuals is known (GDSI 1999; K. Wood, *in litt.* 1999). This variety is also found on Oahu, Molokai, and West Maui. (57 FR 20772). *Alectryon macrococcus* var. *auwahiensis* is found only on leeward east Maui and will be reviewed further in a subsequent rule (Medeiros *et al.* 1986; HINHP Database 1999).

The habitat of *Alectryon macrococcus* var. *macrococcus* on Kauai is *Diospyros* sp.-*Metrosideros polymorpha* lowland mesic forest, *M. polymorpha* mixed mesic forest, and *Diospyros* sp. mixed mesic forest on dry slopes or in gulches, between elevations of 360–1,070 m (1,180–3,510 ft) (57 FR 20772; Wagner *et al.* 1999). Associated native plants include *Psychotria* sp., *Pisonia* sp., *Xylosma* sp., *Streblus pendulinus, Hibiscus* sp., *Antidesma* sp., *Pleomele* sp., *Acacia koa, Melicope knudsenii, Hibiscus waimeae, Pteralyxia* sp., *Zanthoxylum* sp., *Kokia kauaiensis, Rauvolfia sandwicensis, Nestegis sandwicensis, Myrsine lanaiensis, Canthium odoratum, Canavalia* sp. (awikiwiki), *Alyxia olivaeformis, Nesoluma polynesicum, Munroidendron racemosum, Caesalpinia kauaiensis, Tetraplasandra* sp., *Pouteria sandwicensis,* and *Bobea timonioides* (57 FR 20772; HINHP Database 1999).

Alectryon macrococcus var. *macrococcus* on Kauai is threatened by feral goats and pigs; the alien plant species *Melinis minutiflora, Schinus terebinthifolius* (Christmasberry), and *Psidium cattleianum;* damage from the black twig borer; seed predation by rats and mice (*Mus domesticus*); fire; depressed reproductive vigor; seed predation by insects (probably the endemic microlepidopteran *Prays* cf. *fulvocanella*); loss of pollinators; and, due to the very small remaining number of individuals and their limited distribution, natural or human-caused environmental disturbances which could easily be catastrophic (57 FR 20772).

Bonamia menziesii

Bonamia menziesii, a member of the morning-glory family (Convolvulaceae), is a vine with twining branches that are fuzzy when young. This species is the only member of the genus that is endemic to the Hawaiian Islands and differs from other genera in the family by its two styles, longer stems and

petioles, and rounder leaves (Austin 1999).

Little is known about the life history of this plant. Reproductive cycles, longevity, specific environmental requirements, and limiting factors are unknown.

Historically, *Bonamia menziesii* was known from the following general areas: scattered locations on Kauai, the Waianae Mountains of Oahu, scattered locations on Molokai, one location on West Maui, and eastern Hawaii (HINHP Database 1999). Currently, it is known from Kauai, Oahu, Lanai, Maui, and Hawaii. On Kauai, there are seven total populations with 37 individuals on State and privately owned lands in Kalalau Valley; scattered across the north coast from Paaiki Valley to Milolii Ridge; in Kawaiula Valley; in Haiku; in Hipalau Valley; in Mount Kahili; on Hono O Na Pali NAR; and in Wahiawa drainage. However, it has been estimated that the total number of populations and individuals on Kauai may be as high as a dozen populations with thousands of individuals (HINHP Database 1999; GDSI 1999; USFWS 1999; K. Wood, *in litt.* 1999).

Bonamia menziesii is found in dry, wet, or mesic forest at elevations between 150 and 850 m (500 and 2,800 ft) (59 FR 56333; Austin 1999). Associated species include *Metrosideros polymorpha, Canthium odoratum, Dianella sandwicensis, Diospyros sandwicensis, Dodonaea viscosa, Hedyotis terminalis, Melicope anisata, M. barbigera, Myoporum sandwicense, Nestegis sandwicense, Pisonia* sp., *Pittosporum* sp., *Pouteria sandwicensis,* and *Sapindus oahuensis* (HINHP Database 1999; USFWS 1999).

The primary threats to this species on Kauai include habitat degradation and possible predation by feral pigs and goats, deer, and cattle; competition with a variety of alien plants; and fire (59 FR 56333).

Centaurium sebaeoides

Centaurium sebaeoides, a member of the gentian family (Gentianaceae), is an annual herb with fleshy leaves and stalkless flowers. This species is distinguished from *C. erythraea* (bitter herb), which is naturalized in Hawaii, by its fleshy leaves and the unbranched arrangement of the flower cluster (Wagner *et al.* 1999).

Centaurium sebaeoides has been observed flowering in April. It is possible that heavy rainfall induces flowering. Populations are found in dry areas, and plants are more likely to be found following heavy rains (USFWS 1999).

Historically and currently, *Centaurium sebaeoides* is known from scattered localities on the islands of Kauai, Oahu, Molokai, Lanai, and Maui (HINHP Database 1999). Currently on Kauai, there are a total of three populations with 22–52 individuals on State owned land (HINHP Database 1999; GDSI 1999). This species is found at Kalalau Beach, seacliffs at Pohakuao, and Awaawapuhi Valley (HINHP Database 1999).

Centaurium sebaeoides typically grows in volcanic or clay soils or on cliffs in arid coastal areas below 250 m (820 ft) elevation (56 FR 55770; Wagner et al. 1999). Associated species include *Artemisia* sp., *Bidens* sp., *Chamaesyce celastroides, Dodonaea viscosa, Fimbristylis cymosa* (mau u aki aki), *Heteropogon contortus, Jaquemontia ovalifolia* (pa uohi iaka), *Lipochaeta succulenta, L. heterophylla* (nehe), *L. integrifolia* (nehe), *Lycium sandwicense, Lysimachia mauritiana* (kolokolo kuahiwi), *Mariscus phloides, Panicum fauriei* (NCN), *P. torridum* (kakonakona), *Scaevola sericea, Schiedea globosa* (NCN), *Sida fallax,* and *Wikstroemia uva-ursi* (akia) (56 FR 55770; Medeiros *et al.* 1999).

The major threats to this species on Kauai include habitat degradation by feral goats and cattle; competition from the alien plant species *Casuarina equisetfolia* (paina), *Casuarina glauca* (saltmarsh), *Leucaena leucocephala, Prosopis pallida* (kiawe), *Schinus terebinthifolius, Syzygium cumini* (Java plum), and *Tournefortia argentea* (tree heliotrope); trampling by humans on or near trails; and fire (56 FR 55770; Medeiros *et al.* 1999; USFWS 1999).

Cyperus trachysanthos

Cyperus trachysanthos, a member of the sedge family (Cyperaceae), is a perennial grass-like plant with a short rhizome. The culms are densely tufted, obtusely triangular in cross section, tall, sticky, and leafy at the base. This species is distinguished from others in the genus by the short rhizome, the leaf sheath with partitions at the nodes, the shape of the glumes, and the length of the culms (Koyama 1999).

Little is known about the life history of this species. Reproductive cycles, longevity, specific environmental requirements, and limiting factors are unknown.

Historically, *Cyperus trachysanthos* was known on Niihau, Kauai, scattered locations on Oahu, Molokai, and Lanai (HINHP Database 1999). It is no longer extant on Molokai and Lanai. Currently, this species is reported from the Nualolo Valley on Kauai and west of Mokouia Valley on Niihau. There are two known populations, with about 300 individuals on the island of Kauai and an unknown number of individuals on Niihau (HINHP Database 1999; GDSI 1999).

Cyperus trachysanthos is usually found in wet sites (mud flats, wet clay soil, or wet cliff seeps) on coastal cliffs or talus slopes at elevations between 3 and 160 m (10 and 525 ft). *Hibiscus tiliaceus* (hau) is often found in association with this species (61 FR 53108; Koyama 1999).

On Kauai, the threats to this species are a risk of extinction from naturally occurring events, such as landslides or hurricanes, due to the small number of populations. The threats on Niihau are unknown (61 FR 53108; USFWS 1999).

Delissea undulata ssp. *kauaiensis*

Delissea undulata, a member of the bell flower family (Campanulaceae), is an unbranched, palm-like, woody-stemmed perennial tree, with a dense cluster of leaves at the tip of the stem. One or two knob-like structures often occur on the back of the flower tube. The three recognized subspecies are distinguishable on the basis of leaf shape and margin characters: *D. undulata* ssp. *kauaiensis*, leaf blades are oval and have a flat-margin with sharp teeth; *D. undulata* ssp. *niihauensis*, leaf blades are heart shaped and have a flat-margin with shallow, rounded teeth; and *D. undulata* ssp. *undulata*, leaf blades are elliptic to lance-shaped and wavy-margin with small, sharply pointed teeth. This species is separated from the other closely related members of the genus by its large flowers and berries and broad leaf bases (Lammers 1999).

On the island of Hawaii, *Delissea undulata* ssp. *undulata* was observed in flower and fruit (immature) in August and outplanted individuals were observed in flower in July (61 FR 53124). No other life history information is currently available for any of the three varieties.

Historically and currently, *Delissea undulata* ssp. *kauaiensis* is known only from Kauai. Currently, there is one known population of five individuals on state owned land in the Kuia NAR (GDSI 1999; HINHP Database 1999; K. Wood, *in litt.* 1999). *Delissea undulata* ssp. *niihauensis* was known only from Niihau, but is now considered extinct (HINHP Database 1999; Lammers 1999). *Delissea undulata* ssp. *undulata* was known from southwestern Maui and western Hawaii. Currently, this variety occurs only on the island of Hawaii (61 FR 53124; HINHP Database 1999).

Delissea undulata ssp. *kauaiensis* occurs in open dry or mesic *Sophora chrysophylla* (mamane) and

Metrosideros polymorpha forest at elevations of about 610–1,740 m (2,000–5,700 ft). Associated native species include *Diospyros sandwicensis*, *Dodonaea viscosa*, *Psychotria mariniana*, *P. greenwelliae*, *Santalum ellipticum* (iliahialo e), *Nothocestrum breviflorum* (aiea), and *Acacia koa* (Lammers 1999).

The threats to this subspecies on Kauai are feral goats, pigs, and cattle; small population size; competition with the alien plants *Passiflora mollissima* and *Senecio mikanioides* (German ivy); fire; introduced slugs; seed predation by rats and introduced game birds; and a risk of extinction due to random naturally occurring events, such as landslides or hurricanes (USFWS 1996).

Euphorbia haeleeleana

Euphorbia haeleeleana, a member of the spurge family (Euphorbiaceae), is a dioecious tree with alternate papery leaves. This short-lived perennial species is distinguished from others in the genus in that it is a tree, whereas most of the other species are herbs or shrubs, as well as by the large leaves with prominent veins (Wagner *et al.* 1999).

Individual trees of *Euphorbia haeleeleana* bear only male or female flowers, and must be cross-pollinated from a different tree to produce viable seed. *Euphorbia haeleeleana* sets fruit between August and October (Wagner *et al.* 1999; USFWS 1999). Little else is known about the life history of this species. Reproductive cycles, longevity, specific environmental requirements, and limiting factors are unknown.

Euphorbia haeleeleana is known historically and currently from northwestern Kauai and the Waianae Mountains of Oahu (61 FR 53108; USFWS 1999; HINHP Database 1999; K. Wood, *in litt.* 1999). On Kauai, there is a total of 14 populations with 522–593 individuals occurring on State and privately owned lands (HINHP Database 1999; GDSI 1999; K. Wood, *in litt.* 1999). It is found on valley slopes and cliffs along Kauai's northwestern coast from Pohakuao to Haeleele Valley and Hipalau Valley within Waimeae Canyon, including Kuia NAR and the Na Pali Coast State Park (HINHP Database 1999; K. Wood, *in litt.* 1999).

Euphorbia haeleeleana is usually found in lowland mixed mesic or dry forest that is often dominated by *Metrosideros polymorpha*, *Acacia koa*, or *Diospyros* sp. This plant is typically found at elevations between 205 and 670 m (680 and 2,200 ft), but a few populations have been found up to 870 m (2,860 ft). Associated plants include *Acacia koaia* (koaia), *Antidesma platyphyllum*, *Carex meyenii*, *Carex wahuensis*, *Claoxylon* sp., *Diplazium sandwichianum*, *Dodonaea viscosa*, *Erythrina sandwicensis* (wiliwili), *Kokia kauaiensis*, *Pisonia sandwicensis*, *Pleomele aurea*, *Pouteria sandwicensis*, *Psychotria mariniana*, *P. greenwelliae*, *Pteralyxia sandwicensis*, *Rauvolfia sandwicensis*, *Reynoldsia sandwicensis* (ohe), *Sapindus oahuensis*, *Tetraplasandra kauaiensis*, and *Xylosma* sp. (61 FR 53108).

Threats to this species on Kauai include habitat degradation and/or destruction by deer, feral goats, and pigs; seed predation by rats; fire; and competition with alien plants (61 FR 53108; USFWS 1999).

Flueggea neowawraea

Flueggea neowawraea, a member of the spurge family (Euphorbiaceae), is a large dioecious tree with white oblong pores covering its scaly, pale brown bark. This long-lived perennial species is the only member of the genus found in Hawaii and can be distinguished from other species in the genus by its large size, scaly bark, the shape, size, and color of the leaves, flowers clustered along the branches, and the size and shape of the fruits (Linney 1982; Neal 1965; Hayden 1999; USFWS 1999).

Individual trees of *Flueggea neowawraea* bear only male or female flowers, and must be cross-pollinated from a different tree to produce viable seed (Hayden 1999). Little else is known about the life history of this species. Reproductive cycles, longevity, specific environmental requirements, and limiting factors are unknown.

Historically, *Flueggea neowawraea* was known from Kauai, Oahu, Maui, Molokai, and Hawaii Island (Hayden 1999; HINHP Database 1999). Currently, it is known from Kauai, Oahu, east Maui, and Hawaii. On Kauai, this species is reported from Limahuli Valley, Kalalau, Pohakuao, and the Koaie and Poomau branches of Waimeae Canyon. There is a total of nine populations with 56 individuals occurring on State and privately owned lands. However, it has been estimated that the total number of individuals may be slightly over 100 (HINHP Database 1999; GDSI 1999; USFWS 1999; K. Wood, *in litt.* 1999).

Flueggea neowawraea occurs in dry or mesic forests at elevations of 250 to 1,000 m (820 to 3,280 ft) (Hayden 1999). Associated native plant species include *Alectryon macrococcus*, *Bobea timonioides*, *Charpentiera* sp., *Caesalpinia kauaiense*, *Hibiscus* sp., *Melicope* sp., *Myrsine lanaiensis*, *Metrosideros polymorpha*, *Munroidendron racemosum*, *Tetraplasandra* sp., *Kokia kauaiensis*, *Isodendrion* sp., *Pteralyxia kauaiensis*, *Psychotria mariniana*, *Diplazium sandwichianum*, *Freycinetia arborea*, *Nesoluma polynesicum*, *Diospyros* sp., *Antidesma pulvinatum* (hame), *A. platyphyllum*, *Canthium odoratum*, *Nestegis sandwicensis*, *Rauvolfia sandwicensis*, *Pittosporum* sp., *Tetraplasandra* sp., *Pouteria sandwicensis*, *Xylosma* sp., *Pritchardia* sp., *Bidens* sp., and *Streblus pendulinus* (59 FR 56333; HINHP Database 1999; USFWS 1999).

The threats to this species on Kauai include the black twig borer; habitat degradation by feral pigs, goats, deer, and cattle; competition with alien plant species; fire; small population size; depressed reproductive vigor; and a potential threat of predation on the fruit by rats (59 FR 56333; HINHP Database 1999; USFWS 1999).

Gouania meyenii

Gouania meyenii, a member of the buckthorn family (Rhamnaceae), is a shrub with entire, papery leaves. This short-lived perennial species is distinguished from the two other Hawaiian species of *Gouania* by its lack of tendrils on the flowering branches, the absence of teeth on the leaves, and the lack or small amount of hair on the fruit (Wagner *et al.* 1999).

Gouania meyenii flowers from March to May. Seed capsules develop in about 6 to 8 weeks. Plants appear to live about 10 to 18 years in the wild (USFWS 1998b). No other information exists on specific environmental requirements or limiting factors.

Historically, *Gouania meyenii* was known only from Oahu (HINHP Database 1999; Wagner *et al.* 1999). Currently, this species is found on Oahu and two locations on State and privately owned lands on Kauai: the Na Pali-Kona Forest Reserve and in Koaie Canyon. There is a total of three populations with nine individuals (56 FR 55770; GDSI 1999; HINHP Database 1999).

This species typically grows on rocky ledges, cliff faces, and ridge-tops in dry shrubland or *Metrosideros polymorpha* lowland mesic forest at elevations between 490 to 880 m (1,600 to 2,880 ft) (56 FR 55770; HINHP Database 1999; Wagner *et al.* 1999). Associated plants include *Dodonaea viscosa*, *Chamaesyce* sp., *Psychotria* sp., *Hedyotis* sp., *Melicope* sp., *Nestegis sandwicensis*, *Bidens* sp., *Carex meyenii*, *Diospyros* sp., *Lysimachia* sp., and *Senna gaudichaudii* (kolomona) (56 FR 55770; HINHP Database 1999).

Threats to *Gouania meyenii* on Kauai include competition from the alien

plants *Schinus terebinthifolius*, *Melinis minutiflora*, and *Psidium cattleianum*; fire; habitat degradation by feral pigs and goats; and the small number of extant populations and individuals (56 FR 55770; USFWS 1998b).

Hedyotis cookiana

Hedyotis cookiana, a member of the coffee family (Rubiaceae), is a small shrub with many branches and papery-textured leaves which are fused at the base to form a sheath around the stem. This short-lived perennial species is distinguished from other species in the genus that grow on Kauai by being entirely hairless (Wagner *et al.* 1999).

Little is known about the life history of *Hedyotis cookiana.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown.

Historically, *Hedyotis cookiana* was known from the islands of Hawaii, Kauai, Molokai, and Oahu (HINHP Database 1999). Currently, it is only known from one population of 60–80 individuals on State land within Hono O Na Pali NAR in Waiahuakua Valley on Kauai (GDSI 1999; HINHP Database 1999).

This species generally grows in streambeds or on steep cliffs close to water sources in lowland wet forest communities (59 FR 9304). *Hedyotis cookiana* is believed to have formerly been much more widespread on several of the main Hawaiian Islands at elevations between 170 and 370 m (560 and 1,210 ft) (Wagner *et al.* 1999).

The threats to this species on Kauai are risk of extinction from naturally occurring events, such as landslides or hurricanes, and/or reduced reproductive vigor due to the small number of individuals in the only known population; flooding; competition with alien plants; and habitat modification by feral pigs and goats (59 FR 9304; USFWS 1995; HINHP Database 1999).

Isodendrion laurifolium

Isodendrion laurifolium, a member of the violet family (Violaceae), is a slender, straight shrub with few branches. The short-lived perennial species is distinguished from others in the genus by its leathery, oblong-elliptic or narrowly elliptic lance-shaped leaves (Wagner *et al.* 1999).

Little is known about the life history of this plant. Reproductive cycles, longevity, specific environmental requirements, and limiting factors are unknown.

Historically, *Isodendrion laurifolium* is known from scattered locations on Kauai and Oahu (HINHP Database 1999). Currently, this species is found on Kauai in the following locations: Paaiki, Kawaiula, Haeleele, Makaha, Poopooiki, and Kuia Valleys (including Kuia NAR), and the Koaie branch of Waimeae Canyon (GDSI 1999; HINHP Database 1999). There are a total of eight populations with 132–143 individuals, on State-owned land (HINHP Database 1999; GDSI 1999; USFWS 1999).

Isodendrion laurifolium is usually found between 490 and 820 m (1,600 and 2,700 ft) in elevation in diverse mesic forest, or rarely wet forest, dominated by *Metrosideros polymorpha*, *Acacia koa* or *Diospyros* sp. with *Kokia kauaiensis*, *Streblus* sp., *Elaeocarpus bifidus*, *Canthium odoratum*, *Antidesma* sp., *Xylosma hawaiiense*, *Hedyotis terminalis*, *Pisonia* sp., *Nestegis sandwicensis*, *Dodonaea viscosa*, *Euphorbia haeleeleana*, *Pleomele* sp., *Pittosporum* sp., *Melicope* sp., *Claoxylon sandwicense*, *Alphitonia ponderosa*, *Myrsine lanaiensis*, and *Pouteria sandwicensis* (HINHP Database 1999).

The primary threats to *Isodendrion laurifolium* on Kauai are habitat degradation by feral goats, pigs and deer, and competition with alien plants (61 FR 53108; HINHP Database 1999; USFWS 1999).

Isodendrion longifolium

Isodendrion longifolium, a member of the violet family (Violaceae), is a slender, straight shrub. Hairless, leathery, lance-shaped leaves distinguish this species from others in the genus (Wagner *et al.* 1999).

Little is known about the life history of this short-lived perennial species. Reproductive cycles, longevity, specific environmental requirements, and limiting factors are unknown.

Historically and currently, *Isodendrion longifolium* is known from scattered locations on Kauai and Oahu (61 FR 53108; Lorence and Flynn 1991, 1993; HINHP Database 1999; USFWS 1999). On Kauai, this species is reported from Limahuli Valley, Mt. Kahili, Hanakapiai-Hoolulu Ridge, near Peapea, east of Haupu Peak, Wainiha-Manoa drainage, Hanapepe drainage, Kawaiula Valley, Kalalau Valley, Wahiawa Mountains, upper Waioli Valley, and Honopu. There is a total of 16 populations containing between 472–522 individual plants on State and privately owned lands. This species may also occur on or near land under Federal jurisdiction in Kokee State Park (HINHP Database 1999; GDSI 1999).

Isodendrion longifolium is found on steep slopes, gulches, and stream banks in mixed mesic or wet *Metrosideros polymorpha* forest, usually between 410 and 760 m (1,345 and 2,500 ft) elevation (61 FR 53108). Associated plants include *Dicranopteris linearis*, *Eugenia* sp., *Diospyros* sp., *Pritchardia* sp., *Canthium odoratum*, *Melicope* sp., *Cheirodendron* sp., *Ilex anomala*, *Pipturus* sp., *Hedyotis fluviatilis* (kamapua a), *Peperomia* sp., *Bidens* sp., *Nestegis sandwicensis*, *Syzygium sandwicensis*, *Cibotium* sp., *Bobea brevipes*, *Antidesma* sp., *Cyanea hardyi*, *Cyrtandra* sp., *Hedyotis terminalis*, *Peperomia* sp., *Perrottetia sandwicensis*, *Pittosporum* sp., and *Psychotria* sp. (61 FR 53108; Lorence and Flynn 1993; HINHP Database 1999; USFWS 1999).

The major threats to *Isodendrion longifolium* on Kauai are habitat degradation or destruction by feral goats and pigs, and competition with various alien plants (61 FR 53108; Lorence and Flynn 1993; HINHP Database 1999; USFWS 1999).

Lobelia niihauensis

Lobelia niihauensis, a member of the bellflower family (Campanulaceae), is a small, branched shrub. This short-lived perennial species is distinguished from others in the genus by lacking or nearly lacking leaf stalks, the magenta-colored flowers, the width of the leaf, and length of the flowers (Rock 1919, Lammers 1999).

Lobelia niihauensis flowers in late summer and early fall. Fruits mature a month to six weeks later. Plants are known to live as long as 20 years (USFWS 1998b).

Historically, *Lobelia niihauensis* was known from Oahu, Niihau, and western (Limahuli Valley to near the Hanapepe River) and eastern (Nounou Mountain and the Haupu Range) Kauai (HINHP Database 1999). It is now known to be extant only on Kauai and Oahu (HINHP Database 1999). On Kauai, 12 populations containing 456–1,406 individuals can be found on State and privately owned lands in Waimeae Canyon, on Polihale Ridge, along the Na Pali Coast, and in the Haupu Range (USFWS 1998b; HINHP Database 1999; GDSI 1999).

Lobelia niihauensis typically grows on exposed, mesic shrubland or coastal dry cliffs at elevation of 100 to 830 m (330 to 2720 ft) (HINHP Database 1999, Lammers 1999). Associated native plants include *Eragrostis* sp., *Bidens* sp., *Plectranthus parviflorus*, *Lipochaeta* sp., *Lythrum* sp., *Wilkesia hobdyi*, *Hibiscus kokio* ssp. *saint johnianus*, *Nototrichium* sp., *Schiedea apokremnos*, *Chamaesyce celastroides*, *Charpentiera* sp., and *Artemisia* sp. (HINHP Database 1999; USFWS 1998b).

On Kauai, the major threats to this species are habitat degradation and

browsing by feral goats and competition from alien plants (56 FR 55770).

Lysimachia filifolia

Lysimachia filifolia, a member of the primrose family (Primulaceae), is a small shrub. This short-lived perennial species is distinguished from other taxa of the genus by its leaf shape and width, calyx lobe shape, and corolla length (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.

Historically, *Lysimachia filifolia* was known only from the upper portion of Olokele Valley on Kauai. This species is now also known from Oahu, and the ''blue hole'' area of Waialeale, Kauai (USFWS 1995; HINHP Database 1999). There is currently one population containing a total of 20–75 individuals on State owned land on Kauai (USFWS 1995; HINHP Database 1999; GDSI 1999).

This species 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 245 to 680 m (800 to 2,230 ft). Associated plants include mosses, ferns, liverworts, *Machaerina* sp., *Heteropogon contortus*, and *Melicope* sp. (59 FR 9304; USFWS 1995; HINHP Database 1999; Wagner *et al.* 1999).

The major threats to *Lysimachia filifolia* on Kauai include competition with alien plant species; feral pigs; and the risk of extinction on Kauai from naturally occurring events (*e.g.*, landslides and hurricanes), due to the small number of individuals in the only known population (59 FR 9304; HINHP Database 1999).

Melicope knudsenii

Melicope knudsenii, a member of the citrus family (Rutaceae), is a tree with smooth gray bark and yellowish brown to olive-brown hairs on the tips of the branches. The long-lived perennial species is distinguished from *M. haupuensis* and other members of the genus by the distinct carpels present in the fruit, a hairless endocarp, a larger number of flowers per cluster, and the distribution of hairs on the underside of the leaves (*Stone et al.* 1999).

Little is known about the life history of *Melicope knudsenii.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown.

Historically and currently, *Melicope knudsenii* is known from Maui and Kauai (59 FR 9304; USFWS 1995; HINHP Database 1999). On Kauai, this species is known from five populations on State owned land, with a total of six individuals, in the Koaie drainage of Waimeae Canyon and the upper Kuia Valley (USFWS 1995; GDSI 1999; HINHP Database 1999; K. Wood, *in litt.* 1999).

Melicope knudsenii grows on forested flats or talus slopes in lowland dry to montane mesic forests at elevations of about 450 to 1,000 m (1,480 to 3,280 ft) with *Dodonaea viscosa, Antidesma* sp., *Metrosideros polymorpha, Hibiscus* sp., *Myrsine lanaiensis, Diospyros* sp., *Rauvolfia sandwicensis, Bobea* sp., *Nestegis sandwicensis, Hedyotis* sp., *Melicope* sp., *Psychotria* sp., or *Pittosporum kauaiensis* and *Xylosma* sp. (USFWS 1995; HINHP Database 1999; Stone *et al.* 1999).

The major threats to *Melicope knudsenii* on Kauai include competition with the alien plant, *Lantana camara;* habitat degradation by feral goats and pigs; fire; black twig borer; and the risk of extinction on Kauai from naturally occurring events, such as landslides or hurricanes, and/or reduced reproductive vigor due to the small number of existing individuals and populations (59 FR 9304; USFWS 1995).

Melicope pallida

Melicope pallida, a member of the citrus family (Rutaceae), is a tree with grayish white hairs and black, resinous new growth. The long-lived perennial species differs from *M. haupuensis, M. knudsenii,* and other members of the genus by presence of resinous new growth, leaves folded in clusters of three, and fruits with separate carpels (Stone *et al.* 1999).

Little is known about the life history of *Melicope pallida.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown.

Historically and currently, *Melicope pallida* is known from Oahu and Kauai (USFWS 1995; HINHP Database 1999; D.W. Mathias, U.S. Navy *in litt.* 1999). On Kauai, the species is currently known in the following locations: Kalalau Valley and rim, Limahuli Valley, Koaie Stream in Waimeae Canyon, Pohakuao Valley, and Awaawapuhi Valley to Honopu Valley (59 FR 9304; K. Wood, *in litt.* 1999; HINHP Database 1999). There is a total of five populations with 181 individuals on State owned land (USFWS 1995; HINHP Database 1999; GDSI 1999; K. Wood, *in litt.* 1999), although the status of the one individual in Limahuli Valley is unknown (USFWS 1995).

Melicope pallida usually grows on steep rock faces in lowland to montane mesic to wet forests or shrubland at an elevation 490 to 915 m (1,600 to 3,000 ft) (59 FR 9304; Lorence and Flynn 1991; Stone *et al.* 1999). Associated plant taxa include *Dodonaea viscosa, Lepidium serra, Pleomele* sp., *Boehmeria grandis, Coprosma* sp., *Hedyotis terminalis, Melicope* sp., *Pouteria sandwicensis, Poa mannii, Schiedea membranacea, Psychotria mariniana, Dianella sandwicensis, Pritchardia minor, Chamaesyce celastroides* var. *hanapepensis, Nototrichium* sp., *Carex meyenii, Artemisia* sp., *Abutilon sandwicense, Alyxia olivaeformis, Dryopteris unidentata* (kumunui), *Metrosideros polymorpha, Pipturus albidus* (mamaki), *Sapindus oahuensis, Tetraplasandra* sp., and *Xylosma hawaiiense* (59 FR 9304; USFWS 1995; HINHP Database 1999).

The major threats to *Melicope pallida* are habitat destruction by feral goats and pigs; the black twig borer; fire; susceptibility to extinction from naturally occurring events, such as landslides or hurricanes, and/or reduced reproductive vigor due to the small number of existing populations; and competition with alien plant taxa (59 FR 9304; Hara and Beardsley 1979; Medeiros *et al.* 1986; USFWS 1995; HINHP Database 1999).

Peucedanum sandwicense

Peucedanum sandwicense, a member of the parsley family (Apiaceae), is a parsley-scented, sprawling herb. Hollow stems arise from a short, vertical stem with several fleshy roots. This short-lived perennial species is the only member of the genus in the Hawaiian Islands, one of three genera of the family with taxa endemic to the island of Kauai. This species differs from the other Kauai members of the parsley family in having larger fruit and pinnately compound leaves with broad leaflets (Constance and Affolter 1999).

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

Historically and currently, *Peucedanum sandwicense* is known from Molokai, Maui, and Kauai (HINHP Database 1999). Discoveries in 1990 extended the known distribution of this species to the Waianae Mountains on the island of Oahu (59 FR 9304). Additionally, a population is known from State-owned Keopuka Rock, an islet off the coast of Maui. On Kauai, there are a total of 14 populations on

State and privately owned lands, containing between 238–339 individuals, in Kuia NAR, on the boundary of Na Pali Coast State Park and Hono O Na Pali NAR between Hanakapiai and Hoolulu Valleys, the mouth of the Hanakapiai Stream, in Waiahuakua Valley, Hoolulu Valley, Limahuli Valley, Waimeae Canyon, Kalalau trail, Kaaalahina Ridge, Hanakoa Valley, Haupu, Mahanaloa Valley, and Pohakuao (USFWS 1995; HINHP Database 1999; GDSI 1999; K. Wood, *in litt.* 1999).

This species grows in mixed shrub coastal dry cliff communities or diverse mesic forest from sea level to above 915 m (3,000 ft). It is associated with *Hibiscus kokio, Brighamia insignis, Bidens* sp., *Artemisia* sp., *Lobelia niihauensis, Wilkesia gymnoxiphium, Canthium odoratum, Dodonaea viscosa, Psychotria* sp., *Acacia koa, Kokio kauaiensis, Carex meyenii, Panicum lineale, Chamaesyce celastroides, Eragrostis* sp., *Diospyros* sp., and *Metrosideros polymorpha* (59 FR 9304; Constance and Affolter 1999; HINHP Database 1999).

The major threats to *Peucedanum sandwicense* on Kauai include competition with introduced plants; habitat degradation and browsing by feral goats and deer; and trampling and trail clearing (Hanakapiai population) (59 FR 9304; USFWS 1995; HINHP Database 1999).

Plantago princeps

Plantago princeps, a member of the plantain family (Plantaginaceae), is a small shrub or robust perennial herb. This short-lived perennial species differs from other native members of the genus in Hawaii by its large branched stems, flowers at nearly right angles to the axis of the flower cluster, and fruits that break open at a point two-thirds from the base. The four varieties, *anomala, laxiflora, longibracteata,* and *princeps,* are distinguished by the branching and pubescence of the stems; the size, pubescence, and venation of the leaves; the density of the inflorescence; and the orientation of the flowers (Wagner *et al.* 1999).

Little is known about the life history of this plant. Reproductive cycles, longevity, specific environmental requirements, and limiting factors are generally unknown. However, individuals have been observed in fruit from April through September (USFWS 1999).

Historically, *Plantago princeps* was found on the islands of Hawaii, Kauai, Maui, Molokai, and Oahu. It no longer occurs on the island of Hawaii. Two varieties of the species, totaling seven populations, with 500–572 individuals, are extant on the island of Kauai, on both State and privately owned lands (HINHP Database 1999; GDSI 1999). Historically on Kauai, *Plantago princeps* var. *anomala* was reported from a ridge west of Hanapepe River. Currently, this variety is found on Mt. Kahili, upper Pohakuao (near Puu Ki), and from the south rim and upper reaches of Kalalau Valley. *Plantago princeps* var. *longibracteata* was historically known from Hanalei, the Wahiawa Mountains, and Hanapepe Falls. Currently, populations are known from Namolokama, Iliiliula drainage, Wainiha Valley, Waioli Valley, and Waialeale (59 FR 56333; GDSI 1999; HINHP Database 1999; USFWS 1999).

Plantago princeps is typically found on steep slopes, rock walls, or at bases of waterfalls in mesic to wet *Metrosideros polymorpha* forest from 480 to about 1,100 m (1,575 to 3,610 ft) in elevation (Wagner *et al.* 1999). Associated plant species include *Dodonaea viscosa, Psychotria* sp., *Dicranopteris linearis, Cyanea* sp., *Hedyotis* sp., *Melicope* sp., *Xylosma* sp., *Pleomele* sp., *Machaerina angustifolia, Athyrium* sp., *Bidens* sp., *Eragrostis* sp., *Lysimachia filifolia, Pipturus* sp., *Cyrtandra* sp., and *Dubautia plantaginea,* as well as *Exocarpos luteolus, Poa siphonoglossa, Nothocestrum peltatum, Remya montgomeryi,* and *Stenogyne campanulata,* and the threatened *Myrsine linearifolia* (HINHP Database 1999; USFWS 1999).

The primary threats to *Plantago princeps* on Kauai are herbivory and habitat degradation by feral pigs and goats, and competition with various alien plant species. Ungulate herbivory is especially severe, with numerous observations of *P. princeps* individuals exhibiting browse damage (61 FR 53108; USFWS 1999).

Platanthera holochila

Platanthera holochila, a member of the orchid family (Orchidaceae), is an erect, deciduous herb. The stems arise from underground tubers, the pale green leaves are lance to egg-shaped, and the greenish-yellow flowers occur in open spikes. This short-lived perennial is the only species of this genus that occurs in the Hawaiian Islands (Wagner *et al.* 1999).

Little is known about the life history of this plant. Reproductive cycles, longevity, specific environmental requirements, and limiting factors are unknown.

Historically, *Platanthera holochila* was known from the Alakai Swamp, Kaholuamano area, and the Wahiawa Mountains on Kauai, and scattered locations on Oahu, Molokai, and Maui (HINHP Database 1999). Currently, *P. holochila* is extant on Kauai, Molokai, and Maui (HINHP Database 1999). On Kauai, there are one to two populations with nine individuals reported on State and privately owned lands in the Alakai Swamp (HINHP Database 1999; GDSI 1999).

Platanthera holochila is found in montane *Metrosideros polymorpha-Dicranopteris linearis* montane wet forest or *M. polymorpha* mixed bog between 1,050 and 1,600 m (3,450 and 5,245 ft) elevation. Associated native plants include *Myrsine denticulata* (kolea), *Cibotium* sp., *Coprosma ernodeoides* (kukaenene), *Oreobolus furcatus* (NCN), *Styphelia tameiameiae,* and *Vaccinium* sp. (61 FR 53108; USFWS 1999).

The primary threats to *Platanthera holochila* on Kauai are habitat degradation and/or destruction by feral cattle and pigs; competition with alien plants; and a risk of extinction on Kauai from naturally occurring events, such as landslides or hurricanes, and/or reduced reproductive vigor, due to the small number of remaining populations and individuals. Predation by introduced slugs may also be a potential threat to this species (61 FR 53108; USFWS 1999).

Schgiedea nuttallii

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 (Weller and Sakai 1999). 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 (USFWS 1999).

Historically and currently, *Schiedea nuttallii* is known from Kauai and Oahu (61 FR 53108; HINHP Database 1999). In addition, it was also reported from Molokai and Maui (USFWS 1999). Currently on Kauai, one population with 10–50 individuals is reported from

east of Haupu Peak on privately owned land. The status of individuals previously found in the Limahuli Valley is currently unknown (HINHP Database 1999; GDSI 1999; USFWS 1999).

Schiedea nuttallii typically grows in diverse lowland mesic *Metrosideros polymorpha* forest at elevations between 415 and 790 m (1,360 and 2,590 ft). Associated plants include *Antidesma* sp., *Psychotria* sp., *Perrottetia sandwicensis, Pisonia* sp., and *Hedyotis acuminata* (USFWS 1999).

Schiedea nuttallii is threatened on Kauai by habitat degradation and/or destruction by feral pigs, goats, and possibly deer; competition with several alien plants; landslides; predation by the black twig borer; and a risk of extinction from naturally occurring events (e.g., landslides or hurricanes) and/or reduced reproductive vigor, due to the small number of individuals in the only known population (61 FR 53108; USFWS 1999). Based on observations that indicate that introduced snails and slugs may consume seeds and seedlings, it is likely that introduced molluscs also represent a major threat to this species (61 FR 53108; USFWS 1999).

Sesbania tomentosa

Sesbania tomentosa, a member of the pea family (Fabaceae), is typically a sprawling short-lived perennial 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 color tinged with yellow, orange-red, scarlet or rarely, pure yellow coloration. *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* is being studied by David Hopper, a graduate student in the Department of Zoology at the University of Hawaii at Manoa. His preliminary 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 (USFWS 1999). Other aspects of this plant's life history are unknown.

Currently, *Sesbania tomentosa* occurs on at least six of the eight main Hawaiian Islands (Kauai, Oahu, Molokai, Kahoolawe, Maui, and Hawaii) and in the Northwestern Hawaiian Islands (Nihoa and Necker). Although once found on Niihau and Lanai, it is no longer extant on these islands (59 FR 56333; GDSI 1999, USFWS 1999; HINHP Database 1999). On Kauai, *S. tomentosa* is known from two populations, with eight individuals, from the Polihale State Park area (State land) and may extend onto privately owned land and the PMRF (Federal land) (HINHP Database 1999; GDSI 1999).

Sesbania tomentosa is found on sandy beaches, dunes, soil pockets on lava, and along pond margins (Geesink *et al.* 1999; USFWS 1999). It commonly occurs in coastal dry shrublands and grasslands, but is also known from open *Metrosideros polymorpha* forests and mixed coastal dry cliffs in lower elevations (HINHP Database 1999). Associated plant species include *Sida fallax*, *Scaevola sericea*, *Dodonaea viscosa*, *Heteropogon contortus*, *Myoporum sandwicense*, and *Sporobolus virginicus* (akiaki) (HINHP Database 1999; USFWS 1999).

The primary threats to *Sesbania tomentosa* on Kauai are habitat degradation caused by competition with various alien plant species; lack of adequate pollination; seed predation by rats, mice and, potentially, alien insects; fire; and destruction by off-road vehicles and other human disturbances (59 FR 56333; USFWS 1999).

Solanum sandwicense

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 4 lobes along the margins. This short-lived perennial species differs from others of the genus in having dense hairs on young plant parts, a greater height, and its lack of prickles (Sohmer and Gustafson 1987; 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.

Historically, *Solanum sandwicense* was known from both Oahu and Kauai (59 FR 9304; USFWS 1995; HINHP Database 1999; K. Wood, *in litt.* 1999). Currently, this species is only known from Kauai (Joan Yoshioka, The Nature Conservancy of Hawaii (TNCH), pers. comm. 2000). On Kauai, this species was reported from locations in the Kokee region bounded by Kalalau Valley, Milolii Ridge, and extending to the Hanapepe River (USFWS 1995; HINHP Database 1999). Currently, *Solanum sandwicense* is only known from eight populations of 13–14 individual plants on private and State lands (Kokee and Na Pali Coast State Parks), and may occur on or near land under Federal jurisdiction in Kokee State Park (HINHP Database 1999; GDSI 1999; K. Wood, *in litt.* 1999).

This species is typically found in open, sunny areas at elevations between 760 and 1,220 m (2,500 and 4,000 ft) in diverse lowland or montane mesic forests or occasionally in wet forests (HINHP Database 1999; Symon 1999). Associated plant taxa include *Alphitonia ponderosa*, *Ilex anomala*, *Xylosma* sp., *Athyrium sandwicensis*, *Syzygium sandwicensis*, *Bidens cosmoides*, *Dianella sandwicensis*, *Poa siphonoglossa*, *Carex meyenii*, *Hedyotis* sp., *Coprosma* sp., *Dubautia* sp., *Pouteria sandwicensis*, *Cryptocarya mannii*, *Acacia koa*, *Metrosideros polymorpha*, *Dicranopteris linearis*, *Psychotria* sp., and *Melicope* sp. (59 FR 9304; USFWS 1995; HINHP Database 1999).

The major threats to populations of *Solanum sandwicense* on Kauai are habitat degradation by feral pigs, and competition with alien plant taxa (*Passiflora mollissima*, *Rubus argutus*, *Psidium cattleianum*, *Hedychium gardnerianum* (kahili ginger), and *Lonicera japonica*); fire; human disturbance and development; and a risk of extinction from naturally occurring events (*e.g.*, landslides or hurricanes) and/or reduced reproductive vigor due to the small number of existing individuals (59 FR 9304; USFWS 1995; HINHP Database 1999).

Spermolepis hawaiiensis

Spermolepis hawaiiensis, a member of the parsley family (Apiaceae), is a slender annual herb with few branches. Its leaves, dissected into narrow, lance-shaped divisions, are oblong to somewhat oval in outline and grow on stalks. Flowers are arranged in a loose, compound umbrella-shaped inflorescence arising from the stem, opposite the leaves. *Spermolepis hawaiiensis* is the only member of the genus native to Hawaii. It is distinguished from other native members of the family by being a non-succulent annual with an umbrella-shaped inflorescence (Constance and Affolter 1999).

Little is known about the life history of *Spermolepis hawaiiensis.* Reproductive cycles, longevity, specific environmental requirements, and limiting factors are unknown.

Historically, *Spermolepis hawaiiensis* was known from the islands of Kauai, Oahu, Lanai, and Hawaii (HINHP Database 1999). Currently, it is found on Kauai, Oahu, Molokai, Lanai, West Maui, and Hawaii (59 FR 56333; GDSI 1999; HINHP Database 1999). On Kauai, this species has been observed on State and private land in the Koaie branch and other unspecified locations within Waimeae Canyon, Hanapepe at Kapahili Gulch, and Hipalau (HINHP Database 1999). There are two known populations with four individuals total on Kauai. However, it has been estimated that the total number of plants on Kauai may be as high as a few thousand (HINHP Database 1999; GDSI 1999; USFWS 1999).

Spermolepis hawaiiensis is known from various vegetation types, including *Metrosideros polymorpha* forest and *Dodonaea viscosa* lowland dry shrubland, at elevations from about 305 to 610 m (1,000 to 2,000 ft). Associated plant species include *Eragrostis variabilis*, *Bidens sandvicensis*, *Schiedea spergulina*, *Lipochaeta* sp., *Cenchrus agrimonioides* (kamanomano), *Sida fallax*, *Doryopteris* sp., and the Federally listed endangered *Gouania hillebrandii* (HINHP Database 1999; USFWS 1999).

The primary threats to *Spermolepis hawaiiensis* on Kauai are habitat degradation by feral goats; competition with various alien plants; and erosion, landslides, and rockslides due to natural weathering which result in the death of individual plants, as well as habitat destruction (59 FR 56333; USFWS 1999).

Zanthoxylum hawaiiense

Zanthoxylum hawaiiense is a medium-size tree with pale to dark gray bark, and lemon-scented leaves in the rue family (Rutaceae). Alternate leaves are composed of three small triangular-oval to lance-shaped, toothed leaves (leaflets) with surfaces usually without hairs. A long-lived perennial tree, *Zanthoxylum hawaiiense* is distinguished from other Hawaiian members of the genus by several characteristics: three leaflets all of similar size, one joint on lateral leaf stalk, and sickle-shape fruits with a rounded tip (Stone *et al.* 1999).

No life history information is currently available for this species.

Historically, *Zanthoxylum hawaiiense* was known from five islands: Kauai, Molokai, Lanai, Maui, and Hawaii. Currently, *Zanthoxylum hawaiiense* is found on Kauai, Molokai, Maui, and Hawaii. On Kauai, this species is only known from a single individual on State owned land in Waimeae Valley (HINHP Database 1999; GDSI 1999).

Zanthoxylum hawaiiense is reported from lowland dry or mesic forests, or montane dry forest, at elevations between 550 and 1,740 m (1,800 and 5,700 ft) (Stone *et al.* 1999). This species is typically found in forests dominated by *Metrosideros polymorpha* or *Diospyros sandwicensis* (59 FR 10305; HINHP Database 1999). Other associated species include *Pleomele auwahiensis* (halapepe), *Antidesma platyphyllum*, *Pisonia* sp., *Alectryon macrococcus*, *Charpentiera* sp., *Melicope* sp., *Dodonaea viscosa*, *Streblus pendulinus*, *Myrsine lanaiensis*, and *Sophora chrysophylla* (HINHP Database 1999).

The threats to *Zanthoxylum hawaiiense* on Kauai include competition with the alien plant species (*Melia azedarach*, *Lantana camara*, and *Pennisetum setaceum* (fountain grass)); fire; human disturbance; and risk of extinction from naturally occurring events, such as landslides or hurricanes, and/or reduced reproductive vigor due to the small number of individuals in the only known population (59 FR 10305; USFWS 1996).

A summary of populations and landownership for these 81 plants species on Kauai and Niihau is given in Table 3.

TABLE 3.—SUMMARY OF POPULATIONS AND LANDOWNERSHIP FOR 81 SPECIES ON KAUAI AND NIIHAU

Species	Number of current populations	Landownership		
		Federal	State	Private
Adenophorus periens	7		X	X
Alectryon macrococcus	6		X	
Alsinidendron lychnoides	4		X	
Alsinidendron viscosum	4		X	X
Bonamia menziesii	7		X	X
Brighamia insignis	5		X	X
Centaurium sebaeoides	3		X	
Chamaesyce halemanui	7		X	
Cyanea asarifolia	2		X	
Cyanea recta	8		X	X
Cyanea remyi	7		X	X
Cyanea undulata	1			X
Cyperus trachysanthos	2		X	X
Cyrtandra cyaneoides	4		X	X
Cyrtandra limahuliensis	13		X	X
Delissea rhytidosperma	3		X	X
Delissea rivularis	2		X	X
Delissea undulata	1		X	
Diellia pallida	5		X	
Dubautia latifolia	24		X	X
Dubautia pauciflorula	4		X	X
Euphorbia haeleeleana	14		X	X
Exocarpos luteolus	9		X	X
Flueggea neowawraea	9		X	X
Gouania meyenii	3		X	X
Hedyotis cookiana	1		X	
Hedyotis st.-johnii	6		X	
Hesperomannia lydgatei	4		X	X
Hibiscadelphus woodii	1		X	
Hibiscus clayi	1		X	X
Hibiscus waimeae ssp. *hannerae*	2		X	X

TABLE 3.—SUMMARY OF POPULATIONS AND LANDOWNERSHIP FOR 81 SPECIES ON KAUAI AND NIIHAU—Continued

Species	Number of current populations	Landownership		
		Federal	State	Private
Isodendrion laurifolium	8		X	
Isodendrion longifolium	16	X	X	X
Kokia kauaiensis	11		X	
Labordia lydgatei	6		X	X
Labordia tinifolia var.	1			X
Lipochaeta fauriei	4		X	X
Lipochaeta micrantha	6		X	X
Lipochaeta waimeaensis	1		X	X
Lobelia niihauensis	12		X	X
Lysimachia filifolia	1		X	
Melicope haupuensis	3		X	
Melicope knudsenii	5		X	
Melicope pallida	5		X	
Melicope quadrangularis (extinct)	0			
Munroidendron racemosum	15		X	X
Myrsine linearifolia	8		X	X
Nothocestrum peltatum	9	X	X	
Panicum niihauense	1	X	X	X
Peucedanum sandwicense	14		X	X
Phyllostegia knudsenii	2		X	
Phyllostegia waimeae (extinct)	0			
Phyllostegia wawrana	4	X	X	X
Plantago princeps	7		X	X
Platanthera holochila	1–2		X	X
Poa mannii	6		X	
Poa sandvicensis	9		X	X
Poa siphonoglossa	5		X	
Pritchardia aylmer-robinsonii	1			X
Pritchardia napaliensis	4		X	
Pritchardia viscosa	1			X
Pteralyxia kauaiensis	20	X	X	X
Remya kauaiensis	14		X	
Remya montgomeryi	3	X	X	
Schiedea apokremnos	5		X	
Schiedea helleri	2		X	
Schiedea kauaiensis	2		X	
Schiedea membranacea	9	X	X	X
Schiedea nuttallii	1			X
Schiedea spergulina var. *leiopoda*	1			X
Schiedea spergulina var. *spergulina*	3		X	X
Schiedea stellarioides	2		X	
Sesbania tomentosa	2	X	X	X
Solanum sandwicense	8	X	X	X
Spermolepis hawaiiensis	2		X	X
Stenogyne campanulata	1–3		X	
Viola helenae	5			X
Viola kauaiensis var. *wahiawaensis*	2		X	X
Wilkesia hobdyi	7	X	X	X
Xylosma crenatum	3	X	X	X
Zanthoxylum hawaiiense	1		X	

Previous Federal Action

Federal action on these plants began as a result of Section 12 of the Act, which directed the Secretary of the Smithsonian Institution to prepare a report on plants considered to be endangered, threatened, or extinct in the United States. This report, designated as House Document No. 94–51, was presented to Congress on January 9, 1975. In that document, *Adenophorus periens*, *Alectryon macrococcus* (as *A. macrococcum* var. *macrococcum* and *A. mahoe*), *Bonamia menziesii*, *Brighamia insignis* (as *B. citrina* var. *napaliensis* and *B. insignis*), *Chamaesyce halemanui* (as *Euphorbia halemanui*), *Delissea rhytidosperma*, *Dubautia latifolia* (as *D. latifolia* var. *latifolia*), *Exocarpos luteolus*, *Flueggea neowawraea* (as *Drypetes phyllanthoides*), *Hedyotis st.-johnii*, *Hesperomannia lydgatei*, *Hibiscus clayi* (as *H. clayi* and *H. newhousei*), *H. waimeae* ssp. *hannerae* (as *H. waimeae*), *Kokia kauaiensis*, *Lipochaeta fauriei*, *L. micrantha* (as *L. exigua*), *Lobelia niihauensis*, *Melicope haupuensis* (as *Pelea haupuensis*), *M. knudsenii* (as *P. multiflora*), *M. pallida* (as *P. leveillei* and *P. pallida*), *Melicope quadrangularis* (*Pelea quadrangularis*), *Myrsine linearifolia* (as *M. linearifolia* var. *linearifolia*), *Nothocestrum peltatum*, *Peucedanum sandwicense* (as *P. kauaiense*), *Phyllostegia knudsenii*, *Plantago princeps* (as *P. princeps* var. *elata*, *P.* var. *laxifolia*, and *P.* var. *princeps*), *Poa sandvicensis*, *Pritchardia aylmer-robinsonii*, *Sesbania tomentosa* (as *S. hobdyi* and *S. tomentosa* var. *tomentosa*), *Solanum sandwicense* (as *S. hillebrandii* and *S. kauaiense*), *Viola helenae*, *V. kauaiensis* var. *wahiawaensis*, *Wilkesia hobdyi*, *Xylosma crenatum* (as *Antidesma*

crenatum), and *Zanthoxylum hawaiiense* (as *Z. hawaiiense* var. *citiodora*), were considered to be endangered; *Delissea rivularis*, *Diellia pallida* (as *Diellia laciniata*), *Labordia lydgatei*, *Lipochaeta micrantha*, *L. waimeaensis*, *Lysimachia filifolia*, *Schiedea membranacea*, and *Zanthoxylum hawaiiense* (as *Z. hawaiiense* var. *hawaiiense* and *Z. hawaiiense* var. *velutinosum*) were considered to be threatened; and *Delissea undulata* (as *D. undulata* var. *argutidenta* and *D. undulata* var. *undulata*), *Gouania meyenii*, *Hedyotis cookiana*, *Melicope knudsenii* (as *Pelea knudsenii* and *P. tomentosa*), *Munroidendron racemosum* (as *M. racemosum* var. *macdanielsii*), *Plantago princeps* (as *P. princeps* var. *acaulis*, *P. princeps* var. *denticulata*, and *P. princeps* var. *queleniana*), and *Remya kauaiensis* were considered to be extinct. On July 1, 1975, the Service published a notice in the **Federal Register** (40 FR 27823) of its acceptance of the Smithsonian report as a petition within the context of Section 4(c)(2) (now Section 4(b)(3)) of the Act, and gave notice of its intention to review the status of the plant taxa named therein. As a result of that review, on June 16, 1976, the Service published a proposed rule in the **Federal Register** (41 FR 24523) to determine endangered status pursuant to Section 4 of the Act for approximately 1,700 vascular plant taxa, including all of the above taxa, except for *Diellia pallida* considered to be endangered or thought to be extinct,. The list of 1,700 plant taxa was assembled on the basis of comments and data received by the Smithsonian Institution and the Service in response to House Document No. 94–51 and the July 1, 1975, **Federal Register** publication.

General comments received in response to the 1976 proposal were summarized in an April 26, 1978, **Federal Register** publication (43 FR 17909). In 1978, amendments to the Act required that all proposals over two years old be withdrawn. A one-year grace period was given to proposals already over two years old. On December 10, 1979, the Service published a notice in the **Federal Register** (44 FR 70796) withdrawing the portion of the June 16, 1976, proposal that had not been made final, along with four other proposals that had expired. The Service published updated notices of review for plants on December 15, 1980 (45 FR 82479), September 27, 1985 (50 FR 39525), February 21, 1990 (55 FR 6183), and September 30, 1993 (58 FR 51144).

A summary of the status categories for these 81 plant species in the 1980–1993 notices of review can be found in Table 4(a) and a summary of the listing actions can be found in Table 4(b).

TABLE 4(A).—SUMMARY OF CANDIDACY STATUS FOR 81 PLANT SPECIES FROM KAUAI AND NIIHAU

Species	Federal Register notice of review			
	1980	1985	1990	1993
Adenophorus periens	C1	C1	C1	
Alectryon macrococcus	C1	3C	C1	
Alsinidendron lychnoides		C1*		C2
Alsinidendron viscosum		C1*	3A	
Bonamia menziesii	C1	C1	C1	
Brighamia insignis	C1	C1	C1	
Centaurium sebaeoides			C1	
Chamaesyce halemanui	C1	C1	C1	
Cyanea asarifolia			C1	
Cyanea recta			3A	
Cyanea remyi.				
Cyanea undulata			3A	
Cyperus trachysanthos				C2
Cyrtandra cyaneoides				C2
Cyrtandra limahuliensis			C1	
Delissea rhytidosperma	C1	C1	C1	
Delissea rivularis	C2	C2	3A	
Delissea undulata	C1	C1*	C1*	
Diellia pallida			C1*	
Dubautia latifolia	C1	C1	C1	
Dubautia pauciflorula			C1	
Euphorbia haeleeleana	C1	C1	C1	
Exocarpos luteolus		C1	C1	
Flueggea neowawraea	C1	C1	C1	
Gouania meyenii	3A	3A	C1	
Hedyotis cookiana	3A	3A	C1	
Hedyotis st.-johnii	C1	C1	C1	
Hesperomannia lydgatei	C1	C1	C1	
Hibiscadelphus woodii.				
Hibiscus clayi	C1	C1	C1	
Hibiscus waimeae ssp. *hannerae*	3C	3C	C2	C2
Isodendrion laurifolium	C1	C1	C1	C2
Isodendrion longifolium	C1	C1	C1	C2
Kokia kauaiensis	C2	C2	C2	C2
Labordia lydgatei	C2	C2	C2	
Labordia tinifolia var. *wahiawaensis.*				
Lipochaeta fauriei	C1*	C1*	C1	
Lipochaeta micrantha	C1	C1	C1	
Lipochaeta waimeaensis	C1	C1	C1	
Lobelia niihauensis	C1	C1	C1	
Lysimachia filifolia	C2	C2	C1	
Melicope haupuensis	C1	C1	C1	

TABLE 4(A).—SUMMARY OF CANDIDACY STATUS FOR 81 PLANT SPECIES FROM KAUAI AND NIIHAU—Continued

Species	Federal Register notice of review			
	1980	1985	1990	1993
Melicope knudsenii	C1*	C1*	C1	
Melicope pallida			C1*	
Melicope quadrangularis	C1	C1	C1*	
Munroidendron racemosum	C1	C1	C1	
Myrsine linearifolia	C1	C1	C2	C2
Nothocestrum peltatum	C1	C1	C1	
Panicum niihauense				C2
Peucedanum sandwicense	C2	C2	C2	
Phyllostegia knudsenii	C1	C1	3A	
Phyllostegia waimeae			C1	
Phyllostegia wawrana			3A	
Plantago princeps	C2	C2	C1	
Platanthera holochila	C1	C1	C1	C2
Poa mannii	C1	C1	C1*	
Poa sandvicensis	C1	C1	C1	
Poa siphonoglossa	C1	C1	C1	
Pritchardia aylmer-robinsonii	C1	C1	C1	
Pritchardia napaliensis			C2	C2
Pritchardia viscosa			C2	C2
Pteralyxia kauaiensis	C1	C1	C1	
Remya kauaiensis	C1*	C1*		
Remya montgomeryi.				
Schiedea apokremnos		C1	C1	
Schiedea helleri		C1*	3A	
Schiedea kauaiensis.				
Schiedea membranacea	C2	C2	C2	C2
Schiedea nuttallii				C2
Schiedea spergulina var. *leiopoda*		C1	C1*	
Schiedea spergulina var. *spergulina*		C1	C1	
Schiedea stellarioides		C1*	3A	
Sesbania tomentosa	C1*	C1*	C1	
Solanum sandwicense	C1*	C1*	C1	
Spermolepis hawaiiensis			C1	
Stenogyne campanulata			C1	
Viola helenae	C1	C1	C1	
Viola kauaiensis var. *wahiawaensis*	C1	C1	C2	C2
Wilkesia hobdyi	C1	C1		
Xylosma crenatum	C2	C2	C1	
Zanthoxylum hawaiiense	C1	C1	C1	

Key:
C1: Taxa for which the Service has on file enough substantial information on biological vulnerability and threat(s) to support proposals to list them as endangered or threatened species.
C1*: Taxa of known vulnerable status in the recent past that may already have become extinct.
C2: Taxa for which there is some evidence of vulnerability, but for which there are not enough data to support listing proposals at this time.
3A: Taxa for which the Service has persuasive evidence of extinction. If rediscovered, such taxa might acquire high priority for listing.
3C: Taxa that have proven to be more abundant or widespread than previously believed and/or those that are not subject to any identifiable threat.
Federal Register Notice of Review.
1980: 45 FR 82479; 1985: 50 FR 39525; 1990: 55 FR 6183; 1993: 58 FR 51144.

TABLE 4(B).—SUMMARY OF LISTING ACTIONS FOR 81 PLANT SPECIES FROM KAUAI AND NIIHAU

Species	Federal status	Proposed rule		Final rule	
		Date	Federal Register	Date	Federal Register
Adenophorus periens	E	09/14/1993	58 FR 48012	11/10/1994	59 FR 56333.
Alectryon macrococcus	E	05/24/1991	56 FR 23842	05/15/1992	57 FR 20772.
Alsinidendron lychnoides	E	09/25/1995	60 FR 49359	10/10/1996	56 FR 53070.
Alsinidendron viscosum	E	09/25/1995	60 FR 49359	10/10/1996	61 FR 53070.
Bonamia menziesii	E	09/14/1993	58 FR 48012	11/10/1994	59 FR 56333.
Brighamia insignis	E	10/30/1991	56 FR 5562	02/25/1994	59 FR 09304.
Centaurium sebaeoides	E	09/28/1990	55 FR 39664	10/29/1991	56 FR 55770.
Chamaesyce halemanui	E	09/21/1990	50 FR 39301	05/13/1992	57 FR 20580.
Cyanea asarifolia	E	10/30/1991	56 FR 5562	02/25/1994	59 FR 09304.
Cyanea recta	T	09/25/1995	60 FR 49359	10/10/1996	61 FR 53070.
Cyanea remyi	E	09/25/1995	60 FR 49359	10/10/1996	61 FR 53070.
Cyanea undulata	E	09/17/1990	55 FR 38242	09/20/1991	56 FR 47695.
Cyperus trachysanthos	E	10/02/1995	60 FR 51417	10/10/1996	61 FR 53108
Cyrtandra cyaneoides	E	09/25/1995	60 FR 49359	10/10/1996	61 FR 53070.

TABLE 4(B).—SUMMARY OF LISTING ACTIONS FOR 81 PLANT SPECIES FROM KAUAI AND NIIHAU—Continued

Species	Federal status	Proposed rule		Final rule	
		Date	Federal Register	Date	Federal Register
Cyrtandra limahuliensis	T	10/30/1991	56 FR 5562	02/25/1994	59 FR 09304.
Delissea rhytidosperma	E	10/30/1991	56 FR 5562	02/25/1994	59 FR 09304.
Delissea rivularis	E	09/25/1995	60 FR 49359	10/10/1996	61 FR 53070.
Delissea undulata	E	06/27/1994	59 FR 32946	10/10/1996	61 FR 53124.
Diellia pallida	E	10/30/1991	56 FR 5562	02/25/1994	59 FR 09304.
Dubautia latifolia	E	09/21/1990	50 FR 39301	05/13/1992	57 FR 20580.
Dubautia pauciflorula	E	09/17/1990	55 FR 38242	09/20/1991	56 FR 47695.
Euphorbia haeleeleana	E	10/02/1995	60 FR 51417	10/10/1996	61 FR 53108.
Exocarpos luteolus	E	10/30/1991	56 FR 5562	02/25/1994	59 FR 09304.
Flueggea neowawraea	E	09/14/1993	58 FR 48012	11/10/1994	59 FR 56333.
Gouania meyenii	E	09/28/1990	55 FR 39664	10/29/1991	56 FR 55770.
Hedyotis cookiana	E	10/30/1991	56 FR 5562	02/25/1994	59 FR 09304.
Hedyotis st.-johnii	E	08/03/1990	55 FR 31612	09/30/1991	56 FR 49639.
Hesperomannia lydgatei	E	09/17/1990	55 FR 38242	09/20/1991	56 FR 47695.
Hibiscadelphus woodii	E	09/25/1995	60 FR 49359	10/10/1996	61 FR 53070.
Hibiscus clayi	E	10/30/1991	56 FR 5562	02/25/1994	59 FR 09304.
Hibiscus waimeae ssp. hannerae	E	09/25/1995	60 FR 49359	10/10/1996	61 FR 53070.
Isodendrion laurifolium	E	10/02/1995	60 FR 51417	10/10/1996	61 FR 53108.
Isodendrion longifolium	T	10/02/1995	60 FR 51417	10/10/1996	61 FR 53108.
Kokia kauaiensis	E	09/25/1995	60 FR 49359	10/10/1996	61 FR 53070.
Labordia lydgatei	E	09/17/1990	55 FR 38242	09/20/1991	56 FR 47695.
Labordia tinifolia var. wahiawaensis	E	09/25/1995	60 FR 49359	10/10/1996	61 FR 53070.
Lipochaeta fauriei	E	10/30/1991	56 FR 5562	02/25/1994	59 FR 09304.
Lipochaeta micrantha	E	10/30/1991	56 FR 5562	02/25/1994	59 FR 09304.
Lipochaeta waimeaensis	E	10/30/1991	56 FR 5562	02/25/1994	59 FR 09304.
Lobelia niihauensis	E	09/28/1990	55 FR 39664	10/29/1991	56 FR 55770.
Lysimachia filifolia	E	10/30/1991	56 FR 5562	02/25/1994	59 FR 09304.
Melicope haupuensis	E	10/30/1991	56 FR 5562	02/25/1994	59 FR 09304.
Melicope knudsenii	E	10/30/1991	56 FR 5562	02/25/1994	59 FR 09304.
Melicope pallida	E	10/30/1991	56 FR 5562	02/25/1994	59 FR 09304.
Melicope quadrangularis	E	10/30/1991	56 FR 5562	02/25/1994	59 FR 09304.
Munroidendron racemosum	E	10/30/1991	56 FR 5562	02/25/1994	59 FR 09304.
Myrsine linearifolia	T	09/25/1995	60 FR 49359	10/10/1996	61 FR 53070.
Nothocestrum peltatum	E	10/30/1991	56 FR 5562	02/25/1994	59 FR 09304.
Panicum niihauense	E	10/02/1995	60 FR 51417	10/10/1996	61 FR 53108.
Peucedanum sandwicense	T	10/30/1991	56 FR 5562	02/25/1994	59 FR 09304.
Phyllostegia knudsenii	E	09/25/1995	60 FR 49359	10/10/1996	61 FR 53070.
Phyllostegia waimeae	E	10/30/1991	56 FR 5562	02/25/1994	59 FR 09304.
Phyllostegia wawrana	E	09/25/1995	60 FR 49359	10/10/1996	61 FR 53070.
Plantago princeps	E	09/14/1993	58 FR 48012	11/10/1994	59 FR 56333.
Platanthera holochila	E	10/02/1995	60 FR 51417	10/10/1996	61 FR 53108.
Poa mannii	E	04/07/1993	58 FR 18073	11/10/1994	59 FR 56330.
Poa sandvicensis	E	09/21/1990	50 FR 39301	05/13/1992	57 FR 20580.
Poa siphonoglossa	E	09/21/1990	50 FR 39301	05/13/1992	57 FR 20580.
Pritchardia aylmer-robinsonii	E	12/17/1992	57 FR 59970	08/07/1996	61 FR 41020.
Pritchardia napaliensis	E	09/25/1995	60 FR 49359	10/10/1996	61 FR 53070.
Pritchardia viscosa	E	09/25/1995	60 FR 49359	10/10/1996	61 FR 53070.
Pteralyxia kauaiensis	E	10/30/1991	56 FR 5562	02/25/1994	59 FR 09304.
Remya kauaiensis	E	10/02/1989	54 FR 40447	01/14/1991	56 FR 1450.
Remya montgomeryi	E	10/02/1989	54 FR 40447	01/14/1991	56 FR 1450.
Schiedea apokremnos	E	08/03/1990	55 FR 31612	09/30/1991	56 FR 49639.
Schiedea helleri	E	09/25/1995	60 FR 49359	10/10/1996	61 FR 53070.
Schiedea kauaiensis	E	10/02/1995	60 FR 51417	10/10/1996	61 FR 53108.
Schiedea membranacea	E	09/25/1995	60 FR 49359	10/10/1996	61 FR 53070.
Schiedea nuttallii	E	10/02/1995	60 FR 51417	10/10/1996	61 FR 53108.
Schiedea spergulina var. leiopoda	E	10/30/1991	56 FR 5562	02/25/1994	59 FR 09304.
Schiedea spergulina var. spergulina	T	10/30/1991	56 FR 5562	02/25/1994	59 FR 09304.
Schiedea stellarioides	E	09/25/1995	60 FR 49359	10/10/1996	61 FR 53070.
Sesbania tomentosa	E	09/14/1993	58 FR 48012	11/10/1994	59 FR 56333.
Solanum sandwicense	E	10/30/1991	56 FR 5562	02/25/1994	59 FR 09304.
Spermolepis hawaiiensis	E	09/14/1993	58 FR 48012	11/10/1994	59 FR 56333.
Stenogyne campanulata	E	09/21/1990	50 FR 39301	05/13/1992	57 FR 20580.
Viola helenae	E	09/17/1990	55 FR 38242	09/20/1991	56 FR 47695.
Viola kauaiensis var. wahiawaensis	E	09/25/1995	60 FR 49359	10/10/1996	61 FR 53070.
Wilkesia hobdyi	E	10/02/1989	54 FR 40444	06/22/1992	57 FR 27859.
Xylosma crenatum	E	09/21/1990	50 FR 39301	05/13/1992	57 FR 20580.
Zanthoxylum hawaiiense	E	12/17/1992	57 FR 59951	03/04/1994	59 FR 10305.

Key: E = Endangered; T = Threatened.

Section 4(a)(3) of the Act, as amended, and implementing regulations (50 CFR 424.12) require that, to the maximum extent prudent and determinable, the Secretary designate critical habitat at the time the species is determined to be endangered or threatened. Our regulations (50 CFR 424.12(a)(1)) state that designation of critical habitat is not prudent when one or both of the following situations exist: (1) The species is threatened by taking or other human activity, and identification of critical habitat can be expected to increase the degree of threat to the species, or (2) such designation of critical habitat would not be beneficial to the species. At the time each plant was listed, we determined that designation of critical habitat was not prudent because it would not benefit the plant and/or would increase the degree of threat to the species.

These not prudent determinations were challenged in *Conservation Council for Hawaii* v. *Babbitt,* 2 F. Supp. 2d 1280 (D. Haw. 1988). On March 9, 1998, the United States District Court for the District of Hawaii, directed us to review the prudency determinations for 245 listed plant species in Hawaii, including these 81 species. Among other things, the court held that in most cases we did not sufficiently demonstrate that the species are threatened by human activity or that such threats would increase with the designation of critical habitat. The court also held that we failed to balance any risks of designating critical habitat against any benefits (2 F. Supp. 2d 1283–1285). For example, the court suggested that, before concluding critical habitat would not be prudent, the Service should consider whether designation might prevent an inadvertent act of destruction by educating the public.

Regarding our determination that designating critical habitat would have no additional benefits to the species above and beyond those already provided through the section 7 consultation requirement of the Act, the court ruled that we failed to consider the specific effect of the consultation requirement on each species (*Id.* at 1286–88). In addition, the court stated that we did not consider benefits outside of the consultation requirements. In the court's view, these potential benefits include substantive and procedural protections. The court held that, substantively, designation establishes a ''uniform protection plan'' prior to consultation and indicates where compliance with section 7 of the Act is required. Procedurally, the court stated that the designation of critical habitat educates the public and State and local governments and affords them an opportunity to participate in the designation (*Id.* at 1288). The court also stated that private lands may not be excluded from critical habitat designation even though section 7 requirements apply only to Federal agencies. In addition to the potential benefit of informing the public and State and local governments of the listing and of the areas that are essential to the species' conservation, the court found that although no Federal activity may be occurring on private property at present, there may be such activity in the future (*Id.* at 1285–88).

On August 10, 1998, the court ordered us to publish proposed critical habitat designations or non-designations for at least 100 species by November 30, 2000, and to publish proposed designations or non-designations for the remaining 145 species by April 30, 2002 (24 F. Supp. 2d 1074). This rule responds to the court's order.

On November 30, 1998, we published a notice in the **Federal Register** requesting public comments on our reevaluation of whether designation of critical habitat is prudent for the 245 Hawaiian plants at issue (63 FR 65805). The comment period closed on March 1, 1999, and was reopened from March 24, 1999, to May 24, 1999 (64 FR 14209). We received over 100 responses from individuals, non-profit organizations, county governments, the State of Hawaii's Division of Forestry and Wildlife, and Federal agencies (U.S. Department of Defense (Army, Navy, Air Force)). Only a few responses offered information on the status of individual plant species or on current management actions for one or more of the 245 Hawaiian plants. While many of the respondents expressed support for the designation of critical habitat for 245 Hawaiian plants, more than 80% opposed the designation of critical habitat for these plants. In general, these respondents opposed designation because they believed it will cause economic hardship, negatively impact cooperative projects, polarize relationships with hunters, or potentially increase the occurrences of trespassing or vandalism on private lands. In addition, commenters cited a lack of information on the biological and ecological needs of these plants which may lead to designation based on insufficient data. The respondents who supported the designation of critical habitat cited that designation would provide a uniform protection plan for the Hawaiian Islands; promote funding for management of these plants; educate the public and State government; and protect partnerships with landowners and build trust.

On October 5, 1999, we mailed letters to over 160 landowners on the islands of Kauai and Niihau requesting any information considered germane to the management of any of the 245 plants on his/her property. The letters contained a copy of the November 30, 1998, **Federal Register** notice, a map showing the general locations of the plants that may be on his/her property, and a handout containing general information on critical habitat. We received 25 written responses to our landowner mailing with varying types of information on their current land management activities. These responses included information on: the presence of fences or locked gates to restrict public access; access to the respondent's property by hunters or if hunting is allowed on the property; ongoing weeding and rat control programs; and the propagation and/or planting of native plants. Some respondents stated that the plants of concern were not on her/his property. Only a few respondents expressed support for the designation of critical habitat. We held three open houses on the island of Kauai, at the Waimea Community Center, the Kauai War Memorial Convention Hall in Lihue, and the Kilauea Neighborhood Center, on October 19–21, 1999, respectively, to meet one-on-one with local landowners and other interested members of the public. A total of forty-eight people attended the three open houses.

Critical Habitat

Critical habitat is defined in section 3 of the Act as: (i) The specific areas within the geographic area occupied by a species, at the time it is listed in accordance with the Act, on which are found those physical or biological features (I) essential to the conservation of the species and (II) that may require special management considerations or protection; and (ii) specific areas outside the geographic area occupied by a species at the time it is listed, upon a determination that such areas are essential for the conservation of the species. ''Conservation'' means the use of all methods and procedures that are necessary to bring an endangered species or a threatened species to the point at which listing under the Act is no longer necessary.

Section 4(b)(2) of the Act requires that we base critical habitat proposals upon the best scientific and commercial data available, after taking into consideration the economic impact, and any other relevant impact, of specifying any particular area as critical habitat. We may exclude areas from critical habitat

designation when the benefits of exclusion outweigh the benefits of including the areas within critical habitat, provided the exclusion will not result in extinction of the species (section 4(b)(2) of the Act).

Designation of critical habitat can help focus conservation activities for a listed species by identifying areas that contain the physical and biological features that are essential for conservation of that species. Designation of critical habitat alerts the public as well as land-managing agencies to the importance of these areas.

Critical habitat also identifies areas that may require special management considerations or protection, and may provide protection to areas where significant threats to the species have been identified. Critical habitat receives protection from destruction or adverse modification through required consultation under section 7 of the Act with regard to actions carried out, funded, or authorized by a Federal agency. Section 7 also requires conferences on Federal actions that are likely to result in the adverse modification or destruction of proposed critical habitat. Aside from the protection that may be provided under section 7, the Act does not provide other forms of protection to lands designated as critical habitat.

Section 7(a)(2) of the Act requires Federal agencies to consult with us to ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of a threatened or endangered species, or result in the destruction or adverse modification of critical habitat. In 50 CFR 402.02, ''jeopardize the continued existence'' (of a species) is defined as engaging in an activity likely to result in an appreciable reduction in the likelihood of survival and recovery of a listed species. ''Destruction or adverse modification'' (of critical habitat) is defined as a direct or indirect alteration that appreciably diminishes the value of critical habitat for the survival and recovery of the listed species for which critical habitat was designated. Thus, the definitions of ''jeopardy'' to the species and ''adverse modification'' of critical habitat are nearly identical.

Designating critical habitat does not, in itself, lead to recovery of a listed species. Designation does not create a management plan, establish numerical population goals, prescribe specific management actions (inside or outside of critical habitat), or directly affect areas not designated as critical habitat. Specific management recommendations for areas designated as critical habitat are most appropriately addressed in recovery, conservation, and management plans, and through section 7 consultations and section 10 permits.

A. Prudency Redetermination

As previously stated, designation of critical habitat is not prudent when one or both of the following situations exist: (i) The species is threatened by taking or other human activity, and identification of critical habitat can be expected to increase the degree of such threat to the species; or (ii) such designation of critical habitat would not be beneficial to the species (50 CFR 424.12(a)(1)).

To determine whether critical habitat would be prudent for each species, we analyzed the potential threats and benefits for each species in accordance with the court's order. Two species, *Phyllostegia waimeae* and *Melicope quadrangularis,* both endemic to the island of Kauai, are no longer extant in the wild. *Phyllostegia waimeae* was last collected in 1969 and no individuals were seen in two subsequent visits (1991 and 1992) to the last known location (Wagner *et al.* 1999; K. Wood, pers. comm. 2000). *Melicope quadrangularis* was last observed in the Wahiawa drainage area in 1991. This species has not been seen in surveys of this area subsequent to Hurricane Iniki in 1992 (S. Perlman and K. Wood, pers. comm. 2000). In addition, neither species is known to be in storage or under propagation. Therefore, we believe both species may be extinct. Under these circumstances, we propose that designation of critical habitat for *Phyllostegia waimeae* and *Melicope quadrangularis* is not prudent because such designation would be of no benefit to these species. If either species is rediscovered we may revise this proposal to incorporate or address new information as new data becomes available (*See* 16 U.S.C. § 1532 (5)(B); 50 CFR 424.13(f)).

Due to low numbers of individuals and/or populations and their inherent immobility, the other 79 plants may be vulnerable to unrestricted collection, vandalism, or disturbance. We examined the evidence currently available for each of these taxa and found specific evidence of vandalism, disturbance, and/or the threat of unrestricted collection for three species of *Pritchardia,* the native palm, on Kauai and Niihau. At the time of listing we determined that designation of critical habitat was not prudent for *Pritchardia napaliensis, P. aylmer-robinsonii,* and *P. viscosa* because it would increase the degree of threat from vandalism or collecting, and would provide no benefits (60 FR 53070). At that time, we had information that at least one of the remaining adult plants has been damaged by spiked boots used either by a botanist or seed collector to scale these trees (61 FR 53070). Since publication of the listing rule, we learned of additional instances of vandalism, collection, and commercial trade involving these three species of *Pritchardia.* In 1993, the State's DOFAW planted 39 young *Pritchardia napaliensis* plants within a fenced exclosure near the Wailua River. A short time after this, the fence was vandalized and all 39 plants were removed (A. Kyono, pers. comm. 2000; Craig Koga, DOFAW, **in litt.** 1999). In mid-1996, a young plant and seeds of *Pritchardia viscosa* were removed from the only known location of this species (A. Kyono, pers. comm. 2000; C. Koga, *in litt.* 1999). Recently we received information on the commercial trade in palms conducted through the internet (Grant Canterbury, USFWS, *in litt.* 2000). Several nurseries advertise and sell seedlings and young plants, including 13 species of Hawaiian *Pritchardia.* Seven of these species are federally protected, including *Pritchardia aylmer-robinsonii* and *P. napaliensis.*

In light of this information, we believe that designation of critical habitat would likely increase the threat to these three species of *Pritchardia* on Kauai and Niihau from vandalism or collection. These plants are easy to identify, and they are attractive to collectors of rare palms either for their personal use or to trade or sell for personal gain (Johnson 1996). The final listing rules for these three species contained only general information on their distribution, but the publication of precise maps and descriptions of critical habitat in the **Federal Register** would make these species more vulnerable to incidents of vandalism or collection, and, therefore, contribute to the decline of these species and make recovery more difficult (61 FR 53070).

In addition, we believe that designation would not provide significant benefits that would outweigh these increased risks. First, *Pritchardia napaliensis* and *P. viscosa* do not occur on Federal land, and the State lands where they are found are zoned for conservation. Some of the plants are on lands set aside in perpetuity to conserve their natural flora and fauna, or as geological sites (State of Hawaii natural area reserves) (HRS § 195–1). In addition, these species are found in areas that are remote and accessible only by four-wheel drive (*Pritchardia viscosa* only), foot, boat, or helicopter. It

is, therefore, unlikely that the lands on which these species are found will be developed. Since there do not appear to be any actions in the future that would involve a Federal agency, designation of critical habitat would not provide any additional protection to the species than they do not already have through listing alone. If, however, in the future any Federal involvement did occur, such as through the permitting process or funding by the U.S. Department of Agriculture, the U.S. Department of Interior, the Corps through section 404 of the Clean Water Act, the U.S. Federal Department of Housing and Urban Development or the Federal Highway Administration, the actions would be subject to consultation under section 7 of the Act.

Pritchardia aylmer-robinsonii is only found on Niihau, which is presently zoned for agriculture. There are no hotels, resorts, or other commercial development on the island. Public access to the island is not generally authorized by the landowner. Most of the people living on this island (fewer than 300) are employed in ranching activities (Department of Geography 1998). While future activities on the island are unknown, it is unlikely that the land on which this species is found will be developed. Future projects that would require Federal permitting or funding such as those mentioned above are particularly unlikely on this privately owned island. Although access to the island has been and continues to be restricted, *P. aylmer-robinsonii* is endemic only to Niihau, so any commercial availability indicates that collection, either with or without the land owner's permission, has occurred in the past and may still be occurring.

We acknowledge that critical habitat designation, in some situations, may provide some value to the species, for example, by identifying areas important for conservation and calling attention to those areas in need of special protection. However, for these three species, we believe that the benefits of designating critical habitat do not outweigh the potential increased threats from vandalism or collection. Given all of the above considerations, we propose that designation of critical habitat for *Pritchardia aylmer-robinsonii, P. napaliensis,* and *P. viscosa* is not prudent.

We examined the evidence available for the other 76 taxa and have not, at this time, found specific evidence of taking, vandalism, collection or trade of these taxa or of similar species. Consequently, while we remain concerned that these activities could potentially threaten these 76 plant species in the future, consistent with applicable regulations (50 CFR 424.12(a)(1)(i)) and the court's discussion of these regulations, we do not find that any of these species are currently threatened by taking or other human activity, which would be exacerbated by the designation of critical habitat.

In the absence of finding that critical habitat would increase threats to a species, if there are any benefits to critical habitat designation, then a prudent finding is warranted. The potential benefits include: (1) Triggering section 7 consultation in new areas where it would not otherwise occur because, for example, it is or has become unoccupied; (2) focusing conservation activities; (3) providing educational benefits to State or county governments or private entities; and (4) preventing people from causing inadvertent harm to the species.

In the case of these 76 species, there would be some benefits to critical habitat. The primary regulatory effect of critical habitat is the section 7 requirement that Federal agencies refrain from taking any action that destroys or adversely affects critical habitat. At least eleven of these species are reported on or near Federal lands (see Table 3), where actions are subject to section 7 consultation. Although a majority of the species considered in this rule are located exclusively on non-Federal lands with limited Federal activities, there could be Federal actions affecting these lands in the future. While a critical habitat designation for habitat currently occupied by these species would not likely change the section 7 consultation outcome, since an action that destroys or adversely modifies such critical habitat would also be likely to result in jeopardy to the species, there may be instances where section 7 consultation would be triggered only if critical habitat were designated. There would also be some educational or informational benefits to the designation of critical habitat. Benefits of designation would include the notification of land owners, land managers, and the general public of the importance of protecting the habitat of these species and dissemination of information regarding their essential habitat requirements.

Therefore, we propose that designation of critical habitat is prudent for these 76 plant species: *Adenophorus periens, Alectryon macrococcus, Alsinidendron lychnoides, Alsinidendron viscosum, Bonamia menziesii, Brighamia insignis, Centaurium sebaeoides, Chamaesyce halemanui, Cyanea asarifolia, Cyanea recta, Cyanea remyi, Cyanea undulata, Cyperus trachysanthos, Cyrtandra cyaneoides, Cyrtandra limahuliensis, Delissea rhytidosperma, Delissea rivularis, Delissea undulata, Diellia pallida, Dubautia latifolia, Dubautia pauciflorula, Euphorbia haeleeleana, Exocarpos luteolus, Flueggea neowawraea, Gouania meyenii, Hedyotis cookiana, Hedyotis st.-johnii, Hesperomannia lydgatei, Hibiscadelphus woodii, Hibiscus clayi, Hibiscus waimeae* ssp. *hannerae, Isodendrion laurifolium, Isodendrion longifolium, Kokia kauaiensis, Labordia lydgatei, Labordia tinifolia* var. *wahiawaensis, Lipochaeta fauriei, Lipochaeta micrantha, Lipochaeta waimeaensis, Lobelia niihauensis, Lysimachia filifolia, Melicope haupuensis, Melicope knudsenii, Melicope pallida, Munroidendron racemosum, Myrsine linearifolia, Nothocestrum peltatum, Panicum niihauense, Peucedanum sandwicense, Phyllostegia knudsenii, Phyllostegia wawrana, Plantago princeps, Platanthera holochila, Poa mannii, Poa sandvicensis, Poa siphonoglossa, Pteralyxia kauaiensis, Remya kauaiensis, Remya montgomeryi, Schiedea apokremnos, Schiedea helleri, Schiedea kauaiensis, Schiedea membranacea, Schiedea nuttallii, Schiedea spergulina* var. *leiopoda, Schiedea spergulina* var. *spergulina, Schiedea stellarioides, Sesbania tomentosa, Solanum sandwicense, Spermolepis hawaiiensis, Stenogyne campanulata, Viola helenae, Viola kauaiensis* var. *wahiawaensis, Wilkesia hobdyi, Xylosma crenatum,* and *Zanthoxylum hawaiiense.*

B. Primary Constituent Elements

In accordance with section 4(b)(2) of the Act and regulations at 50 CFR 424.12, in determining which areas to propose as critical habitat, we are required to base critical habitat determinations on the best scientific and commercial data available and to consider those physical and biological features that are essential to the conservation of the species and that may require special management considerations or protection. Such requirements include, but are not limited to, space for individual and population growth, and for normal behavior; food, water, air, light, minerals, or other nutritional or physiological requirements; cover or shelter; sites for breeding, reproduction, or rearing of offspring, germination, or seed dispersal; and habitats that are protected from disturbance or are representative of the historic

geographical and ecological distributions of a species.

Very little is known about the specific physical and biological requirements of most of these 76 species. Therefore, we have defined primary constituent elements on the basis of general habitat features of the areas in which the species currently occur, such as the plant community associated with the listed species and the species' physical location (*e.g.,* steep rocky cliffs, talus slopes, stream banks, and elevation). Areas outside the currently known occupied areas (*e.g.,* potentially suitable unoccupied habitat) may be important to the recovery of most of these 76 species. However, in most cases, we have not included such areas in the proposed designations for these species because of our limited knowledge of the historical range (*i.e.,* the geographical area they once occupied but from which they are now absent) and our lack of information on the physical or biological features essential for the conservation of a species. The Service considers reintroduction (the planting of propagated individuals or seedlings into an area) to be an acceptable method to try to achieve plant species recovery. Native plant reintroductions are, however, difficult and successful efforts are not common. We do not know enough about these 76 species to identify areas where reintroductions are likely to be successful. We will continue to support experimental efforts to reintroduce species. Such reintroduction work may lead to the need to designate unoccupied habitat in the future to provide additional protection to the reintroduced plants. The areas we are currently proposing to designate as critical habitat provide some or all of the habitat components essential for the conservation of the 76 plant species.

The plant communities given in the following descriptions of primary constituent elements are based upon biological and physical features such as predominant plant species, associated plant species, elevation, precipitation, and soil types and/or parent material. Descriptions of these Hawaiian plant communities are found in Gagne and Cuddihy (1999).

Species Endemic to Kauai

The currently known primary constituent elements of critical habitat for *Alsinidendron lychnoides* are:

(1) montane wet forests

(a) dominated by *Metrosideros polymorpha* and *Cheirodendron* sp., or by *M. polymorpha* and *Dicranopteris linearis,* and

(b) containing one or more of the following native plant species: *Carex* sp., *Cyrtandra* sp., *Machaerina* sp., *Vaccinium* sp., *Peperomia* sp., *Hedyotis terminalis, Astelia* sp., or *Broussaisia arguta;* and

(2) elevations between 1,100 and 1,320 m (3,610 and 4,330 ft).

The currently known primary constituent elements of critical habitat for *Alsinidendron viscosum* are:

(1) steep slopes

(a) in *Acacia koa-Metrosideros polymorpha* lowland, montane mesic, or wet forest, and

(b) containing one or more of the following native plant species: *Alyxia olivaeformis, Bidens cosmoides, Bobea* sp., *Carex* sp., *Coprosma* sp., *Dodonaea viscosa, Gahnia* sp., *Ilex anomala, Melicope* sp., *Pleomele* sp., *Psychotria* sp., or *Schiedea stellarioides;* and

(2) elevations between 820 and 1,200 m (2,700 and 3,940 ft).

The currently known primary constituent elements of critical habitat for *Chamaesyce halemanui* are:

(1) steep slopes of gulches

(a) in mesic *Acacia koa* forests, and

(b) containing one or more of the following native plant species: *Metrosideros polymorpha, Alphitonia ponderosa, Antidesma platyphyllum, Bobea brevipes, Cheirodendron trigynum, Coprosma* sp., *Diospyros sandwicensis, Dodonaea viscosa, Elaeocarpus bifidus, Hedyotis terminalis, Kokia kauaiensis, Melicope haupuensis, Pisonia* sp., *Pittosporum* sp., *Pleomele aurea, Psychotria mariniana, Psychotria greenwelliae, Pouteria sandwicensis, Santalum freycinetianum,* or *Styphelia tameiameiae;* and

(2) elevations between 660 to 1,100 m (2,165 to 3,610 ft).

The currently known primary constituent elements of critical habitat for *Cyanea asarifolia* are:

(1) pockets of soil on sheer rock cliffs

(a) in lowland wet forests, and

(b) containing one or more of the following native plant species: *Hedyotis elatior, Machaerina angustifolia, Metrosideros polymorpha, Touchardia latifolia,* or *Urera glabra;* and

(2) elevations between 330 to 730 m (1,080 to 2,400 ft).

The currently known primary constituent elements of critical habitat for *Cyanea recta* are:

(1) gulches or slopes

(a) in lowland wet or mesic *Metrosideros polymorpha* forest or shrubland, and

(b) containing one or more of the following native plant species: *Antidesma* sp., *Cheirodendron platyphyllum, Cibotium* sp., *Dicranopteris linearis, Diplazium* sp., or *Psychotria* sp.; and

(2) elevations between 400 to 1,200 m (1,310 to 3,940 ft).

The currently known primary constituent elements of critical habitat for *Cyanea remyi* are:

(1) lowland wet forest or shrubland and containing one or more of the following native plant species: *Antidesma* sp., *Cheirodendron* sp., *Diospyros* sp., *Broussaisia arguta, Metrosideros polymorpha, Freycinetia arborea, Hedyotis terminalis, Machaerina angustifolia, Perrottetia sandwicensis, Psychotria hexandra,* or *Syzygium sandwicensis;* and

(2) elevations between 360 and 930 m (1,180 and 3,060 ft).

The currently known primary constituent elements of critical habitat for *Cyanea undulata* are:

(1) pristine, undisturbed sites along shady stream banks or steep to vertical slopes; and

(2) elevations between 630 to 800 m (2,070 to 2,625 ft).

The currently known primary constituent elements of critical habitat for *Cyrtandra cyaneoides* are:

(1) steep slopes or cliffs near streams or waterfalls

(a) in lowland or montane wet forest or shrubland dominated by *Metrosideros polymorpha* or a mixture of *M. polymorpha* and *Dicranopteris linearis,* and

(b) containing one or more of the following native species: *Perrottetia sandwicensis, Pipturus* sp., *Bidens* sp., *Psychotria* sp., *Pritchardia* sp., *Freycinetia arborea, Cyanea* sp., *Cyrtandra limahuliensis, Diplazium sandwichianum, Gunnera* sp., *Coprosma* sp., *Stenogyne* sp., *Machaerina* sp., *Boehmeria grandis, Pipturus* sp., *Cheirodendron* sp., *Hedyotis terminalis,* or *Hedyotis tryblium;* and

(2) elevations between 550 and 1,220 meter (1,800 and 4,000 ft).

The currently known primary constituent elements of critical habitat for *Cyrtandra limahuliensis* are:

(1) stream banks

(a) in lowland wet forests, and

(b) containing one or more of the following native plant species: *Antidesma* sp., *Cyrtandra kealiea, Pisonia* sp., *Pipturus* sp., *Cibotium glaucum, Eugenia* sp., *Hedyotis terminalis, Dubautia* sp., *Boehmeria grandis, Touchardia latifolia, Bidens* sp., *Hibiscus waimeae, Charpentiera* sp., *Urera glabra, Pritchardia* sp., *Cyanea* sp., *Perrottetia sandwicensis, Metrosideros polymorpha, Dicranopteris linearis, Gunnera kauaiensis,* or *Psychotria* sp.; and

(2) elevations between 245 and 915 m (800 and 3,000 ft).

The currently known primary constituent elements of critical habitat for *Delissea rhytidosperma* are:

(1) well-drained soils with medium or fine-textured subsoil

(a) in diverse lowland mesic forests or *Acacia koa* dominated lowland dry forests, and

(b) containing one or more of the following native species: *Euphorbia haeleeleana, Psychotria hobdyi, Pisonia* sp., *Pteralyxia* sp., *Dodonaea viscosa, Cyanea* sp., *Hedyotis* sp., *Dianella sandwicensis, Diospyros sandwicensis, Styphelia tameiameiae,* or *Nestegis sandwicensis;* and

(2) elevations between 120 and 915 m (400 and 3,000 ft).

The currently known primary constituent elements of critical habitat for *Delissea rivularis* are:

(1) steep slopes near streams

(a) in *Metrosideros polymorpha—Cheirodendron trigynum* montane wet or mesic forest, and

(b) containing one or more of the following native plant species: *Broussaisia arguta, Carex* sp., *Coprosma* sp., *Melicope clusiifolia, M. anisata, Psychotria hexandra, Dubautia knudsenii, Diplazium sandwichianum, Hedyotis foggiana, Ilex anomala,* or *Sadleria* sp.; and

(2) elevations between 1,100 to 1,220 m (3,610 to 4,000 ft).

The currently known primary constituent elements of critical habitat for *Diellia pallida* are:

(1) bare soil on steep, rocky, dry slopes

(a) in lowland mesic forests, and

(b) containing one or more of the following native plant species: *Acacia koa, Alectryon macrococcus, Antidesma platyphyllum, Metrosideros polymorpha, Myrsine lanaiensis, Zanthoxylum dipetalum, Tetraplasandra kauaiensis, Psychotria mariniana, Carex meyenii, Diospyros hillebrandii, Hedyotis knudsenii, Canthium odoratum, Pteralyxia kauaiensis, Nestegis sandwicensis, Alyxia olivaeformis, Wilkesia gymnoxiphium, Alphitonia ponderosa, Styphelia tameiameiae,* or *Rauvolfia sandwicensis;* and

(2) elevations between 520 to 915 m (1,700 to 3,000 ft).

The currently known primary constituent elements of critical habitat for *Dubautia latifolia* are:

(1) gentle or steep slopes on well drained soil

(a) in semi-open or closed, diverse montane mesic forest dominated by *Acacia koa* and/or *Metrosideros polymorpha,* and

(b) containing one or more of the following native plant species: *Pouteria sandwicensis, Dodonaea viscosa, Nestegis sandwicensis, Diplazium sandwicensis, Elaeocarpus bifidus, Claoxylon sandwicense, Bobea* sp., *Pleomele* sp., *Antidesma* sp., *Cyrtandra* sp., *Xylosma* sp., *Alphitonia ponderosa, Coprosma waimeae, Dicranopteris linearis, Hedyotis terminalis, Ilex anomala, Melicope anisata, Psychotria mariniana,* or *Scaevola* sp.; and

(2) elevations between 800 to 1,220 m (2,625 to 4,000 ft).

The currently known primary constituent elements of critical habitat for *Dubautia pauciflorula* are:

(1) lowland wet forest within stream drainages; and

(2) elevations between 670–700m (2,200–2,300 ft).

The currently known primary constituent elements of critical habitat for *Exocarpos luteolus* are:

(1) wet areas bordering swamps and open, dry ridges

(a) in lowland or montane *Metrosideros polymorpha* dominated wet forest communities, and

(b) containing one or more of the following native plant species: *Acacia koa, Cheirodendron trigynum, Pouteria sandwicensis, Dodonaea viscosa, Pleomele aurea, Psychotria mariniana, Psychotria greenwelliae, Bobea brevipes, Hedyotis terminalis, Elaeocarpus bifidus, Melicope haupuensis, Dubautia laevigata, Dianella sandwicensis, Poa sandwicensis, Schiedea stellarioides, Peperomia macraeana, Claoxylon sandwicense, Santalum freycinetianum, Styphelia tameiameiae,* or *Dicranopteris linearis;* and

(2) elevations between 475 and 1,290 m (1,560 and 4,220 ft).

The currently known primary constituent elements of critical habitat for *Hedyotis st.-johnii* are:

(1) crevices of north-facing, near-vertical coastal cliff faces within the spray zone

(a) in sparse dry coastal shrubland, and

(b) containing one or more of the following native plant species: *Myoporum sandwicense, Eragrostis variabilis, Lycium sandwicense, Heteropogon contortus, Artemisia australis or Chamaesyce celastroides;* and

(2) elevations below 75 m (250 ft).

The currently known primary constituent elements of critical habitat for *Hesperomannia lydgatei* are:

(1) stream banks with rich brown soil and silty clay

(a) in *Metrosideros polymorpha* or *Metrosideros polymorpha-Dicranopteris linearis* lowland wet forest, and

(b) containing one or more of the following associated native plant species: *Adenophorus* sp., *Antidesma* sp., *Broussaisia arguta, Cheirodendron* sp., *Elaphoglossum* sp., *Freycinetia arborea, Hedyotis terminalis, Labordia lydgatei, Machaerina angustifolia, Peperomia* sp., *Pritchardia* sp., *Psychotria hexandra,* and *Syzygium sandwicensis;* and

(2) elevations between 410–915 m (1,345–3,000 ft).

The currently known primary constituent elements of critical habitat for *Hibiscadelphus woodii* are:

(1) basalt talus or cliff walls

(a) in *Metrosideros polymorpha* montane mesic forest, and

(b) containing one or more of the following associated native plant species: *Bidens sandwicensis, Artemisia australis, Melicope pallida, Dubautia* sp., *Lepidium serra, Lipochaeta* sp., *Lysimachia glutinosa, Carex meyenii, Chamaesyce celastroides* var. *hanapepensis, Hedyotis* sp., *Nototrichium* sp., *Panicum lineale, Myrsine* sp., *Stenogyne campanulata, Lobelia niihauensis,* or *Poa mannii;* and

(2) elevations around 915 m (3,000 ft).

The currently known primary constituent elements of critical habitat for *Hibiscus clayi* are:

(1) slopes

(a) in *Acacia koa* or *Diospyros* sp.-*Pisonia* sp.-*Metrosideros polymorpha* lowland dry or mesic forest, and

(b) containing one or more of the following associated native plant species: *Hedyotis acuminata, Pipturus* sp., *Psychotria* sp., *Cyanea hardyi, Artemisia australis,* or *Bidens* sp.; and

(2) elevations between 230 to 350 m (750 to 1,150 ft).

The currently known primary constituent elements of critical habitat for *Hibiscus waimeae* ssp. *hannerae* are:

(1) *Metrosideros polymorpha-Dicranopteris linearis* or *Pisonia* sp., *Charpentiera elliptica* lowland wet or mesic forest and containing one or more of the following associated native plant species: *Antidesma* sp., *Psychotria* sp., *Pipturus* sp., *Bidens* sp., *Bobea* sp., *Sadleria* sp., *Cyrtandra* sp., *Cyanea* sp., *Cibotium* sp., *Perrottetia sandwicensis,* or *Syzygium sandwicensis;* and

(2) elevations between 190 and 560 m (620 and 1,850 ft).

The currently known primary constituent elements of critical habitat for *Kokia kauaiensis* are:

(1) diverse mesic forest containing one or more of the following associated native plant species: *Acacia koa, Metrosideros polymorpha, Bobea* sp., *Diospyros sandwicensis, Hedyotis* sp., *Pleomele* sp., *Pisonia* sp., *Xylosma* sp., *Isodendrion* sp., *Syzygium*

sandwicensis, Antidesma sp., *Alyxia olivaeformis, Pouteria sandwicensis, Streblus pendulinus, Canthium odoratum, Nototrichium* sp., *Pteralyxia kauaiensis, Dicranopteris linearis, Hibiscus* sp., *Flueggea neowawraea, Rauvolfia sandwicensis, Melicope* sp., *Diellia laciniata, Tetraplasandra* sp., *Chamaesyce celastroides, Lipochaeta fauriei, Dodonaea viscosa, Santalum* sp., *Claoxylon* sp., or *Nestegis sandwicensis;* and

(2) elevations between 350–660 m (1,150–2,165 ft).

The currently known primary constituent elements of critical habitat for *Labordia lydgatei* are:

(1) *Metrosideros polymorpha-Dicranopteris linearis* lowland wet forest containing one or more of the following associated native plant species: *Psychotria* sp., *Hedyotis terminalis* sp., *Cyanea* sp., *Cyrtandra* sp., *Labordia hirtella, Antidesma platyphyllum var. hillebrandii, Syzygium sandwicensis, Ilex anomala,* or *Dubautia knudsenii;* and

(2) elevations between 635 and 855 m (2,080 to 2,800 ft).

The currently known primary constituent elements of critical habitat for *Labordia tinifolia* var. *wahiawaensis* are:

(1) streambanks

(a) in lowland wet forests dominated by *Metrosideros polymorpha,* and

(b) containing one or more of the following associated species: *Cheirodendron* sp., *Dicranopteris linearis, Cyrtandra* sp., *Antidesma* sp., *Psychotria* sp., *Hedyotis terminalis,* or *Athyrium microphyllum;* and

(2) elevations between 300 to 920 m (985 to 3,020 ft).

The currently known primary constituent elements of critical habitat for *Lipochaeta fauriei* are:

(1) moderate shade to full sun on the sides of steep gulches

(a) in diverse lowland mesic forests, and

(b) containing one or more of the following native species: *Diospyros* sp., *Myrsine lanaiensis, Euphorbia haeleeleana, Acacia koa, Pleomele aurea, Sapindus oahuensis, Nestegis sandwicensis, Dodonaea viscosa, Psychotria mariniana, Psychotria greenwelliae, Kokia kauaiensis,* or *Hibiscus waimeae;* and

(2) elevations between 480 to 900 m (1,575 to 2,950 ft).

The currently known primary constituent elements of critical habitat for *Lipochaeta micrantha* var. *exigua* are:

(1) cliffs, ridges, or slopes

(a) in grassy, shrubby or dry mixed communities, and

(b) containing one or more of the following associated native plant species: *Artemisia australis, Bidens sandvicensis, Plectranthus parviflorus, Chamaesyce celastroides, Diospyros* sp., *Canthium odoratum, Neraudia* sp., *Pipturus* sp., *Hibiscus kokio, Sida fallax, Eragrostis* sp., *or Lepidium bidentatum;* and

(2) elevations between 305–430 m (1,000–1,400 ft).

The currently known primary constituent elements of critical habitat for *Lipochaeta micrantha* var. *micrantha* are:

(1) basalt cliffs, stream banks, or level ground

(a) in mesic or diverse *Metrosideros polymorpha-Diospyros* sp. forest, and

(b) containing one or more of the following associated native plant species: *Lobelia niihauensis, Chamaesyce celastroides* var. *hanapepensis, Neraudia kauaiensis, Rumex* sp., *Nontrichium* sp., *Artemisia* sp., *Dodonaea viscosa, Antidesma* sp., *Hibiscus* sp., *Xylosma* sp., *Pleomele* sp., *Melicope* sp., *Bobea* sp., and *Acacia koa;* and

(2) elevations between 610–720 m (2,000–2,360 ft).

The currently known primary constituent elements of critical habitat for *Lipochaeta waimeaensis* are:

(1) extremely steep, shrub-covered gulches

(a) in diverse lowland forest, and

(b) containing the native species *Dodonaea viscosa* or *Lipochaeta connata;* and

(2) elevations between 350 to 400 m (1,150 to 1,310 ft).

The currently known primary constituent elements of critical habitat for *Melicope haupuensis* are:

(1) moist talus slopes

(a) in *Metrosideros polymorpha* dominated lowland mesic forests, or *Metrosideros polymorpha-Acacia koa* montane mesic forest and

(b) containing one or more of the following associated native plant species: *Dodonaea viscosa, Diospyros* sp., *Psychotria mariniana, P. greenwelliae, Melicope ovata, M. anisata, M. barbigera, Dianella sandwicensis, Pritchardia minor, Tetraplasandra waimeae, Claoxylon sandwicensis, Cheirodendron trigynum, Pleomele aurea, Cryptocarya mannii, Pouteria sandwicensis, Bobea brevipes, Hedyotis terminalis, Elaeocarpus bifidus,* or *Antidesma* sp; and

(2) elevations between 375 to 1,075 m (1,230 to 3,530 ft).

The currently known primary constituent elements of critical habitat for *Munroidendron racemosum* are:

(1) steep exposed cliffs or ridge slopes

(a) in coastal or lowland mesic forest, and

(b) containing one or more of the following associated plant taxa including: *Pisonia umbellifera, Canavalia galeata, Sida fallax, Brighamia insignis, Canthium odoratum, Psychotria* sp., *Nestegis sandwicensis, Tetraplasandra* sp., *Bobea timonioides, Rauvolfia sandwicensis, Pleomele* sp., *Pouteria sandwicensis,* or *Diospyros* sp.; and

(2) elevations between 120 to 400 m (395 to 1,310 ft).

The currently known primary constituent elements of critical habitat for *Myrsine linearifolia* are:

(1) diverse mesic or wet lowland or montane *Metrosideros polymorpha* forest

(a) with *Cheirodendron* sp. or *Dicranopteris linearis* as co-dominants, and

(b) containing one or more of the following associated native plant species: *Dubautia* sp., *Cryptocarya mannii, Sadleria pallida, Myrsine* sp., *Syzygium sandwicensis, Machaerina angustifolia, Freycinetia arborea, Hedyotis terminalis, Cheirodendron* sp., *Bobea brevipes, Nothocestrum* sp., *Melicope* sp., *Eurya sandwicensis, Psychotria* sp., *Lysimachia* sp., or native ferns; and

(2) elevations between 585 to 1,280 m (1,920 to 4,200 ft).

The currently known primary constituent elements of critical habitat for *Nothocestrum peltatum* are:

(1) fertile soil on steep slopes

(a) in montane or lowland mesic or wet forest dominated by *Acacia koa* or a mixture of *Acacia koa* and *Metrosideros polymorpha,* and

(b) containing one or more of the following associated native plant species: *Antidesma* sp., *Dicranopteris linearis, Bobea brevipes, Elaeocarpus bifidus, Alphitonia ponderosa, Melicope anisata, M. barbigera, M. haupuensis, Pouteria sandwicensis, Dodonaea viscosa, Dianella sandwicensis, Tetraplasandra Kauaiensis, Claoxylon sandwicensis, Cheirodendron trigynum, Psychotria mariniana, P. greenwelliae, Hedyotis terminalis, Ilex anomala, Xylosma* sp., *Cryptocarya mannii, Coprosma* sp., *Pleomele aurea, Diplazium sandwicensis, Broussaisia arguta,* or *Perrottetia sandwicensis;* and

(2) elevations between 915 to 1,220 m (3,000 to 4,000 ft).

The currently known primary constituent elements of critical habitat for *Panicum niihauense* are:

(1) sand dunes

(a) in coastal shrubland, and

(b) containing one or more of the following associated native plant

species: *Dodonaea viscosa, Cassytha filiformis, Scaevola sericea, Sida fallax, Vitex rotundifolia,* or *Sporobolus* sp.; and

(2) elevations of 100 m or less (330 ft).

The currently known primary constituent elements of critical habitat for *Phyllostegia knudsenii* are:

(1) *Metrosideros polymorpha* lowland mesic or wet forest containing one or more of the following associated native plant species: *Perrottetia sandwicensis, Cyrtandra kauaiensis, Cyrtandra paludosa, Elaeocarpus bifidus, Claoxylon sandwicensis, Cryptocarya mannii, Ilex anomala, Myrsine linearifolia, Bobea timonioides, Selaginella arbuscula, Diospyros* sp., *Zanthoxylum dipetalum, Pittosporum* sp., *Tetraplasandra* sp., *Pouteria sandwicensis,* or *Pritchardia minor;* and

(2) elevations between 865–975 m (2,840–3,200 ft).

The currently known primary constituent elements of critical habitat for *Phyllostegia wawrana* are:

(1) *Metrosideros polymorpha* dominated lowland or montane wet or mesic forest

(a) with *Cheirodendron* sp. or *Dicranopteris linearis* as co-dominants, and

(b) containing one or more of the following associated native plant species: *Delissea rivularis, Diplazium sandwichianum, Vaccinium* sp., *Broussaisia arguta, Myrsine lanaiensis, Psychotria* sp., *Dubautia knudsenii, Scaevola procera, Gunnera* sp., *Pleomele aurea, Claoxylon sandwicense, Elaphoglossum* sp., *Hedyotis* sp., *Sadleria* sp., and *Syzygium sandwicensis;* and

(2) elevations between 780–1,210 m (2,560–3,920 ft).

The currently known primary constituent elements of critical habitat for *Poa mannii* are:

(1) cliffs, rock faces, or stream banks

(a) in lowland or montane wet, dry, or mesic *Metrosideros polymorpha* or *Acacia koa-Metrosideros polymorpha* montane mesic forest, and

(b) containing one or more of the following associated native plant species: *Alectryon macrococcus, Antidesma platyphyllum, Bidens cosmoides, Chamaesyce celastroides* var. *hanapepensis, Artemisia australis, Bidens sandwicensis, Lobelia sandwicensis, Wilkesia gymnoxiphium, Eragrostis variabilis, Panicum lineale, Mariscus phloides, Luzula hawaiiensis, Carex meyenii, C. wahuensis, Cyrtandra wawrae, Dodonaea viscosa, Exocarpos luteolus, Labordia helleri, Nototrichium* sp., *Schiedea amplexicaulis, Hedyotis terminalis, Melicope anisata, M. barbigera, M. pallida, Pouteria sandwicensis, Schiedea membranacea, Diospyros sandwicensis, Psychotria mariniana, P. greenwelliae,* or *Kokia kauaiensis;* and

(2) elevations between 460 and 1,150 m (1,510 and 3,770 ft).

The currently known primary constituent elements of critical habitat for *Poa sandvicensis* are:

(1) wet, shaded, gentle or steep slopes, ridges, or rock ledges

(a) in semi-open or closed, mesic or wet, diverse montane forest dominated by *Metrosideros polymorpha,* and

(b) containing one or more of the following associated native species: *Dodonaea viscosa, Dubautia* sp., *Coprosma* sp., *Melicope* sp., *Dianella sandwicensis, Alyxia olivaeformis, Bidens* sp., *Dicranopteris linearis, Schiedea stellarioides, Peperomia macraeana, Claoxylon sandwicense, Acacia koa, Psychotria* sp., *Hedyotis* sp., *Scaevola* sp., *Cheirodendron* sp., or *Syzygium sandwicensis;* and

(2) elevations between 1,035 to 1,250 m (3,400 to 4,100 ft).

The currently known primary constituent elements of critical habitat for *Poa siphonoglossa* are:

(1) shady banks near ridge crests

(a) in mesic *Metrosideros polymorpha* forest, and

(b) containing one or more of the following associated native plant species: *Acacia koa, Psychotria* sp., *Scaevola* sp., *Alphitonia ponderosa, Zanthoxylum dipetalum, Tetraplasandra Kauaiensis, Dodonaea viscosa, Hedyotis* sp., *Melicope* sp., *Vaccinium* sp., *Styphelia tameiameiae, Carex meyenii, Carex wahuensis,* or *Wilkesia gymnoxiphium;* and

(2) elevations between 1,000 to 1,200 m (3,300 and 3,940 ft).

The currently known primary constituent elements of critical habitat for *Pteralyxia kauaiensis* are:

(1) diverse mesic or wet forests containing one or more of the following associated plant taxa: *Pisonia sandwicensis, Euphorbia haeleeleana, Charpentiera elliptica, Pipturus* sp., *Neraudia kauaiensis, Hedyotis terminalis, Pritchardia* sp., *Gardenia remyi, Syzygium* sp., *Pleomele* sp., *Cyanea* sp., *Hibiscus* sp., *Kokia kauaiensis, Alectryon macrococcus, Canthium odoratum, Nestegis sandwicensis, Bobea timonioides, Rauvolfia sandwicensis, Nesoluma polynesicum, Myrsine lanaiensis, Caesalpinia Kauaiensis, Tetraplasandra* sp., *Acacia koa, Styphelia tameiameiae, Dodonaea viscosa, Gahnia* sp., *Freycinetia arborea, Psychotria mariniana, Diplazium sandwichianum, Zanthoxylum dipetalum, Carex* sp., *Delissea* sp., *Xylosma hawaiiense, Alphitonia ponderosa, Santalum freycinetianum, Antidesma* sp., *Diospyros* sp., *Metrosideros polymorpha, Dianella sandwicensis, Poa sandwicensis, Schiedea stellarioides, Peperomia macraeana, Claoxylon sandwicense,* or *Pouteria sandwicensis;* and

(2) elevations between 250 to 610 m (810 to 2,000 ft).

The currently known primary constituent elements of critical habitat for *Remya kauaiensis* are:

(1) steep, north or northeast facing slopes

(a) in *Acacia koa-Metrosideros polymorpha* lowland mesic forest, and

(b) containing one or more of the following associated native plant species: *Chamaesyce* sp., *Nestegis sandwicensis, Diospyros* sp., *Hedyotis terminalis, Melicope* ssp., *Pouteria sandwicensis, Schiedea membranacea, Psychotria mariniana, Dodonaea viscosa, Dianella sandwicensis, Tetraplasandra kauaiensis* or *Claoxylon sandwicensis;* and

(2) elevations between 850 to 1,250 m (2,800 to 4,100 ft).

The currently known primary constituent elements of critical habitat for *Remya montgomeryi* are:

(1) steep, north or northeast-facing slopes, cliffs, or stream banks near waterfalls

(a) in *Metrosideros polymorpha* mixed mesic forest, and

(b) containing one or more of the following associated native plant species: *Lysimachia glutinosa, Lepidium serra, Boehmeria grandis, Poa mannii, Stenogyne campanulata, Myrsine linearifolia, Bobea timonioides, Ilex anomala, Zanthoxylum dipetalum, Claoxylon sandwicensis, Tetraplasandra* sp., *Artemisia* sp., *Nototrichium* sp., *Cyrtandra* sp., *Dubautia plantaginea, Sadleria* sp., *Cheirodendron* sp., *Scaevola* sp., or *Pleomele* sp.; and

(2) elevations between 850 to 1,250 m (2,800 to 4,100 ft).

The currently known primary constituent elements of critical habitat for *Schiedea apokremnos* are:

(1) crevices of near-vertical coastal cliff faces

(a) in sparse dry coastal shrub vegetation, and

(b) containing one or more of the following associated native plant species: *Heliotropium* sp., *Chamaesyce* sp., *Bidens* sp., *Artemisia australis, Lobelia niihauensis, Wilkesia hobdyi, Lipochaeta connata, Myoporum sandwicense, Canthium odoratum,* or *Peperomia* sp.; and

(2) elevations between 60 to 330 m (200 to 1,080 ft).

The currently known primary constituent elements of critical habitat for *Schiedea helleri* are:

(1) ridges and steep cliffs

(a) in closed *Metrosideros polymorpha-Dicranopteris linearis* montane wet forest, or *Metrosideros polymorpha-Cheirodendron* sp. montane wet forest, or *Acacia koa-Metrosideros polymorpha* montane mesic forest, and

(b) containing one or more of the following associated native plant species: *Dubautia raillardioides, Scaevola procera, Hedyotis terminalis, Syzygium sandwicensis, Melicope clusifolia, Cibotium* sp., *Broussaisia arguta, Cheirodendron* sp., *Cyanea hirtella, Dianella sandwicensis, Viola wailenalenae,* or *Poa sandwicensis;* and

(2) elevations between 1,065–1,100 m (3,490–3,610 ft).

The currently known primary constituent elements of critical habitat for *Schiedea kauaiensis* are:

(1) steep slopes

(a) in diverse mesic or wet forest, and

(b) containing one or more of the following associated plant taxa: *Psychotria mariniana, Psychotria hexandra, Canthium odoratum, Pisonia* sp., *Microlepia speluncae, Exocarpos luteolus, Diospyros* sp., *Peucedanum sandwicense,* or *Euphorbia haeleeleana;* and

(2) elevations between 680–790 m (2,230–2,590 ft).

The currently known primary constituent elements of critical habitat for *Schiedea membranacea* are:

(1) cliffs or cliff bases

(a) in mesic or wet habitats,

(b) in lowland, or montane shrubland, or forest communities dominated by *Acacia koa, Pipturus* sp. or *Metrosideros polymorpha,* and

(c) containing one or more of the following associated native plant species: *Hedyotis terminalis, Melicope* sp., *Pouteria sandwicensis, Poa mannii, Hibiscus waimeae, Psychotria mariniana, Canthium odoratum, Pisonia* sp., *Perrottetia sandwicensis, Scaevola procera, Sadleria cyatheoides, Diplazium sandwicensis, Thelypteris sandwicensis, Boehmeria grandis, Dodonaea viscosa, Myrsine* sp., *Bobea brevipes, Alyxia olivaeformis, Psychotria greenwelliae, Pleomele* sp., *Alphitonia ponderosa, Joinvillea ascendens* ssp. *ascendens, Athyrium sandwichianum, Machaerina angustifolia, Cyrtandra paludosa, Touchardia latifolia, Thelypteris cyatheoides, Lepidium serra, Eragrostis variabilis, Remya kauaiensis, Lysimachia kalalauensis, Labordia helleri, Mariscus pennatiformis, Asplenium praemorsum,* or *Poa sandvicensis;* and

(2) elevations between 520 and 1,160 m (1,700 and 3,800 ft).

The currently known primary constituent elements of critical habitat for *Schiedea spergulina* var. *leiopoda* are:

(1) bare rock outcrops or sparsely vegetated portions of rocky cliff faces or cliff bases

(a) in diverse lowland mesic forests, and

(b) containing one or more of the following native plants: *Bidens sandvicensis, Doryopteris* sp., *Peperomia leptostachya,* or *Plectranthus parviflorus;* and

(2) elevations between 180 and 800 m (590 and 2,625 ft).

The currently known primary constituent elements for *Schiedea spergulina* var. *spergulina* are:

(1) bare rock outcrops or sparsely vegetated portions of rocky cliff faces or cliff bases

(a) in diverse lowland mesic forests, and

(b) containing one or more of the following associated plant taxa: *Heliotropium* sp., or *Nototrichium sandwicense;* and

(2) elevations between 180 and 800 m (590 and 2,625 ft).

The currently known primary constituent elements of critical habitat for *Schiedea stellarioides* are:

(1) steep slopes

(a) in closed *Acacia koa-Metrosideros polymorpha* lowland or montane mesic forest or shrubland, and

(b) containing one or more of the following native plant species: *Nototrichium* sp., *Artemisia* sp., *Dodonaea viscosa, Melicope* sp., *Dianella sandwicensis, Bidens cosmoides, Mariscus* sp., or *Styphelia tameiameiae;* and

(2) elevations between 610 and 1,120 m (2,000 and 3,680 ft).

The currently known primary constituent elements of critical habitat for *Stenogyne campanulata* are:

(1) rock faces of nearly vertical, north-facing cliffs

(a) in diverse lowland or montane mesic forest, and

(b) containing one or more of the following associated native plant species: *Heliotropium* sp., *Lepidium serra, Lysimachia glutinosa, Perrottetia sandwicensis,* or *Remya montgomeryi;* and

(2) an elevation of 1,085 m (3,560 ft).

The currently known primary constituent elements of critical habitat for *Viola helenae* are:

(1) stream banks or adjacent valley bottoms with light to moderate shade in *Metrosideros polymorpha-Dicranopteris linearis* lowland wet forest; and

(2) elevations between 610–855 m (2,000–2,800 ft).

The currently known primary constituent elements of critical habitat for *Viola kauaiensis* var. *wahiawaensis* are:

(1) open montane bog or wet shrubland containing one or more of the following native plant species: *Dicranopteris linearis, Diplopterygium pinnatum, Syzygium sandwicensis,* or *Metrosideros polymorpha;* and

(2) elevations between 640 and 865 m (2,100 and 2,840 ft).

The currently known primary constituent elements of critical habitat for *Wilkesia hobdyi* are:

(1) coastal dry cliffs or very dry ridges containing one or more of the following associated native plant species: *Artemisia* sp., *Wilkesia gymnoxiphium, Lipochaeta connata, Lobelia niihauensis, Peucedanum sandwicensis, Hibiscus kokio* ssp. *saint johnianus, Canthium odoratum, Peperomia* sp., *Myoporum sandwicense, Sida fallax, Waltheria indica, Dodonaea viscosa,* or *Eragrostis variabilis;* and

(2) elevations between 275 to 400 m (900 to 1,310 ft).

The currently known primary constituent elements of critical habitat for *Xylosma crenatum* are:

(1) diverse *Acacia koa -Metrosideros polymorpha* montane mesic forest, or *M. polymorpha-Dicranopteris linearis* montane wet forest, or *A. koa -M. polymorpha* montane wet forest, and containing one or more of the following associated native plant species: *Tetraplasandra kauaiensis, Hedyotis terminalis, Pleomele aurea, Ilex anomala, Claoxylon sandwicense, Myrsine alyxifolia, Nestegis sandwicensis, Streblus pendulinus, Psychotria* sp., *Diplazium sandwichianum, Pouteria sandwicensis, Scaevola procera, Coprosma* sp., *Athyrium sandwichianum, Touchardia latifolia, Dubautia knudsenii, Cheirodendron* sp., *Lobelia yuccoides, Cyanea hirta, Poa sandwicensis,* or *Diplazium sandwichianum;* and

(2) elevations between 975 to 1,065 m (3,200 to 3,490 ft).

Multi Island Species

The currently known primary constituent elements of critical habitat for *Adenophorus periens* on Kauai are:

(1) well-developed, closed canopy that provides deep shade or high humidity

(a) in *Metrosideros polymorpha-Cibotium glaucum* lowland wet forests, open *M. polymorpha* montane wet

forest, or *M. polymorpha-Dicranopteris linearis* lowland wet forest, and

(b) containing one or more of the following native plant species: *Athyrium sandwicensis, Broussaisia* sp., *Cheirodendron trigynum, Cyanea* sp., *Cyrtandra* sp., *Dicranopteris linearis, Freycinetia arborea, Hedyotis terminalis, Labordia hirtella, Machaerina angustifolia, Psychotria* sp., *Psychotria hexandra,* or *Syzygium sandwicensis;* and

(2) elevations between 400 and 1,265 m (1,310 and 4,150 ft).

The currently known primary constituent elements of critical habitat for *Alectryon macrococcus* on Kauai are:

(1) dry slopes or gulches

(a) in *Diospyros* sp.-*Metrosideros polymorpha* lowland mesic forest, *M. polymorpha* mixed mesic forest, or *Diospyros* sp. mixed mesic forest, and

(b) containing one or more of the following native plant species: *Nestegis sandwicensis, Psychotria* sp., *Pisonia* sp., *Xylosma* sp., *Streblus pendulinus, Hibiscus* sp., *Antidesma* sp., *Pleomele* sp., *Acacia koa, Melicope knudsenii, Hibiscus waimeae, Pteralyxia* sp., *Zanthoxylum* sp., *Kokia Kauaiensis, Rauvolfia sandwicensis, Myrsine lanaiensis, Canthium odoratum, Canavalia* sp., *Alyxia olivaeformis, Nesoluma polynesicum, Munroidendron racemosum, Caesalpinia kauaiense, Tetraplasandra* sp., *Pouteria sandwicensis,* or *Bobea timonioides;* and

(2) elevations between 360 to 1,070 m (1,180 to 3,510 ft).

The currently known primary constituent elements of critical habitat for *Bonamia menziesii* on Kauai are:

(1) dry, mesic or wet forests containing one or more of the following native plant species: *Metrosideros polymorpha, Canthium odoratum, Dianella sandwicensis, Diospyros sandwicensis, Dodonaea viscosa, Hedyotis terminalis, Melicope anisata, Melicope barbigera, Myoporum sandwicense, Nestegis sandwicense, Pisonia* sp., *Pittosporum* sp., *Pouteria sandwicensis,* or *Sapindus oahuensis;* and

(2) elevations between 150 and 850 m (500 and 2,800 ft).

The currently known primary constituent elements of critical habitat for *Brighamia insignis* on both Kauai and Niihau are:

(1) rocky ledges with little soil or steep sea cliffs

(a) in lowland dry grasslands or shrublands with annual rainfall that is usually less than 170 cm (65 in.), and

(b) containing one or more of the following native plant species: *Artemisia* sp., *Chamaesyce celastroides, Canthium odoratum, Eragrostis variabilis, Heteropogon contortus, Hibiscus kokio, Hibiscus saintjohnianus, Lepidium serra, Lipochaeta succulenta, Munroidendron racemosum,* or *Sida fallax;* and

(2) elevations between sea level and 480 m (1,575 ft).

The currently known primary constituent elements of critical habitat for *Centaurium sebaeoides* on Kauai are:

(1) volcanic or clay soils or cliffs

(a) in arid coastal areas, and

(b) containing one or more of the following native plant species: *Artemisia* sp., *Bidens* sp., *Chamaesyce celastroides, Dodonaea viscosa, Fimbristylis cymosa, Heteropogon contortus, Jaquemontia ovalifolia, Lipochaeta succulenta, Lipochaeta heterophylla, Lipochaeta integrifolia, Lycium sandwicense, Lysimachia mauritiana, Mariscus phloides, Panicum fauriei, P. torridum, Scaevola sericea, Schiedea globosa, Sida fallax,* or *Wikstroemia uva-ursi;* and

(2) elevations below 250 m (800 ft).

The currently known primary constituent elements of critical habitat for *Cyperus trachysanthos* on both Kauai and Niihau are:

(1) wet sites (mud flats, wet clay soil, or wet cliff seeps)

(a) on coastal cliffs or talus slopes, and

(b) containing the native plant species *Hibiscus tiliaceus*; and

(2) elevations between 3 and 160 m (10 and 525 ft).

The currently known primary constituent elements of critical habitat for *Delissea undulata* on Kauai are:

(1) dry or mesic open *Sophora chrysophylla-Metrosideros polymorpha* forests containing one or more of the following native plant species: *Diospyros sandwicensis*, *Dodonaea viscosa*, *Psychotria mariniana*, *P. greenwelliae*, *Santalum ellipticum*, *Nothocestrum breviflorum*, or *Acacia koa*; and

(2) elevations between 610–1,740 m (2,000–5,700 ft).

The currently known primary constituent elements of critical habitat for *Euphorbia haeleeleana* on Kauai are:

(1) lowland mixed mesic or dry forest

(a) that is often dominated by *Metrosideros polymorpha*, *Acacia koa*, or *Diospyros* sp., and

(b) containing one or more of the following native plant species: *Acacia koaia*, *Antidesma platyphyllum*, *Claoxylon* sp., *Carex meyenii*, *Carex wahuensis*, *Diplazium sandwichianum*, *Dodonaea viscosa*, *Erythrina sandwicensis*, *Kokia kauaiensis*, *Pleomele aurea*, *Psychotria mariniana*, *P. greenwelliae*, *Pteralyxia sandwicensis*, *Rauvolfia sandwicensis*, *Reynoldsia sandwicensis*, *Sapindus oahuensis*, *Tetraplasandra Kauaiensis*, *Pouteria sandwicensis*, *Pisonia sandwicensis*, or *Xylosma* sp.; and

(2) elevations between 205 and 670 m (680 and 2,200 ft).

The currently known primary constituent elements of critical habitat for *Flueggea neowawraea* on Kauai are:

(1) dry or mesic forests containing one or more of the following native plant species: *Alectryon macrococcus*, *Bobea timonioides*, *Charpentiera* sp., *Caesalpinia kauaiense, Hibiscus* sp., *Melicope* sp., *Metrosideros polymorpha*, *Myrsine lanaiensis*, *Munroidendron racemosum*, *Tetraplasandra* sp., *Kokia kauaiensis*, *Isodendrion* sp., *Pteralyxia kauaiensis*, *Psychotria mariniana*, *Diplazium sandwichianum*, *Freycinetia arborea*, *Nesoluma polynesicum*, *Diospyros* sp., *Antidesma pulvinatum*, *A. platyphyllum*, *Canthium odoratum*, *Nestegis sandwicensis*, *Rauvolfia sandwicensis*, *Pittosporum* sp., *Tetraplasandra* sp., *Pouteria sandwicensis*, *Xylosma* sp., *Pritchardia* sp., *Bidens* sp., or *Streblus pendulinus*; and

(2) elevations of 250 to 1,000 m (820 to 3,280 ft).

The currently known primary constituent elements of critical habitat for *Gouania meyenii* on Kauai are:

(1) rocky ledges, cliff faces, or ridge tops

(a) in dry shrubland or *Metrosideros polymorpha* lowland mesic forest, and

(b) containing one or more of the following native plant species: *Dodonaea viscosa*, *Chamaesyce* sp., *Psychotria* sp., *Hedyotis* sp., *Melicope* sp., *Nestegis sandwicensis*, *Bidens* sp., *Carex meyenii*, *Diospyros* sp., *Lysimachia* sp., or *Senna gaudichaudii*; and

(2) elevations between 490 to 880 m (1,600 to 2,880 ft).

The currently known primary constituent elements of critical habitat for *Hedyotis cookiana* on Kauai are:

(1) streambeds or steep cliffs close to water sources in lowland wet forest communities; and

(2) elevations between 170 and 370 m (560 and 1,210 ft).

The currently known primary constituent elements for *Isodendrion laurifolium* on Kauai are:

(1) diverse mesic or wet forest

(a) dominated by *Metrosideros polymorpha*, *Acacia koa*, or *Diospyros* sp., and

(b) containing one or more of the following associated native plant species: *Kokia kauaiensis*, *Streblus* sp., *Elaeocarpus bifidus*, *Canthium odoratum*, *Antidesma* sp., *Xylosma*

hawaiiense, *Hedyotis terminalis*, *Pisonia* sp., *Nestegis sandwicensis*, *Dodonaea viscosa*, *Euphorbia haeleeleana*, *Pleomele* sp., *Pittosporum* sp., *Melicope* sp., *Claoxylon sandwicense*, *Alphitonia ponderosa*, *Myrsine lanaiensis*, or *Pouteria sandwicensis*; and

(2) elevations between 490 and 820 m (1,600 and 2,700 ft).

The currently known primary constituent elements of critical habitat for *Isodendrion longifolium* on Kauai are:

(1) steep slopes, gulches, or stream banks

(a) in mesic or wet *Metrosideros polymorpha* forests, and

(b) containing one or more of the following native species: *Dicranopteris linearis*, *Eugenia* sp., *Diospyros* sp., *Pritchardia* sp., *Canthium odoratum*, *Melicope* sp., *Cheirodendron* sp., *Ilex anomala*, *Pipturus* sp., *Hedyotis fluviatilis*, *Peperomia* sp., *Bidens* sp., *Nestegis sandwicensis*, *Cyanea hardyi*, *Syzygium* sp., *Cibotium* sp., *Bobea brevipes*, *Antidesma* sp., *Cyrtandra* sp., *Hedyotis terminalis*, *Peperomia* sp., *Perrottetia sandwicensis*, *Pittosporum* sp., or *Psychotria* sp.; and

(2) elevations between 410 to 760 m (1,345 to 2,500 ft).

The currently known primary constituent elements of critical habitat for *Lobelia niihauensis* on Kauai are:

(1) exposed mesic mixed shrubland or coastal dry cliffs containing one or more of the following associated native plant species: *Eragrostis* sp., *Bidens* sp., *Plectranthus parviflorus*, *Lipochaeta* sp., *Lythrum* sp., *Wilkesia hobdyi*, *Hibiscus kokio* ssp. *saint johnianus*, *Nototrichium* sp., *Schiedea apokremnos*, *Chamaesyce celastroides*, *Charpentiera* sp., or *Artemisia* sp.; and

(2) elevations between 100 to 830 m (330 to 1,400 ft).

The currently known primary constituent elements of critical habitat for *Lysimachia filifolia* on Kauai are:

(1) mossy banks at the base of cliff faces within the spray zone of waterfalls or along streams in lowland wet forests and containing one or more of the following associated native plant species: mosses, ferns, liverworts, *Machaerina* sp., *Heteropogon contortus*, or *Melicope* sp.; and

(2) elevations between 240 to 680 m (800 to 2,230 ft).

The currently known primary constituent elements of critical habitat for *Melicope knudsenii* on Kauai are:

(1) forested flats or talus slopes

(a) in lowland dry or montane mesic forests, and

(b) containing one or more of the following associated native plant species: *Dodonaea viscosa*, *Antidesma* sp., *Metrosideros polymorpha*, *Xylosma* sp., *Hibiscus* sp., *Myrsine lanaiensis*, *Diospyros* sp., *Rauvolfia sandwicensis*, *Bobea* sp., *Nestegis sandwicensis*, *Hedyotis* sp., *Melicope* sp., *Psychotria* sp., or *Pittosporum Kauaiensis*; and

(2) elevations between 450 to 1,000 m (1,480 to 3,300 ft).

The currently known primary constituent element of critical habitat for *Melicope pallida* on Kauai are:

(1) steep rock faces

(a) in lowland or montane mesic or wet forests or shrubland, and

(b) containing one or more of the following associated native plant species: *Dodonaea viscosa*, *Lepidium serra*, *Pleomele* sp., *Boehmeria grandis*, *Coprosma* sp., *Hedyotis terminalis*, *Melicope* sp., *Pouteria sandwicensis*, *Poa mannii*, *Schiedea membranacea*, *Psychotria mariniana*, *Dianella sandwicensis*, *Pritchardia minor*, *Chamaesyce celastroides* var. *hanapepensis*, *Nototrichium* sp., *Carex meyenii*, *Artemisia* sp., *Abutilon sandwicense*, *Alyxia olivaeformis*, *Dryopteris* sp., *Metrosideros polymorpha*, *Pipturus albidus*, *Sapindus oahuensis*, *Tetraplasandra* sp., or *Xylosma hawaiiense*; and

(2) elevations between 490 to 915 m (1,600 to 3,000 ft).

The currently known primary constituent elements of critical habitat for *Peucedanum sandwicense* on Kauai are:

(1) cliff habitats

(a) in mixed shrub coastal dry cliff communities or diverse mesic forest and,

(b) containing one or more of the following associated native plant species: *Hibiscus kokio*, *Brighamia insignis*, *Bidens* sp., *Artemisia* sp., *Lobelia niihauensis*, *Wilkesia gymnoxiphium*, *Canthium odoratum*, *Dodonaea viscosa*, *Psychotria* sp., *Acacia koa*, *Kokio kauaiensis*, *Carex meyenii*, *Panicum lineale*, *Chamaesyce celastroides*, *Eragrostis* sp., *Diospyros* sp., or *Metrosideros polymorpha*; and

(2) elevations from sea level to above 915 m (3,000 ft).

The currently known primary constituent elements of critical habitat for *Plantago princeps* on Kauai are:

(1) steep slopes, rock walls, or bases of waterfalls

(a) in mesic or wet *Metrosideros polymorpha* forest, and (b) containing one or more of the following associated native plant species: *Dodonaea viscosa*, *Psychotria* sp., *Dicranopteris linearis*, *Cyanea* sp., *Hedyotis* sp., *Melicope* sp., *Dubautia plantaginea*, *Exocarpos luteolus*, *Poa siphonoglossa*, *Nothocestrum peltatum*, *Remya montgomeryi*, *Stenogyne campanulata*, *Xylosma* sp., *Pleomele* sp., *Machaerina angustifolia*, *Athyrium* sp., *Bidens* sp., *Eragrostis* sp., *Lysimachia filifolia*, *Pipturus* sp., *Cyrtandra* sp., or *Myrsine linearifolia*; and

(2) elevations between 480 to 1,100 m (1,580 to 3,610 ft).

The currently known primary constituent elements of critical habitat for *Platanthera holochila* on Kauai are:

(1) *Metrosideros polymorpha-Dicranopteris linearis* montane wet forest or *M. polymorpha* mixed bog and containing one or more of the following associated native plants: *Myrsine denticulata*, *Cibotium* sp., *Coprosma ernodeoides*, *Oreobolus furcatus*, *Styphelia tameiameiae*, or *Vaccinium* sp.; and

(2) elevations between 1,050 and 1,600 m (3,450 and 5,245 ft).

The currently known primary constituent elements of critical habitat for *Schiedea nuttallii* on Kauai are:

(1) diverse lowland mesic forest, often with *Metrosideros polymorpha* dominant and containing one or more of the following associated native plant species: *Antidesma* sp. *Psychotria* sp., *Perrottetia sandwicensis*, *Pisonia* sp., or *Hedyotis acuminata*; and

(2) elevations between 415 and 790 m (1,360 and 2,590 ft).

The currently known primary constituent elements of critical habitat for *Sesbania tomentosa* on Kauai are:

(1) sandy beaches, dunes, soil pockets on lava, or pond margins

(a) in coastal dry shrublands, or open *Metrosideros polymorpha* forests, or mixed coastal dry cliffs, and

(b) containing one or more of the following associated native plant species: *Sida fallax*, *Heteropogon contortus*, *Myoporum sandwicense*, *Sporobolus virginicus*, *Scaevola sericea* or *Dodonaea viscosa*; and

(2) elevations between sea level and 12 m (0 and 40 ft).

The currently known primary constituent elements of critical habitat for *Solanum sandwicense* on Kauai are:

(1) open, sunny areas

(a) in diverse lowland or montane mesic or wet forests, and

(b) containing one or more of the following associated plants: *Alphitonia ponderosa*, *Ilex anomala*, *Xylosma* sp., *Athyrium sandwicensis*, *Syzygium sandwicensis*, *Bidens cosmoides*, *Dianella sandwicensis*, *Poa siphonoglossa*, *Carex meyenii*, *Hedyotis* sp., *Coprosma* sp., *Dubautia* sp., *Pouteria sandwicensis*, *Cryptocarya mannii*, *Acacia koa*, *Metrosideros polymorpha*, *Dicranopteris linearis*, *Psychotria* sp., or *Melicope* sp.; and

(2) elevations between 760 and 1,220 m (2,500 and 4,000 ft).

The currently known primary constituent elements of critical habitat for *Spermolepis hawaiiensis* on Kauai are:

(1) *Metrosideros polymorpha* forests or *Dodonaea viscosa* lowland dry shrubland containing one or more of the following associated plant species: *Eragrostis variabilis*, *Bidens sandvicensis*, *Schiedea spergulina*, *Lipochaeta* sp., *Cenchrus agrimonioides*, *Sida fallax*, *Doryopteris* sp., or *Gouania hillebrandii*; and

(2) elevations of about 305 to 600 m (1,000 to 2,000 ft).

The currently known primary constituent elements of critical habitat for *Zanthoxylum hawaiiense* on Kauai are:

(1) lowland dry or mesic forests, or montane dry forest

(a) dominated by *Metrosideros polymorpha* or *Diospyros sandwicensis*, and

(b) containing one or more of the following associated plant species: *Pleomele auwahiensis*, *Antidesma platyphyllum*, *Pisonia* sp., *Alectryon macrococcus*, *Charpentiera* sp., *Melicope* sp., *Streblus pendulinus*, *Myrsine lanaiensis*, *Sophora chrysophylla*, or *Dodonaea viscosa*; and

(2) elevations between 550 and 730 m (1,800 and 2,400 ft).

C. Methods for Selection of Areas for Proposed Critical Habitat Designations

As discussed above, very little is known about the specific physical and biological requirements of most of the 76 species. Therefore, we have defined the primary constituent elements based on the general habitat features of the areas in which the plants currently occur, such as the type of plant community the plants are growing in, their physical location (*e.g.*, steep rocky cliffs, talus slopes, stream banks), and elevation. The areas we are proposing to designate as critical habitat provide some or all of the habitat components essential for the conservation of the 76 plant species.

Critical habitat may also include areas outside the area currently occupied by a species when it is determined that such areas are essential to the conservation of the species. 16 U.S.C. § 1532(5)(A)(ii). For example, this may include potentially suitable unoccupied habitat that is important to the recovery of the species. However, except for areas within the Alakai Swamp, as discussed later, we have not included such areas in the proposed designations for these 76 species due to our limited knowledge of the historical range (the geographical area outside the area presently occupied by the species) and our lack of more detailed information on the specific physical or biological features essential for the conservation of the species. This would include those features that would be needed, for instance, to determine where to reintroduce a species. Although, we consider reintroduction (the planting of propagated individuals or seedlings into an area) to be an acceptable method to try to achieve plant species recovery, native plant reintroductions are difficult and successful efforts are not common. We will continue to support experimental efforts to reintroduce species that may provide us with additional information on the physical and biological features essential to the conservation of these species. If necessary, unoccupied habitat could be designated in the future to provide additional protection to reintroduced plants.

The historical (pre-1970) or even some post-1970 records for a species may be based on herbarium specimens that contain only the most rudimentary collection information, such as only the name of the island from which the specimen was collected or a general place name (*e.g.*, east Kauai, Na Pali coast, Waimea, Hanalie). In the main Hawaiian Islands, climatic and ecological conditions, such as rainfall, elevation, slope, and aspect, may vary dramatically within a relatively short distance. Therefore, a simple place name would not provide adequate information on the specific physical and biological features of the area where the plant specimen was collected.

The apparent unpredictable distribution of Hawaiian plant species also makes it difficult to designate potentially suitable unoccupied habitat. For example, a species may be known from northern and southern locations on an island, but not from intervening locations in similar habitat. Based on the best available information, we may be unable to determine whether the species once occurred in the intervening areas and disappeared prior to Polynesian or European times (thus never having been collected or documented there) or simply never occurred there.

As required by the Act and regulations (section 4(b)(2) and 50 CFR 424.12) we used the best scientific information available to determine areas that contain the physical and biological features that are essential for the survival and recovery of the 76 plant species. This information included site-specific species information from the Hawaii Natural Heritage Program (HINHP) and our rare plant database, species information from the Center for Plant Conservation's (CPC) rare plant monitoring database housed at the University of Hawaii's Lyon Arboretum, recent biological surveys and reports, our recovery plans for these 76 species, discussions with botanical experts, and recommendations from the Hawaii and Pacific Plant Recovery Coordinating Committee (Plant Recovery Committee) (see below) (HINHP 1999, Plant Recovery Committee 1998, USFWS 1994, 1995, 1996, 1998a, 1998b, 1999; S. Perlman, pers. comm. 2000; Derral Herbst, Bishop Museum, pers. comm., 2000; Warren L. Wagner, Smithsonian Institution, pers. comm., 2000; CPC *in litt.*1999).

In 1994, the Plant Recovery Committee initiated an effort to identify and map habitat it believed to be necessary for the recovery of 282 endangered and threatened Hawaiian plant species. The Plant Recovery Committee identified areas on most of the islands in the Hawaiian chain, and in 1999, we published a description of these areas in our *Recovery Plan for the Multi-Island Plants* (USFWS 1999). The Plant Recovery Committee expects there will be subsequent efforts to further refine the locations of important habitat areas and that new survey information or research findings may also lead to additional refinements (Plant Recovery Committee 1998).

Because the Plant Recovery Committee identified essential habitat areas for all listed, proposed, and candidate plant species, as well as evaluated if these essential habitat areas would provide for habitat requirements of other species the Service is monitoring, the Plant Recovery Committee's mapping of habitat is distinct from the regulatory designation of critical habitat. These habitat maps are a planning tool to focus conservation efforts on the areas that may be most important to the conservation of Hawaii's listed species and other non-listed plants.

For the 76 plant species on Kauai and Niihau, currently occupied habitat was examined and critical habitat boundaries were delineated so that locations with a high density of endangered and threatened plants (multi-species units) were clearly depicted. However, these multi-species critical habitat units are not homogeneous or uniform in nature. The variable topography of the Hawaiian Islands necessitate the creation of critical habitat units that often encompassed a number of plant community types.

When developing critical habitat units, every current (post-1970) location of every plant specimen was delineated within a 586 m (1,924 ft) radius circle,

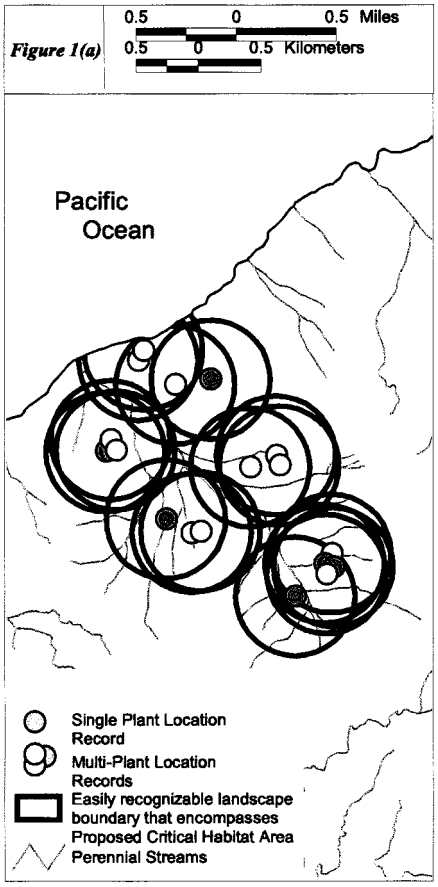
in order to insure enough area to provide for the proper ecological functioning of the habitat immediately supporting the plant. Due to inaccuracies in mapping locations, it has been determined that the actual location of the plant specimen is within 536 m (1,760 ft) of the center of the delineated circle. The 536 m (1,760 ft) distance is consistent with standard mapping methodology for rare species used by the HINHP (1996). An additional 50 m (164 ft) included in the delineated circle to be consistent with the guidelines identified in the recovery plans for these species for minimum-sized exclosures for rare plants (USFWS 1994, 1995, 1996, 1998a, 1998b, 1999). In cases of isolated species locations, an area with a radius of roughly 586 m (1,924 ft) is proposed as critical habitat (HINHP 1996; USFWS 1994, 1995, 1996, 1998a, 1998b, 1999).

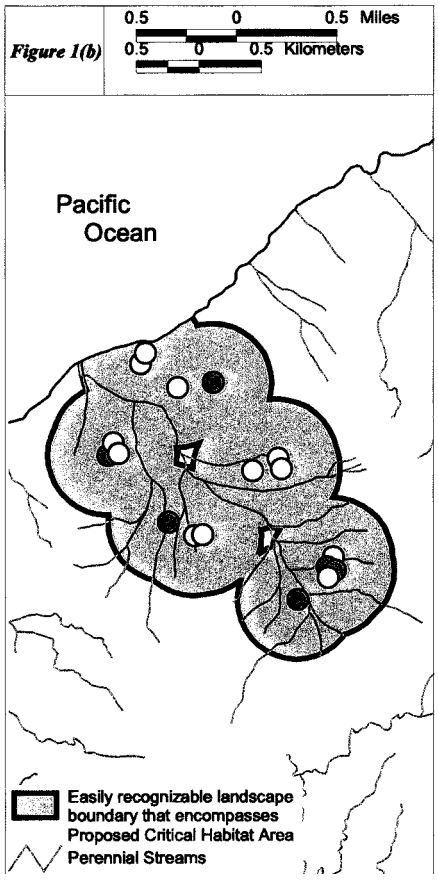
In areas with multiple species locations, critical habitat units were developed as follows.

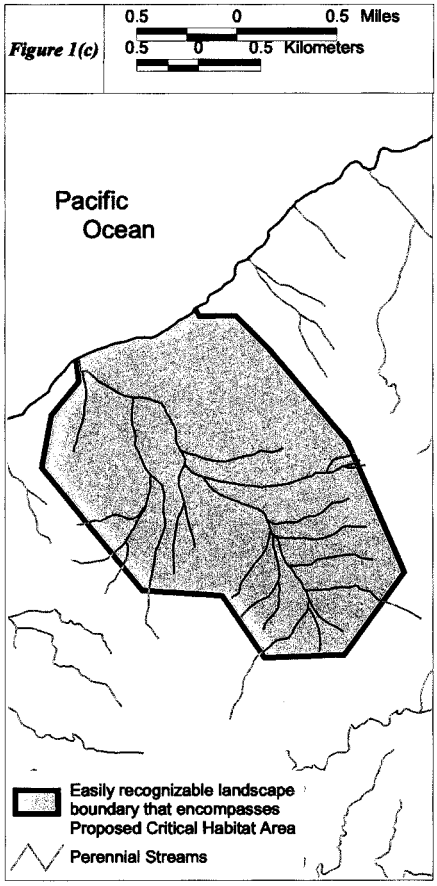
—Known current locations of each plant specimen were delineated using the guidelines explained above (Figure 1(a)).

—The perimeter boundaries of individual circular areas were connected to form unit area boundaries (Figure 1(b)).

—Unit area boundaries were delineated to follow significant topographic features (50 CFR § 424.12(c)) such as coastlines, ridgelines, and valleys (Figure 1(c)).







This delineation method was used to facilitate identification of boundary lines and to aid in implementation of on-the-ground conservation measures. When delineating critical habitat units, we made an effort to avoid developed areas such as towns, agricultural lands, and other lands unlikely to contribute to the conservation of the 76 species. Existing features and structures within proposed areas, such as buildings, roads, aqueducts, telecommunications equipment, arboreta and gardens, heiaus (indigenous place of worship, shrine), and other man-made features, do not contain, and are not likely to develop, constituent elements. Therefore, unless a Federal action related to these existing features or structures indirectly affected nearby habitat containing the primary constituent elements, such features or structures would not be included in the critical habitat designation and therefore, not be impacted by the designation of critical habitat.

The only exception to this methodology are the units in the Alakai Swamp area (units H, I, and T). The Alakai Swamp is a contiguous watershed that, due to its largely boggy condition, is sensitive to disturbances. The relatively level cap rock formation of the Alakai plateau has allowed clay-like soils to accumulate in this area and produce bogs and large forested areas

with hydrated (wet) soil. Where water has completely saturated the soils, many of the common native plants, such as *Metrosideros polymorpha*, *Vaccinium* sp., *Styphelia tameiameiae*, and *Coprosma* sp., are severely stunted and give way to species adapted specifically to bog environments (Carlquist 1980). Patterns of water drainage in the Alakai are critical to the maintenance of plant habitats and plant community diversity in this ecosystem (Mueller-Dombois and Fosberg 1998). Changes in water flow patterns or forest cover can lead to long-term shifts in plant habitat used by *Exocarpos luteolus* and *Platanthera holochila*, the two federally listed plant species known from this area. *Platanthera holochila* is restricted to the bog habitats within the Alakai Swamp where fewer than ten individuals exist. *Exocarpos luteolus* is typically associated with habitat edges where ecological conditions such as availability of light and moisture changes rapidly over short distances. These types of habitats cover comparatively small areas that are scattered throughout the Alakai Swamp landscape. In addition, individual areas may disappear or be created over time depending on changes in seasonal patterns of rainfall or water drainage, or rooting pigs which can alter these edge landscapes and open them to invasive nonnative weeds, such as *Juncus* sp. that can exclude native plants.

Because the habitats required by these two listed species are likely dispersed throughout the Alakai Swamp, we believe this area should be managed as a cohesive ecological unit in order to insure enough area to provide for the proper ecological functioning of the habitat immediately supporting the plants. Smaller areas where these species now occur may simply dry up or become too wet to sustain them. In addition, the current known locations of these two listed species may not represent all extant locations. The Alakai Swamp area is extremely rugged and difficult to survey, and remnant populations may occur in remote areas of the Swamp. Therefore, it is possible that the entire swamp is occupied habitat, but to the extent portions are not currently occupied, maintenance of the swamp's ecosystem is essential to the conservation of these species. Designation of an inclusive areas is also consistent with 50 CFR 424.12(d) which allows for several habitats that each meet the requirements for designation to be designated at one unit.

All currently occupied sites containing one or more of the primary constituent elements considered essential to the conservation of the 76 plant species were examined to determine if additional special management considerations or protection are required above those currently provided. We reviewed all available management information on the plants at these sites including published reports and surveys; annual performance reports; forestry management plans; grants; memoranda of understanding and cooperative agreements; DOFAW planning documents; internal letters and memos; biological assessments and environmental impact statements; and, section 7 consultations. Additionally, each public (*i.e.*, any county, state, or Federal government office holdings) and private landowner on Kauai and Niihau with a known occurrence of one of the 76 species was contacted by mail. We reviewed all information received during the public comment period, in response to our landowner mailing and at open houses held at three locations on Kauai from October 19–21, 1999. When clarification was required on the information provided to us, we followed up with a telephone contact. Because of the large amount of land on Kauai under State of Hawaii jurisdiction, we personally met with staff from the Kauai DOFAW and Kauai State Parks to discuss their current management for the plants on their lands. In addition, we contacted the State's Department of Hawaiian Home Lands regarding management for the plants on lands under their jurisdiction.

If an area being considered for designation as critical habitat is not in need of additional special management or protection and it is certain to remain so in the future, the area does not meet the definition in section 3(5)(A) of the Act. In order to make the determination that an area is not in need of special management considerations or protection, we must find that the management efforts are certain to be implemented and effective so as to contribute to the recovery of the species. Any such area must be specifically managed for the species and have a net conservation benefit for the species. In this case, we considered whether the management would reduce the threats to the species.

In determining and weighing the relative significance of the threats that would need to be addressed in management plans or agreements, we considered the following:

—The factors that led to the listing of the species, as described in the final rules for listing each of the species. For all or nearly all endangered and threatened plants in Hawaii, the major threats include adverse impacts due to nonnative plant and animal species. Direct browsing, digging, and trampling by ungulates, including pigs, goats, cattle, sheep, and deer, and direct competition from nonnative plants have led to the decline of Hawaii's native flora (Smith 1985; Stone 1985; Wagner *et al.* 1985; Scott *et al.* 1986; Cuddihy and Stone 1990; Vitousek 1992; Loope in Mac *et al.* 1998; USFWS 1994, 1995, 1996, 1998a, 1998b, 1999). Ungulate activity in most areas results in an increase of nonnative plants since most of these nonnative plants are able to colonize disturbed areas more quickly and effectively than Hawaii's native plants (Smith 1985; Scott *et al.* 1986; Cuddihy and Stone 1990; Mack 1992; Tunison *et al.* 1992; USFWS 1994, 1995, 1996, 1998a, 1998b, 1999).

—The management actions needed for assurance of survival and ultimate recovery of Hawaii's endangered plants. These actions are described in the Service's recovery plans for the 76 species (USFWS 1994, 1995, 1996, 1998a, 1998b, 1999), the 1998 Plant Recovery Committee report (''Habitat Essential to the Recovery of Hawaiian Plants'') to the Service (Plant Recovery Committee 1998), the June 1999 Plant Recovery Committee draft ''Integrated Plan for the Conservation of Hawaii's Unique Plants and the Ecosystems They Depend Upon'' (Plant Recovery Committee in prep.), and in various other documents and publications relating to plant conservation in Hawaii (Mueller-Dombois 1985; Smith 1985; Stone 1985; Cuddihy and Stone 1990; Stone *et al.* 1992). In addition to monitoring the plant populations, these actions include, but are not limited to: (1) Feral ungulate control; (2) nonnative plant control; (3) rodent control; (4) invertebrate pest control; (5) fire control; (6) maintenance of genetic material of the endangered and threatened plants species; (7) propagation, reintroduction, and/or augmentation of existing populations into areas deemed essential for the recovery of these species; (8) ongoing management of the wild, outplanted, and augmented populations; and (9) habitat management and restoration in areas deemed essential for the recovery of these species.

In general, taking all of the above recommended management actions into account, the following management actions are ranked in order of importance. It should be noted, however, that, on a case-by-case basis,

some of these actions may rise to a higher level of importance for a particular species or area, depending on the biological and physical requirements of the species and the location(s) of the individual plants:

—Feral ungulate control;
—Nonnative plant control;
—Rodent control;
—Invertebrate pest control;
—Fire control;
—Maintenance of genetic material of the endangered and threatened plant species;
—Propagation, reintroduction, and/or augmentation of existing populations into areas deemed essential for the recovery of the species;
—Ongoing management of the wild, outplanted, and augmented populations;
—Maintenance of natural pollinators and pollinating systems, when known;
—Habitat management and restoration in areas deemed essential for the recovery of the species;
—Monitoring of the wild, outplanted, and augmented populations;
—Rare plant surveys;
—Control of human activities/access.

As shown in Table 3, the 76 species of plants occur on Federal, State, and private lands on the islands of Kauai and Niihau. In addition to the information in our files, we received various amounts and types of information on the conservation management actions occurring on these lands. In response to our two public notices, letters to the landowners, open houses, and meetings, many landowners reported that they are not conducting conservation management actions on their lands, while others provided information on various activities, such as fencing, weeding, and control of human access.

Management occurring on the U.S. military lands on the island of Kauai currently consists of restricting human access and mowing landscaped areas. Since these actions alone are not sufficient to address relevant threats facing the listed plant species, these lands are included in the proposed critical habitat units for the following plant species: *Panicum niihauense, Sesbania tomentosa, Pteralyxia kauaiensis, Wilkesia hobdyi, Isodendrion longifolium, Nothocestrum peltatum, Phyllostegia wawrana, Remya montgomeryi, Schiedea membranacea, Solanum sandwicense,* and *Xylosma crenatum.*

The State lands on the island of Kauai that harbor many of the 76 plant species are administered by the Department of Hawaiian Home Lands (DHHL) and the Department of Land and Natural Resources (DLNR). DLNR lands are made up of State Parks, Forest Reserves, Natural Area Reserves, and the Alakai Wilderness Preserve. The Division of Forestry and Wildlife administers all of these lands, except the State parks, which are administered by the Division of State Parks. DLNR also manages the DHHL lands on the island of Kauai. Although the State conducts some conservation management actions on these lands and provides access to others who are conducting such activities, there are no comprehensive management plans for the long-term conservation of endangered and threatened plants on these lands and no assurances that management actions will be implemented. Therefore, we cannot, at this time, find that management on State lands is adequate to exclude them from designation as critical habitat.

The Service received 25 responses from the over 160 private landowners who received letters inquiring about management actions on their lands. The main activities being conducted by several of these landowners are weeding, control of human access, and planting of native species. We are aware of only a few private landowners who are drafting management plans for their areas. Without such plans and assurances that the plans will be implemented, we are unable to find that the lands in question do not require special management or protection.

For the 76 species for which designation of critical habitat is prudent, we know of no areas at this time that do not require special management considerations or protection. However, if we receive information during the public comment period that any of the lands within the proposed designations are actively managed to promote the conservation and recovery of these listed species, in accordance with long term conservation management plans or agreements, and there are assurances that the proposed management actions will be implemented and effective, we can consider this information when making a final determination of critical habitat.

In summary, the proposed critical habitat areas described below constitute our best assessment of the physical and biological features needed for the conservation of the 76 plant species and the special management needs of the species, and are based on the best scientific and commercial information available and described above. We acknowledge that we have incomplete information regarding many of the primary biological and physical requirements for these species, but the Act and relevant court orders require us to proceed with designation at this time based on the available information, however limited. As new information accrues, and in conjunction with our listing priority guidance and available budget, we may reevaluate if additional areas warrant critical habitat designation. We anticipate that comments received through the public review process and from any public hearings, if requested, will provide additional information in our decision-making process.

The approximate areas of proposed critical habitat by land ownership are shown in Table 5. Proposed critical habitat includes habitat for 76 species predominantly in northwestern Kauai, with smaller units scattered in other portions of the island and two small units in the northwestern portion of Niihau. Lands proposed are under private, State, and Federal jurisdiction (owned and leased lands), with Federal lands including lands managed by the Department of Defense. Lands proposed as critical habitat have been divided into 21 units (Kauai A through Kauai U) on Kauai and 2 units (Niihau A and Niihau B) on Niihau. A brief description of each unit is presented below.

TABLE 5.—APPROXIMATE PROPOSED CRITICAL HABITAT AREA BY UNIT AND LAND OWNERSHIP OR JURISDICTION, KAUAI COUNTY, HAWAII

Unit name	State	Private	Federal	Total
Kauai A	N/A	120.79 hectares (298.34 acres)	N/A	120.79 hectares (298.34 acres).
Kauai B	139.32hectares (344.27 acres)	2.91 hectares (7.18 acres)	N/A	142.23 hectares (351.45 acres).
Kauai C	N/A	123.92 hectares (306.20 acres)	N/A	123.92 hectares (306.20 acres).

TABLE 5.—APPROXIMATE PROPOSED CRITICAL HABITAT AREA BY UNIT AND LAND OWNERSHIP OR JURISDICTION, KAUAI COUNTY, HAWAII—Continued

Unit name	State	Private	Federal	Total
Kauai D	N/A	124.68 hectares (308.08 acres)	N/A	124.68 hectares (308.08 acres).
Kauai E	N/A	116.72 hectares (288.42 acres)	N/A	116.72 hectares (288.42 acres).
Kauai F	352.05hectares (869.91 acres)	591.05 hectares (1,460.49 acres)	N/A	943.10 hectares (2,330.40 acres).
Kauai G	6,052.12 hectares (14,954.79 acres)	316.27 hectares (781.50 acres)	3.67 hectaries (9.06 acres)	6,372.06 hectares (15,745.35 acres).
Kauai H	3,877.20 hectares (9,580.55 acres)	68.49 hectares (169.25 acres)	N/A	3,945.69 hectares (9,749.80 acres).
Kauai I	4,042.80 hectares (9,989.77 acres)	1,067.95 hectares (2,638.91 acres)	N/A	5,110.75 hectares (12,628.67 acres).
Kauai J	328.79 hectares (812.43 acres)	102.48 hectares (253.22 acres)	72.78 hectares (179.83 acres)	504.05 hectares (1,245.48 acres).
Kauai K	N/A	820.76 hectares (2,028.09 acres)	N/A	820.76 hectares (2,028.09 acres).
Kauai L	215.40 hectares (532.24 acres)	1,466.89 hectares (3,624.69 acres)	N/A	1,682.29 hectares (4,156.93 acres).
Kauai M	N/A	482.16 hectares (1,191.42 acres)	N/A	482.16 hectares (1,191.42 acres).
Kauai N	286.14 hectares (707.06 acres)	N/A	N/A	286.14 hectares (707.06 acres).
Kauai O	188.93 hectares (466.85 acres)	53.86 hectares (133.08 acres)	N/A	242.79 hectares (599.93 acres).
Kauai P	456.62 hectares (1,128.30 acres)	254.82 hectares (639.66 acres)	N/A	711.44 hectares (1,757.96 acres).
Kauai Q	58.35 hectares (144.18 acres)	195.35 hectares (482.71 acres)	N/A	253.70 hectares (626.89 acres).
Kauai R	694.10 hectares (1,715.13 acres)	521.49 hectares (1,288.60 acres)	N/A	1,215.59 hectares (3,003.73 acres).
Kauai S	119.08 hectares (294.26 acres)	N/A	N/A	119.08 hectares (294.26 acres).
Kauai T	200.57 hectares (495.63 acres)	438.01 hectares (a,082.32 acres)	N/A	638.58 hectares (1,577.95 acres).
Kauai U	392.21 hectares (969.15 acres)	N/A	N/A	392.21 hectares (969.15 acres).
Niihau A	N/A	93.79 hectares (231.76 acres)	N/A	93.79 hectares (231.76 acres).
Niihau B	N/A	96.76 hectares (239.09 acres)	N/A	96.76 hectares (239.09 acres).
Total	17,403.68 hectares (43,004.52 acres)	7059.10 hectares (17,443.01 acres)	76.45 hectares (188.89 acres)	24.539.23 hectares (60,636.42 acres).

Descriptions of Critical Habitat Units

Kauai A

The proposed Kauai A provides critical habitat for one species: *Cyrtandra limahuliensis.* This unit contains a total of 120.79 hectares (ha) (298.34 acres (ac)) on privately owned land. The natural features found in this unit are portions of the floor and western wall of Lumahai Valley and portions of the Lumahai River. This unit is bound on the west by the western wall of Lumahai Valley and on the east by the eastern wall of Lumahai Valley.

Kauai B

The proposed Kauai B provides critical habitat for two species: *Lipochaeta waimeaensis* and *Spermolepis hawaiiensis.* This unit contains a total of 142.23 ha (351.45 ac). The lands contained within this unit are owned by the State of Hawaii and by private landowners. The natural features found within this unit are portions of the following areas: western wall of Waimea Canyon, Huluhulunui Ridge, Hukipo Ridge, and the Waimea River. This unit is bounded on the northeast and east by Waimea Canyon; on the west by Kapilimao Valley; and on the south by Hukipo Ridge.

Kauai C

The proposed Kauai C provides critical habitat for one species: *Schiedea spergulina* var. *leiopoda.* This unit contains a total of 123.92 ha (306.20 ac) of privately owned land. The natural features found within this unit are portions of the Lawai Valley and Lawai Stream. To the east of the unit is the Niukapu Heiau; to the south is Lawai Bay; to the north are the Lawai Homesteads; and to the northwest is Kalaheo town.

Kauai D

The proposed Kauai D provides critical habitat for one species: *Solanum sandwicense.* This unit totals 124.68 ha (308.08 ac) on land owned by a single private entity within the State's Na Pali-Kona Forest Reserve. The most evident natural feature found in this area is a portion of the Mokuone Stream.

Kauai E

The proposed Kauai E provides critical habitat for *Brighamia insignis.* This unit contains a total of 116.72 ha (288.42 ac), all within the Haupu Mountain Range. The area contained in this unit is owned by a private entity. The natural features found in this unit are Keopaweo Peak and portions of the north facing slope of the Haupu

Mountain Range. This area is bounded on the north by Huleia Stream.

Kauai F

The proposed Kauai F provides critical habitat for 12 species: *Adenophorus periens, Cyrtandra limahuliensis, Delissea rhytidosperma, Flueggea neowawraea, Hesperomannia lydgatei, Hibiscus waimeae* ssp. *hannerae, Isodendrion longifolium, Labordia lydgatei, Lobelia niihauensis, Myrsine linearifolia, Peucedanum sandwicense,*and *Pteralyxia kauaiensis.* This unit contains a total of 943.10 ha (2,330.40 ac) of land owned by the State of Hawaii and private owners. A very small portion of this unit is found in the State's Hono o Na Pali Natural Area Reserve. The natural features contained within this unit are Kulanaililia Peak, portions of Manoa Stream, Pohakukane Peak, portions of Haena Valley, portions of the Wainiha Pali, portions of Wainiha Valley, Hono o Na Pali Peak, Limahuli Falls, Limahuli Valley and Stream, Maunapulua Peak, Maunahou Peak, Makana Peak, and portions of Hanakapiai Valley and Stream. This unit is bounded on the east by Wainiha Pali and Valley; on the west by Hanakapiai Valley; on the southwest by the Kauai G; and on the north by Haena State Park, the Pacific Ocean, and Haena town.

Kauai G

The proposed Kauai G provides critical habitat for 48 species: *Adenophorus periens, Alectryon macrococcus, Alsinidendron lychnoides, Bonamia menziesii, Brighamia insignis, Centaurium sebaeoides, Chamaesyce halemanui, Cyperus trachysanthos, Delissea rhytidosperma, Delissea rivularis, Delissea undulata, Diellia pallida, Dubautia latifolia, Euphorbia haeleeleana, Exocarpos luteolus, Flueggea neowawraea, Gouania meyenii, Hedyotis cookiana, Hedyotis st.-johnii, Hibiscadelphus woodii, Isodendrion laurifolium, Isodendrion longifolium, Kokia kauaiensis, Lipochaeta fauriei, Lobelia niihauensis, Melicope haupuensis, Melicope knudsenii, Melicope pallida, Munroidendron racemosum, Myrsine linearifolia, Nothocestrum peltatum, Peucedanum sandwicense, Phyllostegia wawrana, Plantago princeps, Poa mannii, Poa sandvicensis, Poa siphonoglossa, Pteralyxia kauaiensis, Remya kauaiensis, Remya montgomeryi, Schiedea apokremnos, Schiedea kauaiensis, Schiedea membranacea, Schiedea spergulina* var. *spergulina, Solanum sandwicense, Stenogyne campanulata, Wilkesia hobdyi,* and *Xylosma crenatum.* This unit contains a total of 6,372.06 ha (15,745.35 ac). The lands contained within this unit are owned by the State of Hawaii, private land owners, and owned or leased by the United States Department of Defense (U.S. Navy and U.S. Air Force). Portions of this unit are contained within the State's Hono o Na Pali Natural Area Reserve, Kuia Natural Area Reserve, Na Pali-Kona Forest Reserve, Kokee Air Force Station, Kokee State Park, and Puu Ka Pele Forest Reserve. The natural features found in this unit are portions of Kopakaka Ridge; portions of Makaha Ridge and Valley; Milolii Ridge; portions of Kauhao Valley; Paaiki Valley; Poopooiki Valley; Kuia Valley; Mahanaloa Valley; Kawaiula Valley; Milolii Valley; portions of Kaahole Valley; Nualoolo Valley and Stream; Awaawapuhi Valley; Honopu Valley; Makaha Point; Keawanui Point; Makuaiki Point; Alapii Point; Puanaiea Point; Nakeikionaiwi Falls; Kalepa Ridge; Kainamanu Peak; Kalahu; Nianiau; Kalalau Beach, Valley, and Stream; Kanakou; Puu Ki; Kaaalahina Ridge; Keanapuka; Alealau; Manono Ridge; Hanakoa Valley and Stream; Pohakukumano; Waiahuakua; Waiahuakua Stream; Pohakea; Hoolulu Stream; Puu okila; Pihea; Moaalelele; portions of Hanakapiai Stream and Valley; Kaunouhua Ridge; and Kahuamaa Flat. This area is bounded on the north and northeast by the Pacific Ocean; on the northeast by Kauai F; on the southeast by Kauai H; and on the south by Kauai I.

Kauai H

The proposed Kauai H provides critical habitat for four species: *Alsinidendron lychnoides, Exocarpos luteolus, Myrsine linearifolia,* and *Platanthera holochila.* This unit contains a total of 3,945.69 ha (9,749.80 ac) on State and private lands. Portions of this area are contained within the State's Na Pali-Kona Forest Reserve, Alakai Wilderness Preserve, Halelea Forest Reserve, and Kokee State Park. The natural features found in this unit are portions of the Kawaikoi Stream; most of the Alakai Swamp; portions of Kaunuohua Ridge; Pihea Peak; Waiakoali Stream; Koali Peak; portions of Kawaiiki Ridge; portions of Kawaiiki Valley; portions of Koaie Stream; portions of Waialae Stream; portions of Loli River; portions of Halepaakai Stream; and portions of Halehaha Stream. This unit is bounded on the northeast by Kauai K; on the west by Kauai I; and on the south by Opaewela Valley.

Kauai I

The proposed Kauai I provides critical habitat for 36 species: *Alectryon macrococcus, Alsinidendron viscosum, Chamaesyce halemanui, Diellia pallida, Dubautia latifolia, Euphorbia haeleeleana, Exocarpos luteolus, Flueggea neowawraea, Gouania meyenii, Isodendrion laurifolium, Kokia kauaiensis, Lipochaeta fauriei, Lipochaeta micrantha, Lobelia niihauensis, Melicope haupuensis, Melicope knudsenii, Melicope pallida, Munroidendron racemosum, Myrsine linearifolia, Nothocestrum peltatum, Peucedanum sandwicense, Phyllostegia knudsenii, Phyllostegia wawrana, Poa sandvicensis, Poa siphonoglossa, Pteralyxia kauaiensis, Remya kauaiensis, Remya montgomeryi, Schiedea helleri, Schiedea membranacea, Schiedea spergulina var. spergulina, Schiedea stellarioides, Solanum sandwicense, Spermolepis hawaiiensis, Xylosma crenatum,* and *Zanthoxylum hawaiiense.* This unit contains a total of 5,110.75 ha (12,628.68 ac). The unit contains areas owned by the State of Hawaii and private owners. Portions of this unit are found within the State's Puu Ka Pele Forest Reserve, Na Pali-Kona Forest Reserve, Kokee State Park, Waimea Canyon State Park, and Alakai Wilderness Preserve. The natural areas found in this unit are upper portions of Awini Stream, portions of Kokee Stream, portions of Waipoo falls, Kaou, portions of Loli River, portions of Waiahulu Stream, portions of Poomau Stream, portions of Kohua Ridge, portions of Kaluahaula Ridge, portions of Koaie Stream and Canyon, portions of Hipalau Valley, Poo Kaena Peak, portions of Oneopaewa Valley, portions of Waimea Canyon, portions of Waimea River, portions of Nawaimaka Valley and Stream, Waialae Falls, portions of Kapukapala Ridge, Kipalau Valley, a small portion of the Alalaki Swamp, Waineke Swamp, Kumuwela Ridge, portions of Maluapopoki Stream, portions of Koliee Stream, portions of Elekeninui Stream, portions of Noe Stream, portions of Elekeniiki Stream, Puu Kaohelo Peak, portions of Kauaikinuna Stream, portions of Mohihi Stream, Haeleele Ridge, portions of Haeleele Valley, portions of Kaulaula Valley, Kawaiiki Ridge, Kumuwela Ridge, portions of Wahana Valley, Kaluahaulau Ridge, and portions of Kawaiiki Valley. Kauai H is bordered by Kauai I to the east and northeast. The Na Pali coastline is to the north, northwest, and west of the boundaries. The remainder of the Alakai Swamp is to the east and northeast.

Kauai J

The proposed Kauai J provides critical habitat for six species: *Hedyotis st.-johnii, Lobelia niihauensis, Panicum niihauense, Schiedea apokremnos, Sesbania tomentosa,* and *Wilkesia hobdyi.* This unit contains a total of 504.05 ha (1,245.48 ac) on Federal, State, and privately owned land. Portions of this unit are contained within the State's Puu Ka Pele Forest Reserve, Polihale State Park, and the Pacific Missile Range Facility. The natural features and landmarks found in this area are Polihale Spring, Kapaula Heiau, and the lower portions of Haeleele Valley, Hikimoe Valley, Kaaweiki Ridge, Kauhao Ridge, Kaaweiki Ridge, and Polihale Ridge. This area is bounded on the east by the Pacific Ocean.

Kauai K

The proposed Kauai K provides critical habitat for 7 species: *Adenophorus periens, Cyanea recta, Cyrtandra cyaneoides, Cyrtandra limahuliensis, Labordia lydgatei, Plantago princeps,* and *Schiedea membranacea.* This unit contains a total of 820.76 ha (2,028.09 ac). The areas contained in this unit are owned by the State of Hawaii. Portions of this unit are found within the State's Halelea Forest Reserve. The natural features found in this area are the back portions of Lumahai Valley and River, Mahinakehau Ridge, the back portions of Wainiha Valley and River, and sections of the Wainiha Pali.

Kauai L

The proposed Kauai L provides critical habitat for 14 species: *Adenophorus periens, Bonamia menziesii, Cyanea remyi, Cyanea undulata, Cyrtandra limahuliensis, Dubautia pauciflorula, Exocarpos luteolus, Hesperomannia lydgatei, Isodendrion longifolium, Labordia lydgatei, Labordia tinifolia* var. *wahiawaensis, Myrsine linearifolia, Viola helenae,* and *Viola kauaiensis* var. *wahiawaensis.* This unit contains a total of 1,682.29 ha (4,156.93 ac). The lands contained within this unit are owned by the State of Hawaii and private owners. Portions of this unit are contained within the State's Lihue-Koloa Forest Reserve. The natural features and landmarks found in this area are portions of Hanapepe Valley, Kapalaoa Peak, Hulua Peak, portions of Wahiawa Stream, Kanaele Swamp, Kahili Peak, Laauhihaihai Peak, Kalualea Peak, Puu Kolo Peak, portions of Wainonoia Stream, and Puuauuka Peak. This unit is bounded on the south by Alexander Reservoir and on the west by Hanapepe Valley and Stream.

Kauai M

The proposed Kauai M provides critical habitat for eight species: *Brighamia insignis, Delissea rhytidosperma, Isodendrion longifolium, Lipochaeta micrantha, Munroidendron racemosum, Peucedanum sandwicense, Pteralyxia kauaiensis,* and *Schiedea nuttallii.* This unit contains a total of 482.16 ha (1,191.42 ac) on privately owned lands within the Haupu Mountain Range. The natural features found within this unit are Haupu Peak, Naluakeina Peak, and Queen Victoria's profile. A length of 1,730.72 m of the Haupu Range ridgeline to the west and 2,036.42 m of the Haupu Range ridgeline to east of Haupu Peak are included in this unit. This unit is bound on the north by Kipu; on the southeast by Kipu Kai; and on the southwest by Mahaulepu.

Kauai N

The proposed Kauai N provides critical habitat for two species: *Hibiscus clayi* and *Munroidendron racemosum.* This unit contains a total of 286.14 ha (707.06 ac). The area found in the Nonou Forest Reserve, owned by the State of Hawaii. The natural features found within this unit are the Nonou Mountain Range, Sleeping Giant, and Nonou Peak. This unit is bounded on the east by Wailua; on the south by the Wailua River; on the southwest by the Wailua Homesteads; and on the north by the Twin Reservoirs.

Kauai O

The proposed Kauai O provides critical habitat for 2 species: *Cyrtandra limahuliensis* and *Cyanea recta.* This unit contains a total of 242.79 ha (599.93 ac) on State and privately owned lands. This unit is found within the State's Kealia and Lihue-Koloa Forest Reserves. The natural features found in this area are Kupakanui Falls, Kualapa Peak, portions of Keahua Stream, and portions of Waipunaea Stream.

Kauai P

The proposed Kauai P provides critical habitat for 10 species: *Adenophorus periens, Cyanea recta, Cyanea remyi, Cyrtandra cyaneoides, Cyrtandra limahuliensis, Hesperomannia lydgatei, Isodendrion longifolium, Labordia lydgatei, Myrsine linearifolia,* and *Plantago princeps.* This unit contains a total of 711.44 ha (1,757.96 ac). The lands contained within this unit are owned by the State of Hawaii and private owners. Portions of this unit are contained within the State's Halelea Forest Reserve. The natural features found in this unit are the Mamalohoa Peak, Waiopa, Namolokama Mountains, Kaliko, portions of the Lumahai River, portions of the eastern wall of the Lumahai Valley, portions of the Waioli Stream, portions of the back of Waioli Valley, portions of the western wall of Hanalei Valley, and Puu Manu. This unit is bounded on the north by Waioli Valley; on the east by Hanalei Valley; and on the west and south by Lumahai Valley.

Kauai Q

The proposed Kauai Q provides critical habitat for two species: *Cyrtandra limahuliensis* and *Pteralyxia kauaiensis.* This unit contains a total of 253.70 ha (626.89 ac). The areas contained in this unit are owned by the State of Hawaii and a private entity. Portions of this unit are contained within the State's Halelea Forest Reserve. The natural features found in this unit are the back of Waipa Valley, portions of Waipo Stream, Kapailu Peak, Waiokihi Peak, and Kapalikea Peak. The area is bounded on the west and southwest by Lumahai Valley and on the east by Waioli Valley.

Kauai R

The proposed Kauai R provides critical habitat for 8 species: *Adenophorus periens, Cyanea asarifolia, Cyanea recta, Cyanea remyi, Cyrtandra cyaneoides, Cyrtandra limahuliensis, Labordia lydgatei,* and *Phyllostegia wawrana.* This unit contains a total of 1,215.59 ha (3,003.73 ac) of State and privately owned land. Portions of this unit are found within the State's Moloaa, Kealia, and Lihue-Koloa Forest Reserves. The natural features found in this area are portions of Makaleha Mountains and Stream, portions of Kaumoku Stream, Mt. Namahana, Keoiki Peak, portions of Anahola Stream, Kahili Peak, the Pinnacle, Leleiwi Peak, Ke Ana Kolea Falls, Puu Awa Peak, and Puu Eu Peak.

Kauai S

The proposed Kauai S provides critical habitat for *Exocarpos luteolus.* This unit contains 119.08 ha (294.26 ac) of State owned land within the Kealia and Lihue-Koloa Forest Reserves. The natural features found in this area are portions of Kamalii Ridge and Kamahuna Peak, and portions of Moalepe and Makaleha Streams.

Kauai T

The proposed Kauai T provides critical habitat for 7 species: *Cyanea asarifolia, Cyanea remyi, Cyrtandra*

limahuliensis, Labordia lydgatei, Lysimachia filifolia, Plantago princeps, and *Pteralyxia kauaiensis.* This unit contains a total of 638.58 ha (1,577.95 ac). The areas contained in this unit are owned by the State of Hawaii, as well as private owners. The area included in this unit are found within the State's Lihue-Koloa Forest Reserve and Alakai Wilderness Preserve. The natural features found in this unit are Mt. Waialeale and portions of Iliiliula Stream, the north Fork of the Wailua River, the most eastern section of the Alakai Swamp, and the Hanalei River.

Kauai U

The proposed Kauai U provides critical habitat for 7 species: *Alectryon macrococcus*, *Euphorbia haeleeleana*, *Isodendrion laurifolium*, *Lipochaeta fauriei*, *Poa siphonoglossa*, *Pteralyxia kauaiensis*, and *Remya kauaiensis*. This unit contains a 392.21 ha (969.15 ac) of land owned by the State of Hawaii. Portions of this unit are found within the State's Puu Ka Pele Forest Reserve, as well as containing portions of Haeleele Ridge and Valley, portions of Polihale Ridge, and portions of Kaulaula Valley.

Niihau A

Niihau A provides critical habitat for *Cyperus trachysanthos* on Niihau. This unit contains 93.79 ha (231.76 ac) of land owned by a private entity. The entire unit falls within the Keawanui watershed and contains the lower portions of Kanaio and Mokouia Valleys.

Niihau B

Niihau B provides critical habitat for *Brighamia insignis* on Niihau. This unit contains a total of 96.76 ha (239.09 ac) of privately owned land. This entire unit falls within the Keawanui watershed and contains the Kaali Cliffs.

Effects of Critical Habitat Designation

Section 7 Consultation

Section 7(a)(2) of the Act requires Federal agencies, including the Service, to ensure that actions they fund, authorize, or carry out do not destroy or adversely modify critical habitat to the extent that the action appreciably diminishes the value of the critical habitat for the survival and recovery of the species. Individuals, organizations, States, local governments, and other non-Federal entities are affected by the designation of critical habitat only if their actions occur on Federal lands, require a Federal permit, license, or other authorization, or involve Federal funding.

Section 7(a) of the Act requires Federal agencies to evaluate their actions with respect to any species that is proposed or listed as endangered or threatened and with respect to its critical habitat, if any is designated or proposed. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR part 402. Section 7(a)(4) of the Act requires Federal agencies to confer with us on any action that is likely to jeopardize the continued existence of a proposed species or result in destruction or adverse modification of proposed critical habitat. Conference reports provide conservation recommendations to assist the agency in eliminating conflicts that may be caused by the proposed action. The conservation recommendations in a conference report are advisory.

We may issue a formal conference report if requested by a Federal agency. Formal conference reports on proposed critical habitat contain an opinion that is prepared according to 50 CFR 402.14, as if critical habitat were designated. We may adopt the formal conference report as the biological opinion when the critical habitat is designated, if no substantial new information or changes in the action alter the content of the opinion (see 50 CFR 402.10(d)).

If a species is listed or critical habitat is designated, section 7(a)(2) requires Federal agencies to ensure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of such a species or to destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency (action agency) must enter into consultation with us. Through this consultation, we would ensure that the permitted actions do not destroy or adversely modify critical habitat.

When we issue a biological opinion concluding that a project is likely to result in the destruction or adverse modification of critical habitat, we also provide reasonable and prudent alternatives to the project, if any are identifiable. Reasonable and prudent alternatives are defined at 50 CFR 402.02 as alternative actions identified during consultation that can be implemented in a manner consistent with the intended purpose of the action, that are consistent with the scope of the Federal agency's legal authority and jurisdiction, that are economically and technologically feasible, and that the Director believes would avoid the likelihood of jeopardizing the continued existence of listed species and avoid the destruction or adverse modification of critical habitat. Reasonable and prudent alternatives can vary from slight project modifications to extensive redesign or relocation of the project. Costs associated with implementing a reasonable and prudent alternative are similarly variable.

Section 4(b)(8) of the Act requires us to describe in any proposed or final regulation that designates critical habitat a description and evaluation of those activities involving a Federal action that may adversely modify such habitat or that may be affected by such designation. When determining whether any of these activities may adversely modify critical habitat, we base our analysis on the effects of the action on the entire critical habitat area and not just on the portion where the activity will occur. Adverse effects on constituent elements or segments of critical habitat do not result in an adverse modification determination unless that loss, when added to the environmental baseline, is likely to appreciably diminish the capability of the critical habitat to satisfy essential requirements of the species. In other words, activities that may destroy or adversely modify critical habitat include those that alter the primary constituent elements (defined above) to an extent that the value of critical habitat for both the survival and recovery of any of the 76 plant species is appreciably reduced.

To properly portray the effects of critical habitat designation, we must first compare the section 7 requirements for actions that may affect critical habitat with the requirements for actions that may affect a listed species. Section 7 prohibits actions funded, authorized, or carried out by Federal agencies from jeopardizing the continued existence of a listed species or destroying or adversely modifying the listed species' critical habitat. Actions likely to ''jeopardize the continued existence'' of a species are those that would appreciably reduce the likelihood of the species' survival and recovery (50 CFR 402.02). Actions likely to ''destroy or adversely modify'' critical habitat are those that would appreciably reduce the value of critical habitat for the survival and recovery of the listed species (50 CFR 402.02).

Common to both definitions is an appreciable detrimental effect on both survival and recovery of a listed species. Given the similarity of these definitions, actions likely to destroy or adversely modify critical habitat would almost always result in jeopardy to the species concerned when the habitat is occupied by the species. The purpose of designating critical habitat is to contribute to a species' conservation,

which by definition equates to survival and recovery. Section 7 prohibitions against the destruction or adverse modification of critical habitat apply to actions that would impair survival and recovery of the listed species, thus providing a regulatory means of ensuring that Federal actions within critical habitat are considered in relation to the goals and recommendations of any existing recovery plan for the species concerned. As a result of the direct link between critical habitat and recovery, the prohibition against destruction or adverse modification of the critical habitat should provide for the protection of the critical habitat's ability to contribute fully to a species' recovery.

Activities on lands being proposed as critical habitat for these 76 species or activities that may indirectly affect such lands and that are conducted by a Federal agency, are funded by a Federal agency, or require a permit from a Federal agency will be subject to the section 7 consultation process. Federal actions not affecting critical habitat, as well as actions on non-Federal lands that are not federally funded or permitted, will not require section 7 consultation.

Section 4(b)(8) of the Act requires us to briefly describe and evaluate in any proposed or final regulation that designates critical habitat those activities involving a Federal action that may adversely modify such habitat or that may be affected by such designation. Activities that may destroy or adversely modify critical habitat would be those that alter the primary constituent elements to the extent that the value of critical habitat for both the survival and recovery of any one of the 76 species is appreciably reduced. We note that such activities may also jeopardize the continued existence of the species. Activities that, when carried out, funded, or authorized by a Federal agency, may directly or indirectly destroy or adversely modify critical habitat include, but are not limited to:

(1) Activities that appreciably degrade or destroy habitat defined as a primary constituent element, including but not limited to: overgrazing; maintenance of feral ungulates; clearing or cutting of native live trees and shrubs, whether by burning or mechanical, chemical, or other means (*e.g.*, woodcutting, bulldozing, construction, road building, mining, or herbicide application); introducing or enabling the spread of nonnative species; or actions that pose a risk of fire;

(2) Water diversion or impoundment, groundwater pumping, or other activity that alters water quality or quantity to an extent that wet forest or bog vegetation is significantly affected; and

(3) Recreational activities that appreciably degrade vegetation.

Actions affected by designation of critical habitat may include, but are not limited to:

(1) Regulation of activities affecting waters of the United States by the Army Corps of Engineers under section 404 of the Clean Water Act;

(2) Development on private or State lands requiring permits from other Federal agencies, such as Housing and Urban Development;

(3) Military training or similar activities of the U.S. Department of Defense (Navy and Air Force) on their lands or lands under their jurisdiction at Makaha Ridge, Pacific Missile Range Facility at Barking Sands, and Kokee Air Force Station;

(4) The release or authorization of release of biological control agents by the U.S. Department of Agriculture;

(5) Regulation of activities affecting point source pollution discharges into waters of the United States by the Environmental Protection Agency under section 402 of the Clean Water Act;

(6) Construction of communication sites licensed by the Federal Communications Commission; and

(7) Activities not previously mentioned that is funded or authorization by the U.S. Department of Agriculture (Forest Service, Natural Resources Conservation Service), Department of Defense, Department of Transportation, Department of Energy, Department of Interior (U.S. Geological Survey, National Park Service), Department of Commerce (National Oceanic and Atmospheric Administration) or any other Federal agency.

If you have questions regarding whether specific activities will constitute adverse modification of critical habitat, contact the Field Supervisor, Pacific Islands Ecological Services Field Office (see **ADDRESSES** section). Requests for copies of the regulations on listed wildlife and plants and inquiries about prohibitions and permits should be directed to the U.S. Fish and Wildlife Service, Branch of Endangered Species/Permits at the same address.

Consideration of Economic and Other Relevant Impacts

Section 4(b)(2) of the Act requires that we designate critical habitat on the basis of the best scientific and commercial information available, and to consider the economic and other relevant impacts of designating a particular area as critical habitat. We may exclude areas from critical habitat upon a determination that the benefits of such exclusions outweigh the benefits of designating these areas as critical habitat. We cannot exclude such areas from critical habitat when the exclusion will result in the extinction of the species. We will conduct an analysis of the economic impacts of designating these areas as critical habitat prior to a final determination. When completed, we will announce the availability of the draft economic analysis with a notice in the **Federal Register**, and we will reopen the comment period for 30 days at that time to accept comments on the economic analysis or further comments on the proposed rule.

Public Comments Solicited

We intend that any final action resulting from this proposal be as accurate and as effective as possible. Therefore, we solicit comments or suggestions from the public, other concerned governmental agencies, the scientific community, industry or any other interested party concerning this proposed rule.

The Service invites comments from the public that provide information on whether lands within proposed critical habitat are currently being managed to address conservation needs of these listed plants. As stated earlier in this proposed rule, if we receive information that any of the areas proposed as critical habitat are adequately managed or protected, we may exclude such areas from the final rule, because they would not meet the definition in section 3(5)(A)(i) of the Act. In determining adequacy of management, we must find that the management effort is sufficiently certain to be implemented and effective so as to contribute to the recovery of the species.

In determining whether a management effort is likely to be implemented, we would generally consider: (a) whether a management plan or agreement exists, which specifies the management actions being implemented, or to be implemented, the schedule for implementation, the responsible party(ies), and the funding source(s), or other resources necessary to implement the actions, are available with a high level of certainty that the funding will be provided; and (b) the authority and long-term commitment of the party(ies) to the agreement or plan to implement the management actions, as demonstrated, for example, by a legal instrument providing enduring protection and management of the lands.

In determining whether an action is likely to be effective, we would generally consider: (a) whether the plan specifically addresses the management needs, including reduction of threats of the species; (b) whether such actions have been successful in the past; (c) whether there are provisions for monitoring and assessment of the effectiveness of the management actions; (d) and whether adaptive management principles have been incorporated into the plan.

We are aware that the State of Hawaii and some private landowners are considering the development and implementation of land management plans or agreements that may promote the conservation and recovery of endangered and threatened plant species on the island of Kauai. We are soliciting comments in this proposed rule on whether current land management plans or practices applied within the areas proposed as critical habitat adequately provide for the recovery of the species. We are also soliciting comments on whether future development and approval of conservation measures (e.g., Conservation Agreements, Safe Harbor Agreements, *etc.*) should be excluded from critical habitat and, if so, by what mechanism.

In addition, we are seeking comments on the following:

(1) The reasons why critical habitat for any of these species is prudent or not prudent as provided by section 4 of the Act and 50 CFR 424.12(a)(1), including whether the benefits of designation would outweigh any threats to these species due to designation;

(2) The reasons why any particular area should or should not be designated as critical habitat for any of these species, as critical habitat is defined by section 3 of the Act (16 U.S.C. 1532(5));

(3) Specific information on the amount and distribution of habitat for *Adenophorus periens, Alectryon macrococcus, Alsinidendron lychnoides, Alsinidendron viscosum, Bonamia menziesii, Brighamia insignis, Centaurium sebaeoides, Chamaesyce halemanui, Cyanea asarifolia, Cyanea recta, Cyanea remyi, Cyanea undulata, Cyperus trachysanthos, Cyrtandra cyaneoides, Cyrtandra limahuliensis, Delissea rhytidosperma, Delissea rivularis, Delissea undulata, Diellia pallida, Dubautia latifolia, Dubautia pauciflorula, Euphorbia haeleeleana, Exocarpos luteolus, Flueggea neowawraea, Gouania meyenii, Hedyotis cookiana, Hedyotis st.-johnii, Hesperomannia lydgatei, Hibiscadelphus woodii, Hibiscus clayi, Hibiscus waimeae* spp. *hannerae, Isodendrion laurifolium, Isodendrion longifolium, Kokia kauaiensis, Labordia lydgatei, Labordia tinifolia* var. *wahiawaensis, Lipochaeta fauriei, Lipochaeta micrantha, Lipochaeta waimeaensis, Lobelia niihauensis, Lysimachia filifolia, Melicope haupuensis, Melicope knudsenii, Melicope pallida, Melicope quadrangularis, Munroidendron racemosum, Myrsine linearifolia, Nothocestrum peltatum, Panicum niihauense, Peucedanum sandwicense, Phyllostegia knudsenii, Phyllostegia waimeae, Phyllostegia wawrana, Plantago princeps, Platanthera holochila, Poa mannii, Poa sandvicensis, Poa siphonoglossa, Pritchardia aylmer-robinsonii, Pritchardia napaliensis, Pritchardia viscosa, Pteralyxia kauaiensis, Remya kauaiensis, Remya montgomeryi, Schiedea apokremnos, Schiedea helleri, Schiedea kauaiensis, Schiedea membranacea, Schiedea nuttallii, Schiedea spergulina* var. *leiopoda, Schiedea spergulina* var. *spergulina, Schiedea stellarioides, Sesbania tomentosa, Solanum sandwicense, Spermolepis hawaiiensis, Stenogyne campanulata, Viola helenae, Viola kauaiensis* var. *wahiawaensis, Wilkesia hobdyi, Xylosma crenatum,* and *Zanthoxylum hawaiiense,* and what habitat is essential to the conservation of the species and why;

(4) Land use practices and current or planned activities in the subject areas and their possible impacts on proposed critical habitat;

(5) Any economic or other relevant impacts resulting from the proposed designations of critical habitat, including any impacts on small entities or families; and

(6) Economic and other potential values associated with designating critical habitat for the 76 plant species such as those derived from non-consumptive uses (*e.g.,* hiking, camping, birding, enhanced watershed protection, increased soil retention, ''existence values,'' and reductions in administrative costs).

If you wish to comment, you may submit your comments and materials concerning this proposal by any one of several methods (see **ADDRESSES**). If you are sending comments by electronic mail (e-mail), please submit them in ASCII file format and avoid the use of special characters and encryption. Please include ''Attn: 1018–AG71'' and your name and return address in your e-mail message. If you do not receive a confirmation from the system that we have received your e-mail message, contact us directly by calling our Pacific Islands Office at phone number 808/541–3441. Please note that the e-mail address (KAandNIcrithab pr@fws.gov) will be closed out at the termination of the public comment period.

Our practice is to make comments, including names and home addresses of respondents, available for public review during regular business hours. Respondents may request that we withhold their home address, which we will honor to the extent allowable by law. There also may be circumstances in which we would withhold a respondent's identity, as allowable by law. If you wish us to withhold your name and/or address, you must state this request prominently at the beginning of your comment. However, we will not consider anonymous comments. To the extent consistent with applicable law, we will make all submissions from organizations or businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, available for public inspection in their entirety. Comments and materials received will be available for public inspection, by appointment, during normal business hours at the above address.

Peer Review

In accordance with our policy published on July 1, 1994 (59 FR 34270), we will seek the expert opinions of at least three appropriate and independent specialists regarding this proposed rule. The purpose of such review is to ensure listing and critical habitat decisions are based on scientifically sound data, assumptions, and analyses. We will send copies of this proposed rule to these peer reviewers immediately following publication in the **Federal Register**. We will invite the peer reviewers to comment, during the public comment period, on the specific assumptions and conclusions regarding the proposed designations of critical habitat.

We will consider all comments and data received during the 60-day comment period on this proposed rule during preparation of a final rulemaking. Accordingly, the final decision may differ from this proposal.

Clarity of the Rule

Executive Order 12866 requires each agency to write regulations and notices that are easy to understand. We invite your comments on how to make this proposed rule easier to understand including answers to questions such as the following: (1) Are the requirements in the proposed rule clearly stated? (2) Does the proposed rule contain technical language or jargon that

interferes with the clarity? (3) Does the format of the proposed rule (grouping and order of sections, use of headings, paragraphing, etc.) aid or reduce its clarity? (4) Is the description of the proposed rule in the ''Supplementary Information'' section of the preamble helpful in understanding the document? (5) Are the detailed scientific descriptions of the plants helpful, and (6) What else could we do to make the proposed rule easier to understand?

Send a copy of any comments that concern how we could make this notice easier to understand to: Office of Regulatory Affairs, Department of the Interior, Room 7229, 1849 C Street, NW, Washington, DC 20240. You may e-mail your comments to this address: Execsec@ios.doi.gov.

Required Determinations

1. Regulatory Planning and Review

In accordance with Executive Order (EO) 12866, this action was submitted for review by the Office of Management and Budget (OMB). We are in the process of preparing an economic analysis to determine the economic consequences of designating the specific areas identified as critical habitat. If our economic analysis reveals that the economic impacts of designating any area as critical habitat outweigh the benefits of designation, we may exclude those areas from consideration, unless such exclusion will result in the extinction of the species.

(a) Even though we will prepare an economic analysis to assist us in considering whether areas should be excluded pursuant to section 4 of the Act, we do not believe this proposed rule will have an annual economic effect of $100 million or adversely affect an economic sector, productivity, jobs, the environment, or other units of government. Therefore, we do not believe a cost-benefit and economic analysis pursuant to EO 12866 is required.

These 76 plants were listed as endangered or threatened species between the years 1991 and 1996. With the possible exception of portions of the Alakai Swamp, the areas proposed for critical habitat are currently occupied by one or more of these species. Under section 7 of the Act, critical habitat may not be destroyed or adversely modified by a Federal agency action; designation does not impose any restrictions on non-Federal persons unless they are conducting activities funded or otherwise sponsored or permitted by a Federal agency. Section 7 also requires Federal agencies to ensure that they do not jeopardize the continued existence of the species. Based on our experience, due to the limited number of individuals and populations, and limited range, we conclude that any Federal action or authorized action that could potentially cause an adverse modification of the proposed critical habitat for any of these 76 species would also likely cause ''jeopardy'' to that species. Accordingly, the designation of currently occupied areas as critical habitat would not have any incremental impacts on what actions may or may not be conducted by Federal agencies or non-Federal persons that receive Federal authorization or funding. Non-Federal persons that do not have a Federal involvement in their actions are not restricted by the designation of critical habitat. It is possible that some unoccupied habitat in the Alakai Swamp has been proposed as critical habitat. However, the Alakai Swamp is unlikely to be developed because it is a designated State wilderness preserve, and therefore, any possible inclusion of unoccupied habitat that might not otherwise be covered by section 7 is unlikely to have an economic impact.

(b) This proposed rule will not create inconsistencies with other agencies' actions. As discussed above, Federal agencies have been required to ensure that their actions not jeopardize the continued existence of these 76 plant species since their listing between 1991 and 1996. The prohibition against adverse modification of critical habitat would not be expected to impose any additional restrictions to those that currently exist because all proposed critical habitat is occupied, with the exception, possibly, of portions of the Alakai Swamp.

(c) This proposed rule will not materially affect entitlements, grants, user fees, loan programs, or the rights and obligations of their recipients. Federal agencies are currently required to ensure that their activities do not jeopardize the continued existence of the species, and as discussed above we do not anticipate that the adverse modification prohibition resulting from critical habitat designation will have any incremental effects.

(d) This proposed rule will not raise novel legal or policy issues. The proposed rule follows the requirements for determining critical habitat contained in the Endangered Species Act.

2. Regulatory Flexibility Act (5 U.S.C. 601 et seq.)

In the economic analysis, we will determine whether designation of critical habitat will have a significant effect on a substantial number of small entities. As discussed under Regulatory Planning and Review above, this proposed rule is not expected to result in any restrictions in addition to those currently in existence. As indicated on Table 5 (see ''Methods for Selection of Areas for Proposed Critical Habitat Designations'') we have designated property owned by Federal and State governments, and private property.

Within these areas, the types of Federal actions or authorized activities that we have identified as potential concerns are:

(1) Regulation of activities affecting waters of the United States by the Army Corps of Engineers under section 404 of the Clean Water Act;

(2) Development on private or State lands requiring permits from other Federal agencies such as Housing and Urban Development;

(3) Military training or similar activities of the U.S. Department of Defense (Navy and Air Force) on their lands or lands under their jurisdiction;

(4) The release or authorization of release of biological control agents by the U.S. Department of Agriculture;

(5) Regulation of activities affecting point source pollution discharges into waters of the United States by the Environmental Protection Agency under section 402 of the Clean Water Act;

(6) Construction of communication sites licensed by the Federal Communications Commission;

(7) Activities not previously mentioned that are funded or authorized by the U.S. Department of Agriculture (Forest Service, Natural Resources Conservation Service), Department of Defense, Department of Transportation, Department of Energy, Department of Interior (U.S. Geological Survey, National Park Service), Department of Commerce (National Oceanic and Atmospheric Administration) or any other Federal agency.

Many of these activities authorized or funded by Federal agencies within the proposed critical habitat areas are carried out by small entities (as defined by the Regulatory Flexibility Act) through contract, grant, permit, or other Federal authorization. As discussed in section 1 above, these actions are currently required to comply with the protections of the Act that are triggered by listing, such as avoiding jeopardy to these species, and the designation of critical habitat is not anticipated to have any additional effects on these activities.

For actions on non-Federal property that do not have a Federal connection (such as funding or authorization), the current State restrictions concerning

take of listed threatened or endangered plant species remain in effect, and this proposed rule will have no additional restrictions.

3. Small Business Regulatory Enforcement Fairness Act (5 U.S.C. 804(2))

In the economic analysis, we will determine whether designation of critical habitat will cause (a) any effect on the economy of $100 million or more, (b) any increases in costs or prices for consumers, individual industries, Federal, State, or local government agencies, or geographic regions in the economic analysis, or (c) any significant adverse effects on competition, employment, investment, productivity, innovation, or the ability of U.S.-based enterprises to compete with foreign-based enterprises.

4. Unfunded Mandates Reform Act (2 U.S.C. 1501 et seq.)

In accordance with the Unfunded Mandates Reform Act (2 U.S.C. 1501 *et seq.*):

(a) This proposed rule will not ''significantly or uniquely'' affect small governments. A Small Government Agency Plan is not required. Small governments will only be affected to the extent that any Federal funds, permits or other authorized activities must ensure that their actions will not adversely affect the critical habitat. However, as discussed in section 1, these actions are currently subject to equivalent requirements through the listing protections of the species, and no further restrictions are anticipated.

(b) This proposed rule will not produce a Federal mandate of $100 million or greater in any year, that is, it is not a ''significant regulatory action'' under the Unfunded Mandates Reform Act. The designation of critical habitat imposes no obligations on State or local governments.

5. Takings

In accordance with Executive Order 12630, this proposed rule does not have significant takings implications. A takings implication assessment is not required. As discussed above, the designation of critical habitat affects only Federal agency actions. The proposed rule will not increase or decrease the current restrictions on private property concerning take of these 76 plant species. We do not anticipate that property values will be affected by the critical habitat designations. Landowners in areas that are included in the designated critical habitat will continue to have opportunity to utilize their property in ways consistent with State law and with the continued survival of the plant species.

6. Federalism

In accordance with Executive Order 13132, the proposed rule does not have significant Federalism effects. A Federalism assessment is not required. As discussed above, the designation of critical habitat in areas currently occupied by the 76 plant species would have little incremental impact on State and local governments and their activities. The designations may have some benefit to these governments in that the areas essential to the conservation of these species are more clearly defined, and the primary constituent elements of the habitat necessary to the survival of the species are identified. While this definition and identification does not alter where and what Federally sponsored activities may occur, it may assist these local governments in long range planning rather than waiting for case-by-case section 7 consultation to occur.

7. Civil Justice Reform

In accordance with Executive Order 12988, the Office of the Solicitor has determined that the proposed rule does not unduly burden the judicial system and meets the requirements of sections 3(a) and 3(b)(2) of the Order. We designate critical habitat in accordance with the provisions of the Endangered Species Act. The proposed rule uses standard property descriptions and identifies the primary constituent elements within the designated areas to assist the public in understanding the habitat needs of the 76 plant species.

8. Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.)

This proposed rule does not contain any information collection requirements for which OMB approval under the Paperwork Reduction Act is required.

9. National Environmental Policy Act

We have determined that an Environmental Assessment and/or an Environmental Impact Statement as defined by the National Environmental Policy Act of 1969 need not be prepared in connection with regulations adopted pursuant to section 4(a) of the Act. A notice outlining our reason for this determination was published in the **Federal Register** on October 25, 1983 (48 FR 49244). This proposed rule does not constitute a major Federal action significantly affecting the quality of the human environment.

References Cited

A complete list of all references cited in this proposed rule is available upon request from the Pacific Islands Ecoregion Office (see **ADDRESSES** section).

Authors

The primary authors of this notice are Stacy Jorgensen, Christa Russell, Michelle Stephens, and Marigold Zoll (see **ADDRESSES** section).

List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Reporting and record-keeping requirements, Transportation.

Proposed Regulation Promulgation

Accordingly, we propose to amend part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations as set forth below:

PART 17—[AMENDED]

1. The authority citation for part 17 continues to read as follows:

Authority: 16 U.S.C. 1361–1407; 16 U.S.C. 1531–1544; 16 U.S.C. 4201–4245; Pub. L. 99–625, 100 Stat. 3500; unless otherwise noted.

2. In § 17.12(h) revise the entries for *''Alectryon macrococcus, Alsinidendron lychnoides, Alsinidendron viscosum, Bonamia menziesii, Brighamia insignis, Centaurium sebaeoides, Chamaesyce halemanui, Cyanea asarifolia, Cyanea recta, Cyanea remyi, Cyanea undulata, Cyperus trachysanthos, Cyrtandra cyaneoides, Cyrtandra limahuliensis, Delissea rhytidosperma, Delissea rivularis, Delissea undulata, Dubautia latifolia, Dubautia pauciflorula, Euphorbia haeleeleana, Exocarpos luteolus, Flueggea neowawraea, Gouania meyenii, Hedyotis cookiana, Hedyotis st.-johnii, Hesperomannia lydgatei, Hibiscadelphus woodii, Hibiscus clayi, Hibiscus waimeae spp. hannerae, Isodendrion laurifolium, Isodendrion longifolium, Kokia kauaiensis, Labordia lydgatei, Labordia tinifolia var. wahiawaensis, Lipochaeta fauriei, Lipochaeta micrantha, Lipochaeta waimeaensis, Lobelia niihauensis, Lysimachia filifolia, Melicope haupuensis, Melicope knudsenii, Melicope pallida, Munroidendron racemosum, Myrsine linearifolia, Nothocestrum peltatum, Panicum niihauense, Peucedanum sandwicense, Phyllostegia knudsenii, Phyllostegia wawrana, Plantago princeps, Platanthera holochila, Poa mannii, Poa sandvicensis, Poa siphonoglossa, Pteralyxia kauaiensis, Remya kauaiensis, Remya montgomeryi, Schiedea apokremnos, Schiedea helleri, Schiedea kauaiensis, Schiedea*

membranacea, Schiedea nuttallii, Schiedea spergulina var. leiopoda, Schiedea spergulina var. spergulina, Schiedea stellarioides, Sesbania tomentosa, Solanum sandwicense, Spermolepis hawaiiensis, Stenogyne campanulata, Viola helenae, Viola kauaiensis var. *wahiawaensis, Wilkesia hobdyi, Xylosma crenatum,* and *Zanthoxylum hawaiiense''* under ''FLOWERING PLANTS'' and *''Adenophorus periens* and *Diellia pallida''* under ''FERNS AND ALLIES'' to read as follows:

17.12(h) Endangered and threatened plants.

* * * * *

(h) * * *

Species		Historic range	Family	Status	When listed	Critical habitat	Special rules
Scientific name	Common name						
FLOWERING PLANTS							
*	*	*	*	*	*	*	
Alectryon macrococcus.	Mahoe	U.S.A. (HI)	Sapindaceae	E	467	17.96(a)	NA
*	*	*	*	*	*	*	
Alsinidendron lychnoides.	Kuawawaenohu	U.S.A. (HI)	Caryophyllaceae	E	590	17.96(a)	NA
Alsinidendron viscosum.	None	U.S.A. (HI)	Caryophyllaceae	E	590	17.96(a)	NA
*	*	*	*	*	*	*	
Bonamia menziesii	None	U.S.A. (HI)	Convolvulaceae	E	559	17.96(a)	NA
Brighamia insignis	'Olulu	U.S.A. (HI)	Campanulaceae	E	530	17.96(a)	NA
*	*	*	*	*	*	*	
Centaurium sebaeoides.	'Awiwi	U.S.A. (HI)	Gentianaceae	E	448	17.96(a)	NA
*	*	*	*	*	*	*	
Chamaesyce halemanui.	None	U.S.A. (HI)	Euphorbiaceae	E	464	17.96(a)	NA
*	*	*	*	*	*	*	
Cyanea asarifolia	Haha	U.S.A (HI)	Campanulaceae	E	530	17.96(a)	NA
*	*	*	*	*	*	*	
Cyanea recta	Haha	U.S.A (HI)	Campanulaceae	T	590	17.96(a)	NA
Cyanea remyi	Haha	U.S.A (HI)	Campanulaceae	E	590	17.96(a)	NA
*	*	*	*	*	*	*	
Cyanea undulata	Haha	U.S.A. (HI)	Campanulaceae	E	436	17.96(a)	NA
*	*	*	*	*	*	*	
Cyperus trachysanthos.	Pu'uka'a	U.S.A. (HI)	Cyperaceae	E	592	17.96(a)	NA
*	*	*	*	*	*	*	
Cyrtandra cyaneoides	Mapele	U.S.A. (HI)	Gesneriaceae	E	590	17.96(a)	NA
*	*	*	*	*	*	*	
Cyrtandra limahuliensis.	Ha'iwale'	U.S.A. (HI)	Gesneriaceae	T	530	17.96(a)	NA
*	*	*	*	*	*	*	
Delissea rhytidosperma.	None	U.S.A. (HI)	Campanulaceae	E	530	17.96(a)	NA
Delissea rivularis	'Oha'	U.S.A. (HI)	Campanulaceae	E	590	17.96(a)	NA
*	*	*	*	*	*	*	
Delissea undulata	None	U.S.A. (HI)	Campanulaceae	E	593	17.96(a)	NA
*	*	*	*	*	*	*	
Dubautia latifolia	Na'ena'e'	U.S.A. (HI)	Asteraceae	E	464	17.96(a)	NA
Dubautia pauciflorula	Na'ena'e'	U.S.A. (HI)	Asteraceae	E	436	17.96(a)	NA
*	*	*	*	*	*	*	
Euphorbia haeleeleana.	'Akoko	U.S.A. (HI)	Euphorbiaceae	E	592	17.96(a)	NA
*	*	*	*	*	*	*	
Exocarpos luteolus	Heau	U.S.A. (HI)	Santalaceae	E	530	17.96(a)	NA

Species		Historic range	Family	Status	When listed	Critical habitat	Special rules
Scientific name	Common name						
*	*	*	*	*	*	*	
Flueggea neowawraea	Mehamehame	U.S.A. (HI)	Euphorbiaceae	E	559	17.96(a)	NA
*	*	*	*	*	*	*	
Gouania meyenii	None	U.S.A. (HI)	Rhamnaceae	E	448	17.96(a)	NA
*	*	*	*	*	*	*	
Hedyotis cookiana	'Awiwi	U.S.A. (HI)	Rubiaceae	E	530	17.96(a)	NA
*	*	*	*	*	*	*	
Hedyotis st.-johnii	Na Pali beach hedyotis.	U.S.A. (HI)	Rubiaceae	E	441	17.96(a)	NA
*	*	*	*	*	*	*	
Hesperomannia lydgatei	None	U.S.A. (HI)	Asteraceae	E	436	17.96(a)	NA
*	*	*	*	*	*	*	
Hibiscadelphus woodii	Hau kuahiwi	U.S.A. (HI)	Malvaceae	E	590	17.96(a)	NA
*	*	*	*	*	*	*	
Hibiscus clayi	Clay's hibiscus	U.S.A. (HI)	Malvaceae	E	530	17.96(a)	NA
Hibiscus waimeae spp. *hannerae*	Koki'o ke'oke'o	U.S.A. (HI)	Malvaceae	E	590	17.96(a)	NA
*	*	*	*	*	*	*	
Isodendrion laurifolium	Aupaka	U.S.A. (HI)	Violaceae	E	592	17.96(a)	NA
Isodendrion longifolium	Aupaka	U.S.A. (HI)	Violaceae	T	592	17.96(a)	NA
*	*	*	*	*	*	*	
Kokia kauaiensis	Koki'o	U.S.A. (HI)	Malvaceae	E	590	17.96(a)	NA
*	*	*	*	*	*	*	
Labordia lydgatei	Kamakahala	U.S.A. (HI)	Loganiaceae	E	436	17.96(a)	NA
Labordia tinifolia var. *wahiawaensis*	Kamakahala	U.S.A. (HI)	Loganiaceae	E	590	17.96(a)	NA
*	*	*	*	*	*	*	
Lipochaeta fauriei	Nehe	U.S.A. (HI)	Asteraceae	E	530	17.96(a)	NA
*	*	*	*	*	*	*	
Lipochaeta micrantha	Nehe	U.S.A. (HI)	Asteraceae	E	530	17.96(a)	NA
*	*	*	*	*	*	*	
Lipochaeta waimeaensis	Nehe	U.S.A. (HI)	Asteraceae	E	530	17.96(a)	NA
*	*	*	*	*	*	*	
Lobelia niihauensis	None	U.S.A. (HI)	Campanulaceae	E	448	17.96(a)	NA
*	*	*	*	*	*	*	
Lysimachia filifolia	None	U.S.A. (HI)	Primulaceae	E	530	17.96(a)	NA
*	*	*	*	*	*	*	
Melicope haupuensis	Alani	U.S.A. (HI)	Rutaceae	E	530	17.96(a)	NA
Melicope knudsenii	Alani	U.S.A. (HI)	Rutaceae	E	530	17.96(a)	NA
*	*	*	*	*	*	*	
Melicope pallida	Alani	U.S.A. (HI)	Rutaceae	E	530	17.96(a)	NA
*	*	*	*	*	*	*	
Munroidendron racemosum	None	U.S.A. (HI)	Araliaceae	E	530	17.96(a)	NA
*	*	*	*	*	*	*	
Myrsine linearifolia	Kolea	U.S.A. (HI)	Myrsinaceae	T	590	17.96(a)	NA

Species		Historic range	Family	Status	When listed	Critical habitat	Special rules
Scientific name	Common name						
*	*	*	*	*	*	*	
Nothocestrum peltatum.	'Aiea	U.S.A. (HI)	Solanaceae	E	530	17.96(a)	NA
*	*	*	*	*	*	*	
Panicum niihauense	Lau 'ehu	U.S.A. (HI)	Poaceae	E	592	17.96(a)	NA
*	*	*	*	*	*	*	
Peucedanum sandwicense.	Makou	U.S.A. (HI)	Apiaceae	T	530	17.96(a)	NA
*	*	*	*	*	*	*	
Phyllostegia knudsenii.	None	U.S.A. (HI)	Lamiaceae	E	590	17.96(a)	NA
*	*	*	*	*	*	*	
Phyllostegia wawrana	None	U.S.A. (HI)	Lamiaceae	E	590	17.96(a)	NA
*	*	*	*	*	*	*	
Plantago princeps	Laukahi kuahiwi	U.S.A. (HI)	Plantaginaceae	E	559	17.96(a)	NA
Platanthera holochila	None	U.S.A. (HI)	Orchidaceae	E	592	17.96(a)	NA
*	*	*	*	*	*	*	
Poa mannii	Mann's bluegrass	U.S.A. (HI)	Poaceae	E	558	17.96(a)	NA
*	*	*	*	*	*	*	
Poa sandvicensis	Hawaiian bluegrass	U.S.A. (HI)	Poaceae	E	464	17.96(a)	NA
Poa siphonoglossa	None	U.S.A. (HI)	Poaceae	E	464	17.96(a)	NA
*	*	*	*	*	*	*	
Pteralyxia kauaiensis	Kaulu	U.S.A. (HI)	Apocynaceae	E	530	17.96(a)	NA
*	*	*	*	*	*	*	
Remya kauaiensis	None	U.S.A. (HI)	Asteraceae	E	413	17.96(a)	NA
*	*	*	*	*	*	*	
Remya montgomeryi	None	U.S.A. (HI)	Asteraceae	E	413	17.96(a)	NA
*	*	*	*	*	*	*	
Schiedea apokremnos.	Ma'oli'oli	U.S.A. (HI)	Caryophyllaceae	E	441	17.96(a)	NA
*	*	*	*	*	*	*	
Schiedea helleri	None	U.S.A. (HI)	Caryophyllaceae	E	590	17.96(a)	NA
*	*	*	*	*	*	*	
Schiedea kauaiensis	None	U.S.A. (HI)	Caryophyllaceae	E	592	17.96(a)	NA
*	*	*	*	*	*	*	
Schiedea membranacea.	None	U.S.A. (HI)	Caryophyllaceae	E	590	17.96(a)	NA
Schiedea nuttallii	None	U.S.A. (HI)	Caryophyllaceae	E	592	17.96(a)	NA
*	*	*	*	*	*	*	
Schiedea spergulina var. *leiopoda.*	None	U.S.A. (HI)	Caryophyllaceae	E	530	17.96(a)	NA
Schiedea spergulina var. *spergulina.*	None	U.S.A. (HI)	Caryophyllaceae	T	530	17.96(a)	NA
Schiedea stellarioides	Laulihilihi (Ma'oli'oli)	U.S.A. (HI)	Caryophyllaceae	E	590	17.96(a)	NA
*	*	*	*	*	*	*	
Sesbania tomentosa	'Ohai	U.S.A. (HI)	Fabaceae	E	559	17.96(a)	NA
*	*	*	*	*	*	*	
Solanum sandwicense.	'Aiakeakua, popolo	U.S.A. (HI)	Solanaceae	E	530	17.96(a)	NA
*	*	*	*	*	*	*	
Spermolepis hawaiiensis.	None	U.S.A. (HI)	Apiaceae	E	559	17.96(a)	NA

Species		Historic range	Family	Status	When listed	Critical habitat	Special rules
Scientific name	Common name						
*	*	*	*	*	*	*	
Stenogyne campanulata.	None	U.S.A. (HI)	Lamiaceae	E	464	17.96(a)	NA
*	*	*	*	*	*	*	
Viola helenae	None	U.S.A. (HI)	Violaceae	E	436	17.96(a)	NA
Viola kauaiensis var. *wahiawaensis.*	Nani wai'ale'ale	U.S.A. (HI)	Violaceae	E	590	17.96(a)	NA
*	*	*	*	*	*	*	
Wilkesia hobdyi	Dwarf iliau	U.S.A. (HI)	Asteraceae	E	473	17.96(a)	NA
Xylosma crenatum	None	U.S.A. (HI)	Flacourtiaceae	E	464	17.96(a)	NA
*	*	*	*	*	*	*	
Zanthoxylum hawaiiense.	A'e	U.S.A. (HI)	Rutaceae	E	532	17.96(a)	NA
*	*	*	*	*	*	*	
FERNS AND ALLIES							
Adenophorus periens	Pendant kihi fern	U.S.A. (HI)	Grammitidaceae	E	559	17.96(a)	NA
*	*	*	*	*	*	*	
Diellia pallida	None	U.S.A. (HI)	Aspleniaceae	E	530	17.96(a)	NA
*	*	*	*	*	*	*	

3. In § 17.96, redesignate paragraph (a) as paragraph (b); revise heading of newly designated paragraph (b) to read ''Single-species critical habitat—flowering plants''; and add a new paragraph (a) to read as follows:

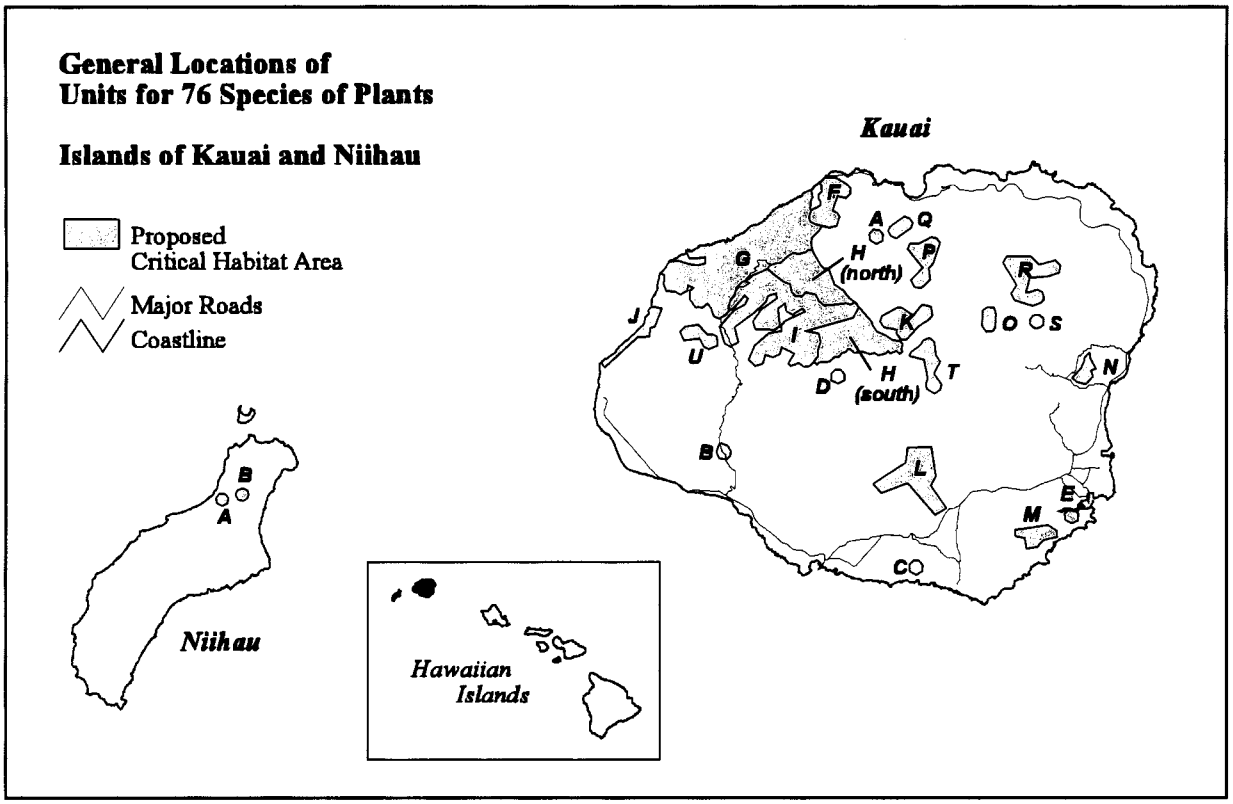
§ 17.96 Critical habitat—plants.

(a) *Unit Descriptions and Maps of multiple-species critical habitat units.*

(1) Hawaii.

(i) Maps and critical habitat unit descriptions.

(A) Kauai.

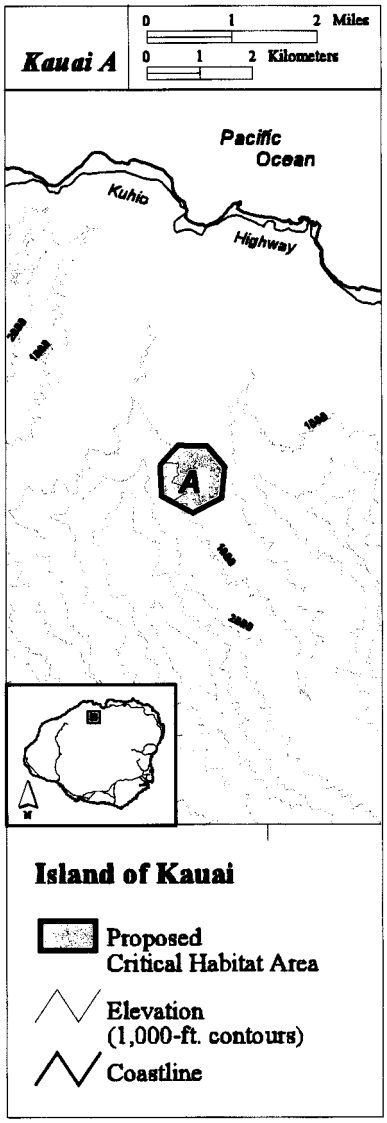


Critical habitat units with multiple species are described below. Coordinates are in UTM Zone 4 with units in meters using North American Datum of 1983 (NAD83). Distances are provided in meters and miles.

Kauai A (121 ha; 298 ac)

Unit consists of seven boundary points with the following coordinates: 443666, 2452051; 443998, 2452413; 444554, 2452401; 444886, 2452015; 444832, 2451423; 444282, 2451133; 443696, 2451454.

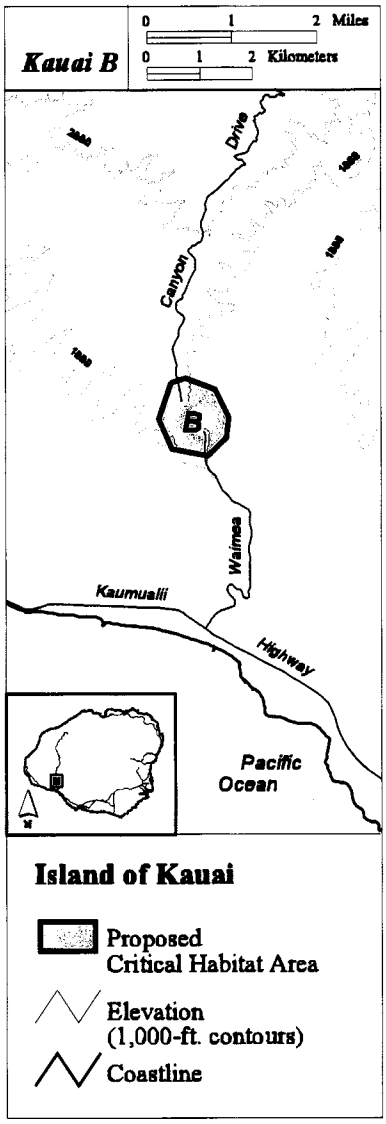
Note: Map follows:



Kauai B (142 ha; 351 ac)

Unit consists of eight boundary points with the following coordinates: 429954, 2432936; 430228, 2433024; 430792, 2432813; 431050, 2432278; 431007, 2431901; 430646, 2431556; 429966, 2431685; 429725, 2432253.

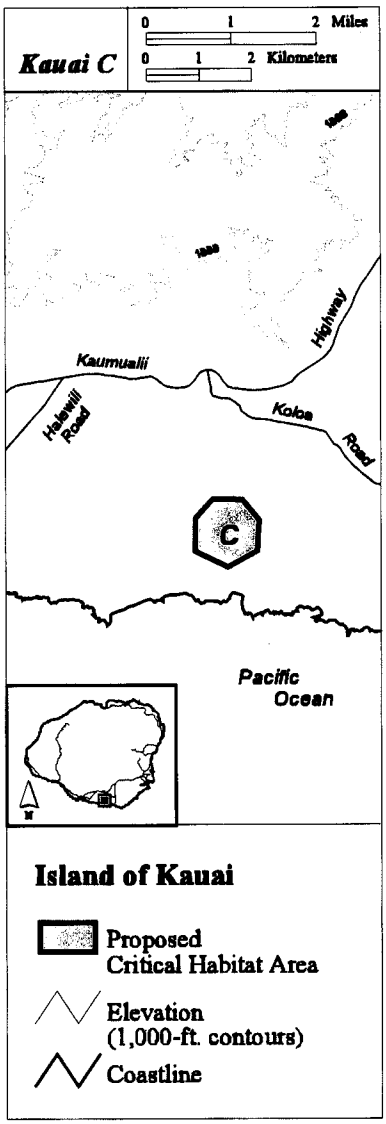
Note: Map follows:



Kauai C (124 ha; 306 ac)

Unit consists of seven boundary points with the following coordinates: 447275, 2421965; 447607, 2422327; 448163, 2422315; 448481, 2421928; 448450, 2421347; 447896, 2421028; 447268, 2421332.

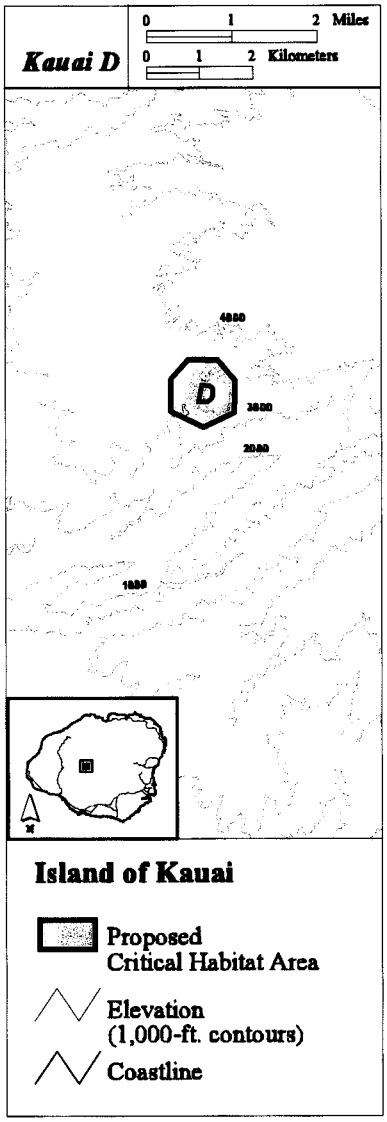
Note: Map follows:



Kauai D (125 ha; 308 ac)

Unit consists of seven boundary points with the following coordinates: 440157, 2439356; 440489, 2439719; 441045, 2439706; 441377, 2439320; 441355, 2438717; 440773, 2438438; 440155, 2438734.

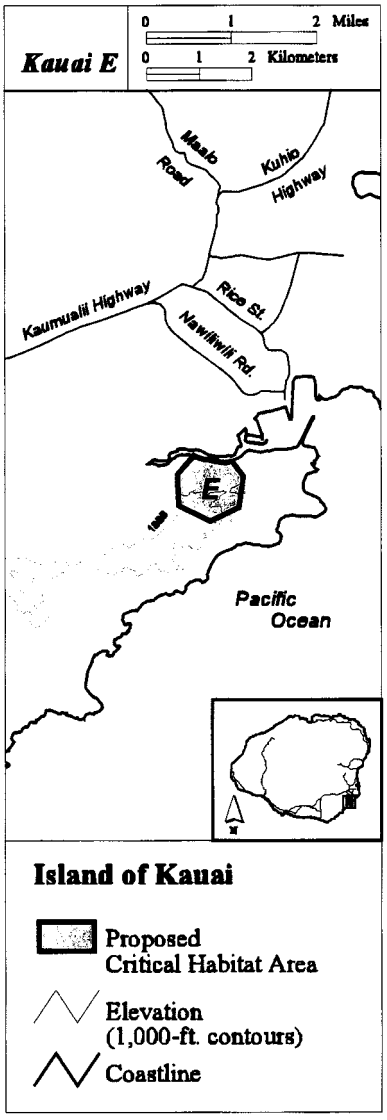
Note: Map follows:



Kauai E (117 ha; 288 ac)

Unit consists of seven boundary points and the intermediate coastline with the following coordinates: 462461, 2426866; 462686, 2426588; 462598, 2425988; 462047, 2425726; 461453, 2426032; 461432, 2426617; 461741, 2426979.

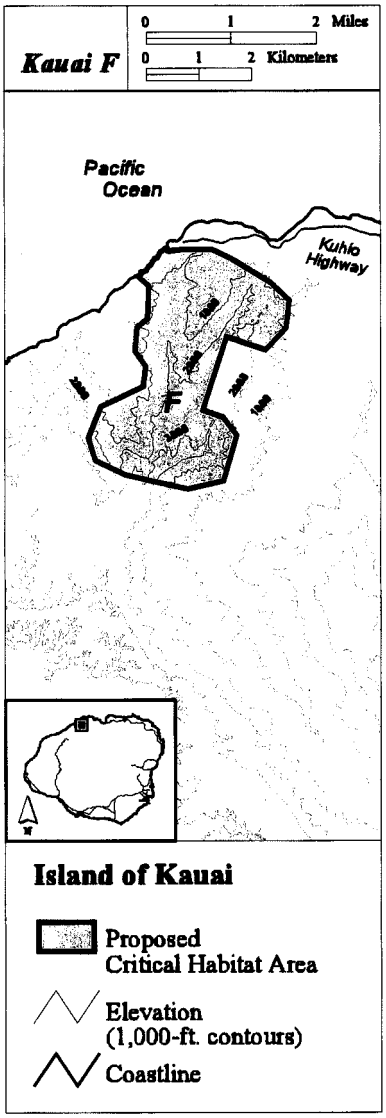
Note: Map follows:



Kauai F (943 ha; 2,330 ac)

Unit consists of twenty-seven boundary points and the intermediate coastline with the following coordinates: 439582, 2457190; 439646, 2457137; 439870, 2457165; 440480, 2457164; 440853, 2456992; 441585, 2456539; 441928, 2456203; 441875, 2455686; 441477, 2455265; 440747, 2455513; 440294, 2454127; 440678, 2454002; 440939, 2453662; 440687, 2452786; 440011, 2452638; 439324, 2452794; 438821, 2452909; 438249, 2453179; 438122, 2453607; 438356, 2454207; 439171, 2454579; 439213, 2454955; 439014, 2455248; 439053, 2455692; 439249, 2455858; 439274, 2456481; 439060, 2456669.

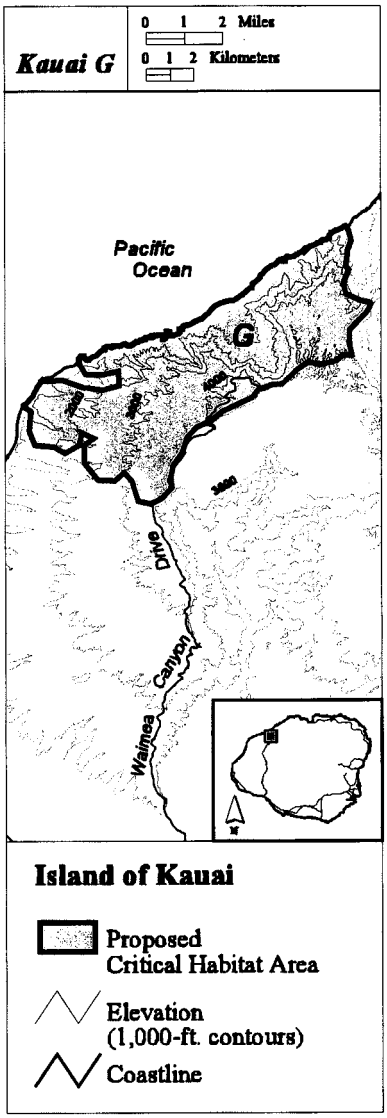
Note: Map follows:



Kauai G (6,372 ha; 15,752 ac)

Unit consists of sixty-one boundary points and two intermediate stretches of coastline with the following coordinates: 438237, 2456026; 438340, 2455904; 438452, 2455418; 438302, 2455008; 438227, 2454336; 438356, 2454207; 438122, 2453607; 438249, 2453179; 438821, 2452909; 439324, 2452794; 439098, 2452402; 438390, 2451683; 438377, 2451066; 438479, 2450630; 438081, 2450611; 437856, 2450386; 437196, 2450236; 436686, 2450327; 436206, 2450012; 435576, 2449428; 435171, 2449398; 434571, 2449188; 434346, 2448873; 433716, 2448589; 433056, 2448274; 432606, 2447884; 431976, 2447600; 431571, 2447195; 431376, 2446520; 431001, 2446041; 430881, 2445501; 430956, 2445096; 430506, 2444616; 430055, 2444390; 429511, 2444515; 429264, 2445339; 428958, 2445710; 428546, 2445373; 427836, 2445411; 427275, 2446121; 427275, 2446869; 427649, 2447167; 427163, 2447392; 427051, 2446869; 426453, 2446532; 426005, 2446794; 425182, 2446869; 424958, 2447466; 425033, 2448288; 424734, 2448475; 424703, 2448535; 425519, 2449626; 425631, 2449559; 426331, 2449614; 427201, 2449297; 428060, 2449185; 428733, 2449372; 428696, 2449969; 427986, 2449820; 427327, 2449846; 427036, 2450343.

Note: Map follows:



Kauai H North (1,893 ha; 4,678 ac)

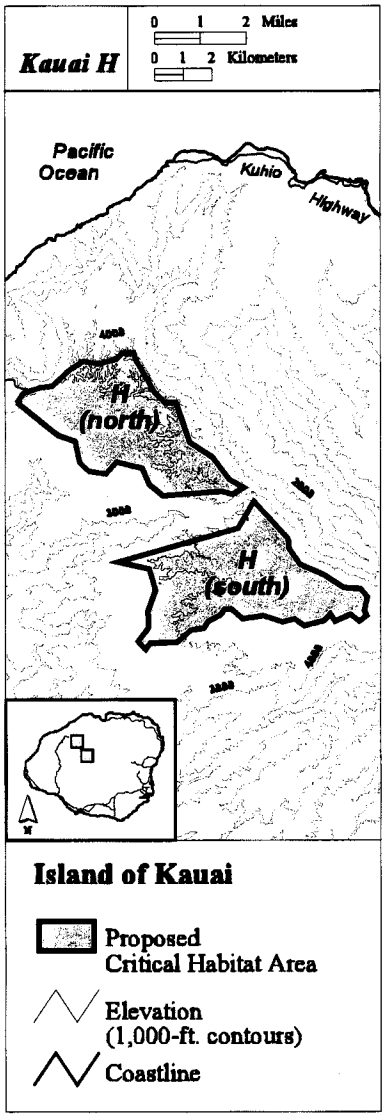
Unit consists of thirty boundary points with the following coordinates: 438479, 2450630; 438530, 2450411; 439197, 2449222; 439559, 2448851; 439963, 2448868; 440449, 2447452; 441231, 2446950; 441832, 2446159; 442326, 2445855; 441941, 2445618; 441564, 2445724; 440439, 2445635; 439481, 2445574; 439012, 2445981; 438755, 2446540; 437858, 2446764; 437473, 2446353; 436897, 2446435; 436567, 2446737; 436399, 2447492; 435795, 2447718; 434346, 2448873; 434571, 2449188; 435171, 2449398; 435576, 2449428; 436206, 2450012; 436686, 2450327; 437196, 2450236; 437856, 2450386; 438081, 2450611.

Note: Map follows:

Kauai H South (2,053 ha; 5,072 ac)

Unit consists of thirty-six boundary points with the following coordinates: 442681, 2445377; 443901, 2444045; 443929, 2443735; 444310, 2443141; 445138, 2442798; 445835, 2442346; 446429, 2442286; 446674, 2441998; 446559, 2441513; 446662, 2441347; 446394, 2441140; 446090, 2441397; 445534, 2441154; 445380, 2441414; 445147, 2441167; 444455, 2440991; 444124, 2441223; 443707, 2441132; 443023, 2441344; 442289, 2441224; 441900, 2441577; 441650, 2441573; 441526, 2441372; 441085, 2441150; 440912, 2440914; 440464, 2440832; 440002, 2440430; 439021, 2440374; 438871, 2440154; 438599, 2440452; 438983, 2440918; 438956, 2441522; 439226, 2442251; 439011, 2443004; 437912, 2443251; 442140, 2444430.

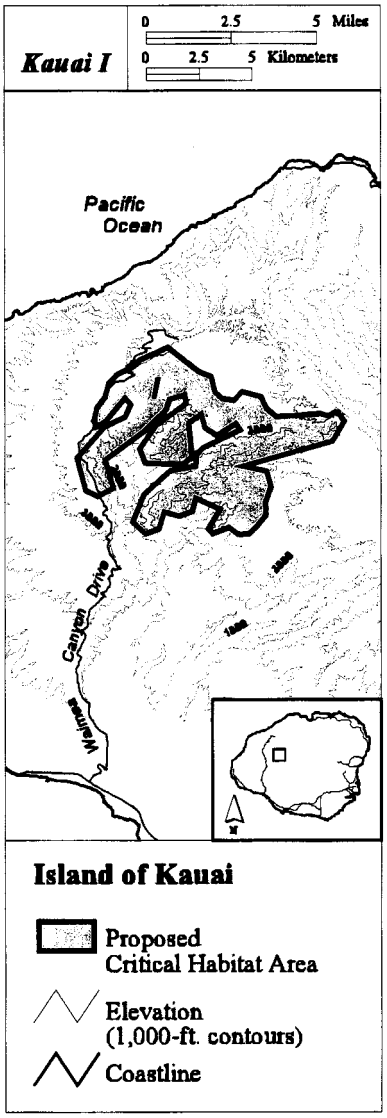
Note: Map follows:



Kauai I (5,111 ha; 12,629 ac)

Unit consists of seventy-five boundary points with the following coordinates: 442326, 2445855; 442681, 2445377; 442140, 2444430; 437912, 2443251; 439011, 2443004; 439226, 2442251; 438956, 2441522; 438983, 2440918; 438599, 2440452; 438182, 2440018; 437639, 2439989; 437237, 2440320; 436456, 2440043; 436254, 2440270; 436809, 2441177; 435666, 2441725; 435498, 2441102; 434893, 2440850; 434168, 2441070; 433936, 2440283; 433268, 2440018; 432676, 2440585; 433230, 2441908; 434465, 2443017; 435654, 2443235; 435682, 2443786; 435977, 2444109; 437779, 2444969; 437565, 2445246; 436658, 2444679; 436091, 2445059; 435939, 2445705; 435335, 2445271; 435492, 2443672; 435074, 2443340; 433280, 2443372; 433030, 2444063; 433773, 2445154; 435198, 2446208; 435150, 2446635; 434429, 2446408; 434277, 2445895; 433180, 2444874; 431397, 2443543; 431758, 2442201; 431027, 2441811; 430463, 2442072; 430035, 2443613; 431367, 2445115; 432329, 2445592; 432614, 2446180; 432320, 2446465; 431417, 2445364; 430956, 2445096; 430881, 2445501; 431001, 2446041; 431376, 2446520; 431571, 2447195; 431976, 2447600; 432606, 2447884; 433056, 2448274; 433716, 2448589; 434346, 2448873; 435795, 2447718; 436399, 2447492; 436567, 2446737; 436897, 2446435; 437473, 2446353; 437858, 2446764; 438755, 2446540; 439012, 2445981; 439481, 2445574; 440439, 2445635; 441564, 2445724; 441941, 2445618.

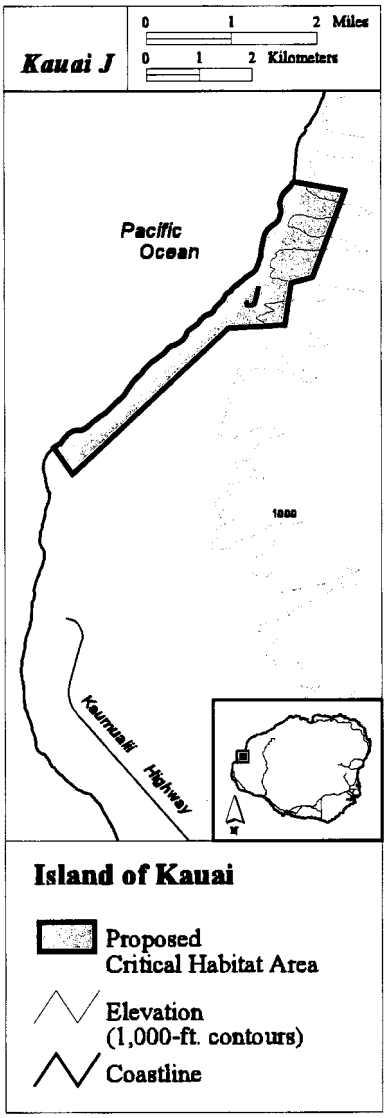
Note: Map follows:



Kauai J (504 ha; 1,245 ac)

Unit consists of eight boundary points and the intermediate coastline with the following coordinates: 423814, 2445432; 424802, 2445255; 424177, 2443625; 423776, 2443508; 423659, 2442716; 422590, 2442656; 419640, 2439894; 419295, 2440404.

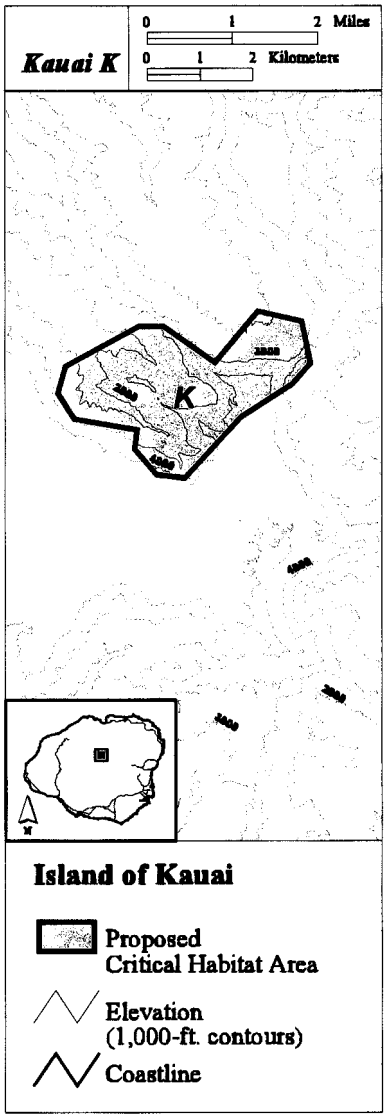
Note: Map follows:



Kauai K (821 ha; 2,028 ac)

Unit consists of fifteen boundary points with the following coordinates: 448086, 2443601; 447030, 2442449; 446492, 2442508; 446087, 2442992; 446126, 2443364; 444940, 2443559; 444633, 2444048; 444772, 2444564; 446167, 2445324; 446631, 2445322; 447605, 2444633; 448415, 2445609; 449238, 2445413; 449406, 2444618; 449057, 2444228.

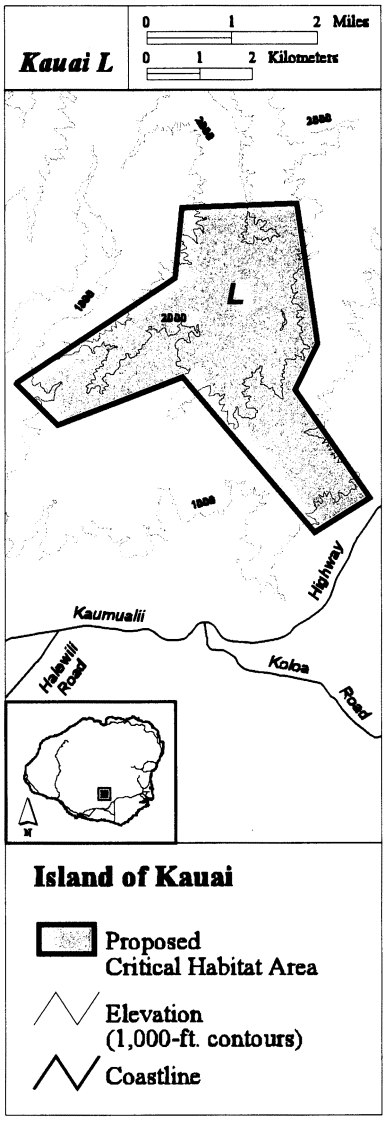
Note: Map follows:



Kauai L (1,682 ha; 4,157 ac)

Unit consists of eleven boundary points with the following coordinates: 443963, 2429307; 446972, 2431287; 447094, 2432620; 449275, 2432701; 449659, 2430034; 449235, 2429166; 450649, 2427126; 449602, 2426473; 447114, 2429408; 444745, 2428502; 443963, 2429287.

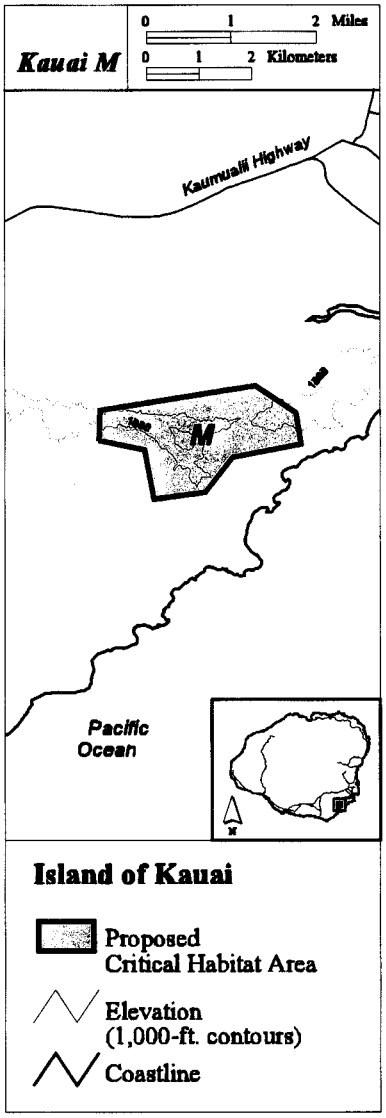
Note: Map follows:



Kauai M (482 ha; 1,191 ac)

Unit consists of nine boundary points with the following coordinates: 456911, 2424542; 456931, 2425122; 459885, 2425581; 460651, 2425063; 460751, 2424475; 459457, 2424224; 458932, 2423556; 457954, 2423431; 457777, 2424372.

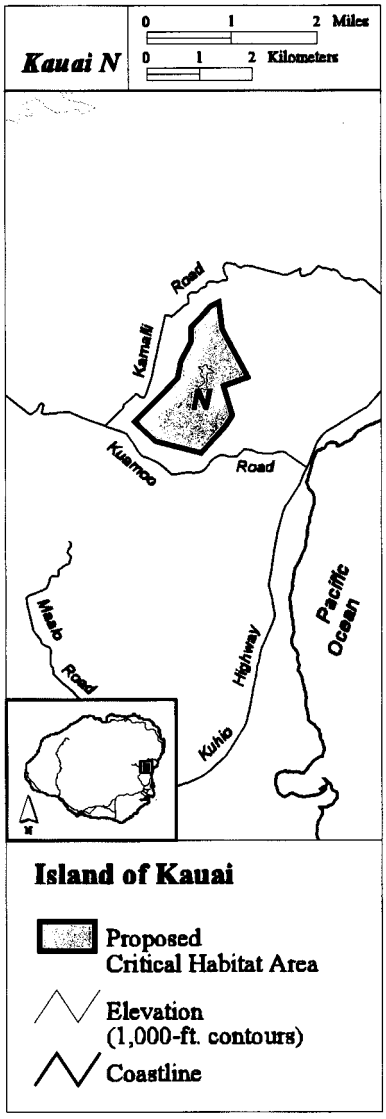
Note: Map follows:



Kauai N (286 ha; 707 ac)

Unit consists of sixteen boundary points with the following coordinates: 462502, 2438598; 462104, 2438973; 462578, 2439445; 462918, 2439799; 462987, 2440106; 463169, 2440475; 463176, 2440747; 463392, 2440968; 463540, 2441156; 463704, 2441235; 463768, 2440728; 464252, 2439811; 463789, 2439644; 463956, 2439085; 463831, 2438883; 463365, 2438375.

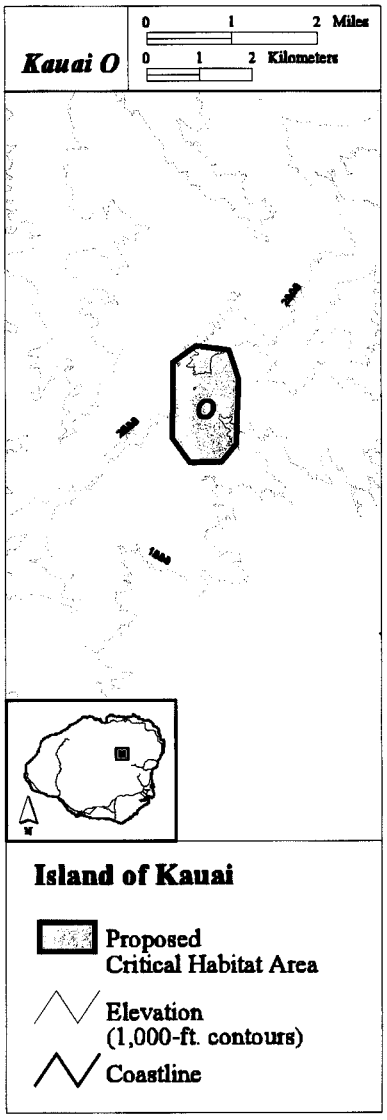
Note: Map follows:



Kauai O (243 ha; 600 ac)

Unit consists of eight boundary points with the following UTM coordinates: 454357, 2445398; 454986, 2445311; 455160, 2444765; 455113, 2443528; 454847, 2443199; 454234, 2443189; 453902, 2443647; 453926, 2445083.

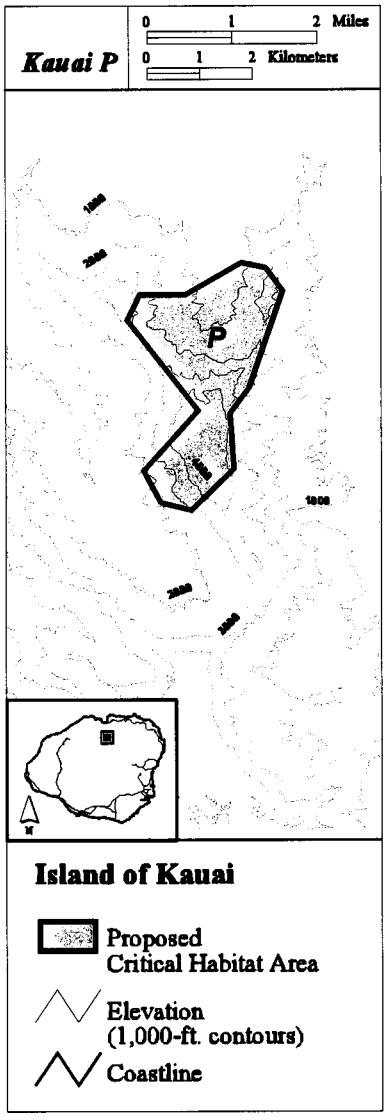
Note: Map follows:



Kauai P (711 ha; 1,758 ac)

Unit consists of thirteen boundary points with the following coordinates: 447753, 2447225; 447428, 2447829; 448470, 2448968; 447125, 2450677; 447365, 2451166; 448229, 2451166; 449288, 2451766; 449752, 2451666; 450073, 2451227; 449432, 2449395; 449073, 2448924; 449147, 2447868; 448339, 2447084.

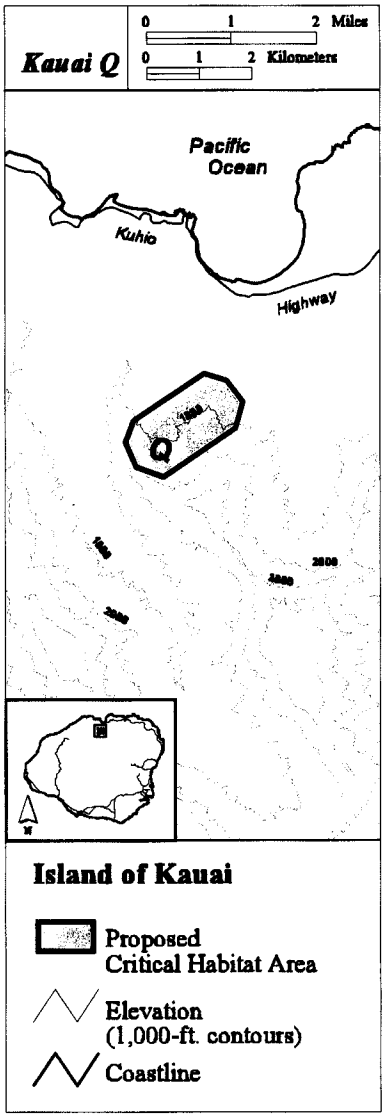
Note: Map follows:



Kauai Q (254 ha; 627 ac)

Unit consists of eight boundary points with the following coordinates: 445509, 2452732; 446856, 2453623; 447285, 2453489; 447596, 2453084; 447448, 2452593; 446079, 2451669; 445560, 2451860; 445359, 2452315.

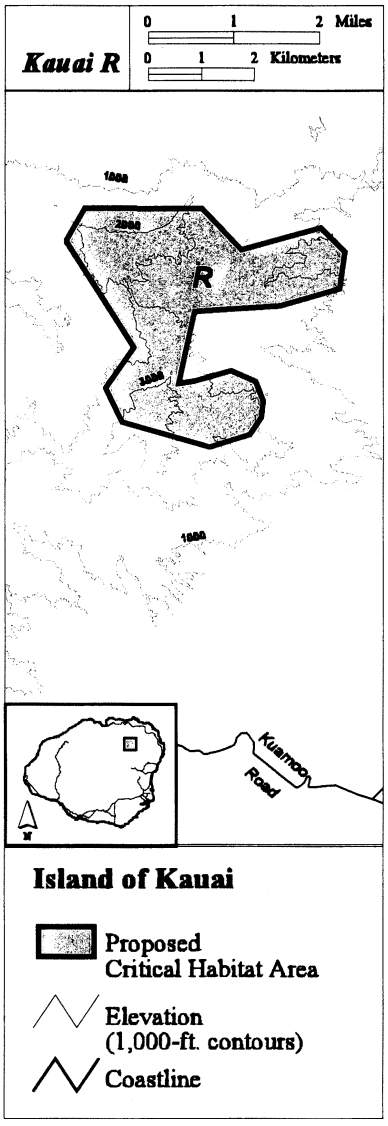
Note: Map follows:



Kauai R (1,216 ha; 3,004 ac)

Unit consists of twenty boundary points with the following coordinates: 455777, 2449394; 456131, 2450017; 458344, 2450005; 459083, 2449224; 460578, 2449637; 461026, 2449189; 460925, 2448495; 459811, 2448172; 458204, 2448066; 457900, 2446720; 458214, 2446760; 458887, 2446950; 459348, 2446748; 459490, 2446382; 459454, 2446075; 459242, 2445757; 458486, 2445521; 456838, 2445992; 456525, 2446628; 457057, 2447386.

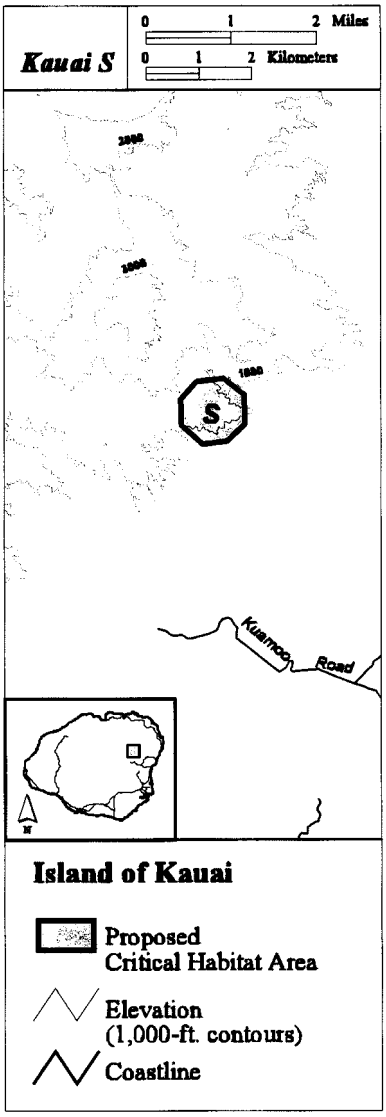
Note: Map follows:



Kauai S (119 ha; 294 ac)

Unit consists of eight boundary points with the following coordinates: 458569, 2444612; 459074, 2444680; 459466, 2444364; 459486, 2443810; 459152, 2443495; 458687, 2443427; 458285, 2443787; 458273, 2444282.

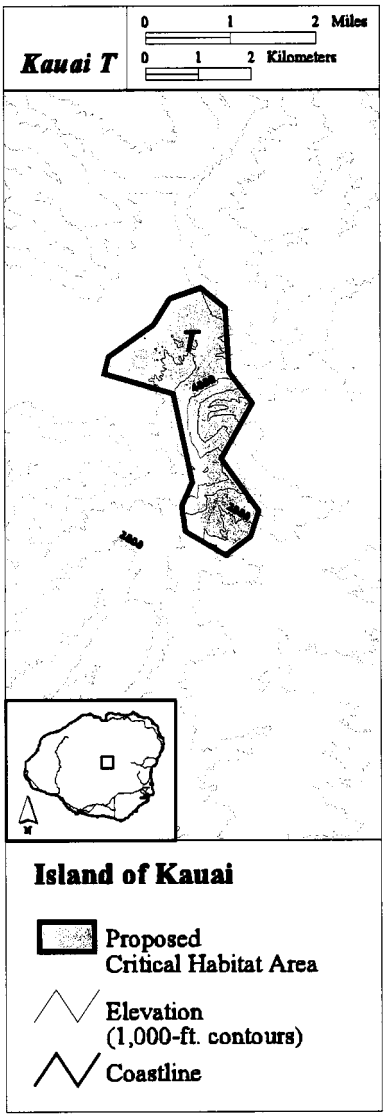
Note: Map follows:



Kauai T (639 ha; 1,578 ac)

Unit consists of sixteen boundary points with the following coordinates: 448552, 2442388; 449125, 2442584; 449589, 2442204; 449663, 2440988; 450101, 2440410; 449514, 2439343; 450217, 2438368; 450068, 2437872; 449597, 2437516; 448836, 2437971; 448762, 2438443; 448960, 2438905; 448605, 2440584; 447306, 2440964; 447381, 2441287; 448241, 2441890.

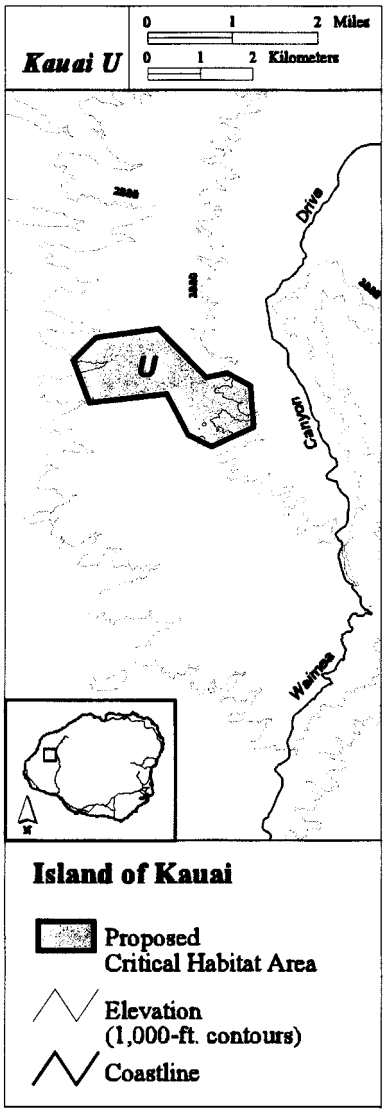
Note: Map follows:



Kauai U (392 ha; 969 ac)

Unit consists of eleven boundary points with the following coordinates: 426882, 2443616; 428076, 2443787; 428971, 2442855; 429381, 2442944; 429822, 2442698; 429881, 2441922; 429083, 2441549; 428635, 2441781; 428233, 2442549; 426763, 2442385; 426465, 2443191.

Note: Map follows:



PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT ON KAUAI

Kauai units	Species
A	*Cyrtandra limahuliensis.*
B	*Lipochaeta waimeaensis* and *Spermolepis hawaiiensis.*
C	*Schiedea spergulina* var. *leiopoda.*
D	*Solanum sandwicense.*
E	*Brighamia insignis.*
F	*Adenophorus periens, Cyrtandra limahuliensis, Delissea rhytidosperma, Flueggea neowawraea, Hesperomannia lydgatei, Hibiscus waimeae* ssp. *hannerae, Isodendrion longifolium, Labordia lydgatei, Lobelia niihauensis, Myrsine linearifolia, Peucedanum sandwicense,* and *Pteralyxia kauaiensis.*
G	*Adenophorus periens, Alectryon macrococcus, Alsinidendron lychnoides, Bonamia menziesii, Brighamia insignis, Centaurium sebaeoides, Chamaesyce halemanui, Cyperus trachysanthos, Delissea rhytidosperma, Delissea rivularis, Delissea undulata, Diellia pallida, Dubautia latifolia, Euphorbia haeleeleana, Exocarpos luteolus, Flueggea neowawraea, Gouania meyenii, Hedyotis cookiana, Hedyotis st.-johnii, Hibiscadelphus woodii, Isodendrion laurifolium, Isodendrion longifolium, Kokia kauaiensis, Lipochaeta fauriei, Lobelia niihauensis, Melicope haupuensis, Melicope knudsenii, Melicope pallida, Munroidendron racemosum, Myrsine linearifolia, Nothocestrum peltatum, Peucedanum sandwicense, Phyllostegia wawrana, Plantago princeps, Poa mannii, Poa sandvicensis, Poa siphonoglossa, Pteralyxia kauaiensis, Remya kauaiensis, Remya montgomeryi, Schiedea apokremnos, Schiedea kauaiensis, Schiedea membranacea, Schiedea spergulina* var. *spergulina, Solanum sandwicense, Stenogyne campanulata, Wilkesia hobdyi,* and *Xylosma crenatum.*
H	*Alsinidendron lychnoides, Exocarpos luteolus, Myrsine linearifolia,* and *Platanthera holochila.*
I	*Alectryon macrococcus, Alsinidendron viscosum, Chamaesyce halemanui, Diellia pallida, Dubautia latifolia, Euphorbia haeleeleana, Exocarpos luteolus, Flueggea neowawraea, Gouania meyenii, Isodendrion laurifolium, Kokia kauaiensis, Lipochaeta fauriei, Lipochaeta micrantha, Lobelia niihauensis, Melicope haupuensis, Melicope knudsenii, Melicope pallida, Munroidendron racemosum, Myrsine linearifolia, Nothocestrum peltatum, Peucedanum sandwicense, Phyllostegia knudsenii, Phyllostegia wawrana, Poa sandvicensis, Poa siphonoglossa, Pteralyxia kauaiensis, Remya kauaiensis, Remya montgomeryi, Schiedea helleri, Schiedea membranacea, Schiedea spergulina* var. *spergulina, Schiedea stellarioides, Solanum sandwicense, Spermolepis hawaiiensis, Xylosma crenatum,* and *Zanthoxylum hawaiiense.*
J	*Hedyotis st.-johnii, Lobelia niihauensis, Panicum niihauense, Schiedea apokremnos, Sesbania tomentosa,* and *Wilkesia hobdyi.*
K	*Adenophorus periens, Cyanea recta, Cyrtandra cyaneoides, Cyrtandra limahuliensis, Labordia lydgatei, Plantago princeps,* and *Schiedea membranacea.*
L	*Adenophorus periens, Bonamia menziesii, Cyanea remyi, Cyanea undulata, Cyrtandra limahuliensis, Dubautia pauciflorula, Exocarpos luteolus, Hesperomannia lydgatei, Isodendrion longifolium, Labordia lydgatei, Labordia tinifolia* var. *wahiawaensis, Myrsine linearifolia, Viola helenae,* and *Viola kauaiensis* var. *wahiawaensis.*
M	*Brighamia insignis, Delissea rhytidosperma, Isodendrion longifolium, Lipochaeta micrantha, Munroidendron racemosum, Peucedanum sandwicense, Pteralyxia kauaiensis,* and *Schiedea nuttallii.*
N	*Hibiscus clayi* and *Munroidendron racemosum.*
O	*Cyrtandra limahuliensis* and *Cyanea recta.*
P	*Adenophorus periens, Cyanea recta, Cyanea remyi, Cyrtandra cyaneoides, Cyrtandra limahuliensis, Hesperomannia lydgatei, Isodendrion longifolium, Labordia lydgatei, Myrsine linearifolia,* and *Plantago princeps.*
Q	*Cyrtandra limahuliensis* and *Pteralyxia kauaiensis.*
R	*Adenophorus periens, Cyanea asarifolia, Cyanea recta, Cyanea remyi, Cyrtandra cyaneoides, Cyrtandra limahuliensis, Labordia lydgatei, Phyllostegia wawrana.*
S	*Exocarpos luteolus.*
T	*Cyanea asarifolia, Cyanea remyi, Cyrtandra limahuliensis, Labordia lydgatei, Lysimachia filifolia, Plantago princeps,* and *Pteralyxia kauaiensis.*
U	*Alectryon macrococcus, Euphorbia haeleeleana, Isodendrion laurifolium, Lipochaeta fauriei, Poa siphonoglossa, Pteralyxia kauaiensis,* and *Remya kauaiensis.*

(B) Niihau.

Critical habitat units with multiple species are described below. Coordinates are in UTM Zone 4 with units in meters using North American Datum of 1983 (NAD83). Distances are provided in meters and miles.

Niihau A (94 ha; 232 ac)

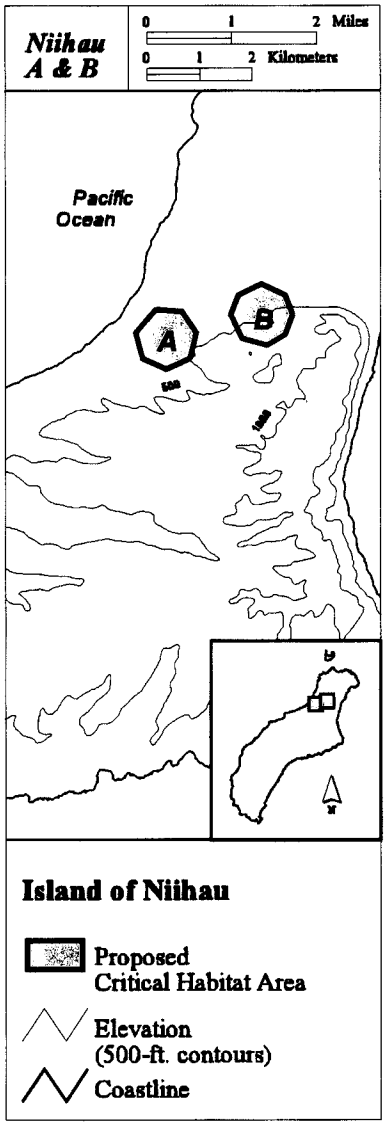
Area consists of seven boundary points with the following coordinates: 385256, 2427495; 384807, 2427285; 384358, 2427494; 384230, 2427972; 384607, 2428421; 385100, 2428379; 385384, 2427974.

Note: Map follows:

Niihau B (97 ha; 239 ac)

Area consists of eight boundary points with the following coordinates: 387204, 2428323; 387067, 2427946; 386719, 2427745; 386241, 2427873; 386032, 2428321; 386169, 2428698; 386618, 2428908; 387067, 2428699.

Note: Map follows:



PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT ON NIIHAU

Niihau units	Species
A	*Cyperus trachysanthos.*
B	*Brighamia insignis.*

(ii) Hawaiian plants—Constituent elements.

(A) Flowering plants.

Family Apiaceae: *Peucedanum sandwicense* (makou)

Kauai F, G, I, and M, identified in the legal descriptions in (a)(1)(i)(A), constitute critical habitat for *Peucedanum sandwicense* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) cliff habitats (a) in mixed shrub coastal dry cliff communities or diverse mesic forest and (b) containing one or more of the following associated native plant species: *Hibiscus kokio, Brighamia insignis, Bidens* sp., *Artemisia* sp., *Lobelia niihauensis, Wilkesia gymnoxiphium, Canthium odoratum, Dodonaea viscosa, Psychotria* sp., *Acacia koa, Kokio kauaiensis, Carex meyenii, Panicum lineale, Chamaesyce celastroides, Eragrostis* sp., *Diospyros* sp., or *Metrosideros polymorpha;* and (2) elevations from sea level to above 915 m (3,000 ft).

Family Apiaceae: *Spermolepis hawaiiensis* (no common name)

Kauai B and I, identified in the legal descriptions in (a)(1)(i)(A), constitute critical habitat for *Spermolepis hawaiiensis* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) *Metrosideros polymorpha* forests or *Dodonaea viscosa* lowland dry shrubland containing one or more of the following associated plant species: *Eragrostis variabilis, Bidens sandvicensis, Schiedea spergulina, Lipochaeta* sp., *Cenchrus agrimonioides, Sida fallax, Doryopteris* sp., or *Gouania hillebrandii*; and (2) elevations of about 305 to 610 m (1,000 to 2,000 ft).

Family Apocynaceae: *Pteralyxia kauaiensis* (kaulu)

Kauai F, G, I, M, Q, T, and U, identified in the legal descriptions in (a)(1)(i)(A), constitute critical habitat for *Pteralyxia kauaiensis* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) diverse mesic or wet forests containing one or more of the following associated plant taxa: *Pisonia sandwicensis, Euphorbia haeleeleana, Charpentiera elliptica, Pipturus* sp., *Neraudia kauaiensis, Hedyotis terminalis, Pritchardia* sp., *Gardenia remyi, Syzygium* sp., *Pleomele* sp., *Cyanea* sp., *Hibiscus* sp., *Kokia kauaiensis, Alectryon macrococcus, Canthium odoratum, Nestegis sandwicensis, Bobea timonioides, Rauvolfia sandwicensis, Nesoluma polynesicum, Myrsine lanaiensis, Caesalpinia kauaiensis, Tetraplasandra* sp., *Acacia koa, Styphelia tameiameiae, Dodonaea viscosa, Gahnia* sp., *Freycinetia arborea, Psychotria mariniana, Diplazium sandwichianum, Zanthoxylum dipetalum, Carex* sp., *Delissea* sp., *Xylosma hawaiiense, Alphitonia ponderosa, Santalum freycinetianum, Antidesma* sp., *Diospyros* sp., *Metrosideros polymorpha, Dianella sandwicensis, Poa sandwicensis, Schiedea*

stellarioides, Peperomia macraeana, Claoxylon sandwicense, or *Pouteria sandwicensis*; and (2) elevations between 250 to 610 m (820 to 2,000 ft).

Family Araliaceae: *Munroidendron racemosum* (no common name)

Kauai G, I, M, and N, identified in the legal descriptions in (a)(1)(i)(A), constitute critical habitat for *Munroidendron racemosum* on Kauai. Within these units the currently known primary constituent elements of critical habitat are habitat components that provide: (1) steep exposed cliffs or ridge slopes (a) in coastal or lowland mesic forest and (b) containing one or more of the following associated plant taxa: *Pisonia umbellifera, Canavalia galeata, Sida fallax, Brighamia insignis, Canthium odoratum, Psychotria* sp., *Nestegis sandwicensis, Tetraplasandra* sp., *Bobea timonioides, Rauvolfia sandwicensis, Pleomele* sp., *Pouteria sandwicensis,* or *Diospyros* sp.; and (2) elevations between 120 to 400 m (395 to 1,310 ft).

Family Asteraceae: *Dubautia latifolia* (na'ena'e)

Kauai G and I, identified in the legal descriptions in (a)(1)(i)(A), constitute critical habitat for *Dubautia latifolia* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) gentle or steep slopes on well drained soil in (a) semi-open or closed, diverse montane mesic forest dominated by *Acacia koa* and/or *Metrosideros polymorpha* and (b) containing one or more of the following native plant species: *Pouteria sandwicensis, Dodonaea viscosa, Nestegis sandwicensis, Diplazium sandwichianum, Elaeocarpus bifidus, Claoxylon sandwicense, Bobea* sp., *Pleomele* sp., *Antidesma* sp., *Cyrtandra* sp., *Xylosma* sp., *Alphitonia ponderosa, Coprosma waimeae, Dicranopteris linearis, Hedyotis terminalis, Ilex anomala, Melicope anisata, Psychotria mariniana,* or *Scaevola* sp.; and (2) elevations between 800 to 1,220 m (2,625 to 4,000 ft).

Family Asteraceae: *Dubautia pauciflorula* (na'ena'e)

Kauai L, identified in the legal description in (a)(1)(i)(A), description above, constitutes critical habitat for *Dubautia pauciflorula* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) lowland wet forest within stream drainages; and (2) elevations between 670–700 m (2,200–2,300 ft).

Family Asteraceae: *Hesperomannia lydgatei* (no common name)

Kauai F, L, and P, identified in the legal descriptions in (a)(1)(i)(A), constitute critical habitat for *Hesperomannia lydgatei* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) stream banks with rich brown soil and silty clay (a) in *Metrosideros polymorpha* or *Metrosideros polymorpha-Dicranopteris linearis* lowland wet forest and (b) containing one or more of the following associated native plant species: *Adenophorus* sp., *Antidesma* sp., *Broussaisia arguta, Cheirodendron* sp., *Elaphoglossum* sp., *Freycinetia arborea, Hedyotis terminalis, Labordia lydgatei, Machaerina angustifolia, Peperomia* sp., *Pritchardia* sp., *Psychotria hexandra,* and *Syzygium sandwicensis*; and (2) elevations between 410–915 m (1,345–3,000 ft).

Family Asteraceae: *Lipochaeta fauriei* (nehe)

Kauai G, I, and U, identified in the legal descriptions in (a)(1)(i)(A), constitute critical habitat for *Lipochaeta fauriei* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) moderate shade to full sun on the sides of steep gulches (a) in diverse lowland mesic forests and (b) containing one or more of the following native species: *Diospyros* sp., *Myrsine lanaiensis, Euphorbia haeleeleana, Acacia koa, Pleomele aurea, Sapindus oahuensis, Nestegis sandwicensis, Dodonaea viscosa, Psychotria mariniana, Psychotria greenwelliae, Kokia kauaiensis,* or *Hibiscus waimeae*; and (2) elevations between 480 and 900 m (1,575 and 2,950 ft).

Family Asteraceae: *Lipochaeta micrantha* (nehe)

Kauai I and M, identified in the legal descriptions in (a)(1)(i)(A), constitute critical habitat for *Lipochaeta micrantha* on Kauai. Within these units the currently known primary constituent elements of critical habitat for *Lipochaeta micrantha* var. *exigua* are habitat components that provide: (1) cliffs, ridges, or slopes (a) in grassy, shrubby or dry mixed communities and (b) containing one or more of the following associated native plant species: *Artemisia australis, Bidens sandvicensis, Plectranthus parviflorus, Chamaesyce celastroides, Diospyros* sp., *Canthium odoratum, Neraudia* sp., *Pipturus* sp., *Hibiscus kokio, Sida fallax, Eragrostis* sp., or *Lepidium bidentatum*; and (2) elevations between 305–430 m (1,000–1,400 ft).

Within these units, the currently known primary constituent elements of critical habitat for *Lipochaeta micrantha* var. *micrantha* are habitat components that provide: (1) basalt cliffs, stream banks, or level ground (a) in mesic or diverse *Metrosideros polymorpha-Diospyros* sp. forest and (b) containing one or more of the following associated native plant species: *Lobelia niihauensis, Chamaesyce celastroides* var. *hanapepensis, Neraudia kauaiensis, Rumex* sp., *Nontrichium* sp. (kului), *Artemisia* sp., *Dodonaea viscosa, Antidesma* sp., *Hibiscus* sp., *Xylosma* sp., *Pleomele* sp., *Melicope* sp., *Bobea* sp., and *Acacia koa*; and (2) elevations between 610–720 m (2,000–2,360 ft).

Family Asteraceae: *Lipochaeta waimeaensis* (nehe)

Kauai B, identified in the legal description in (a)(1)(i)(A), constitutes critical habitat for *Lipochaeta waimeaensis* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) precipitous, shrub-covered gulch (a) in diverse lowland forest and (b) containing the native species *Dodonaea viscosa* or *Lipochaeta connata*; and (2) elevations between 350 and 400 m (1,150 and 1,310 ft).

Family Asteraceae: *Remya kauaiensis* (no common name)

Kauai G, I, and U, identified in the legal descriptions in (a)(1)(i)(A), constitute critical habitat for *Remya kauaiensis* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) steep, north or northeast facing slopes (a) in *Acacia koa-Metrosideros polymorpha* lowland mesic forest and (b) containing one or more of the following associated native plant species: *Chamaesyce* sp., *Nestegis sandwicensis, Diospyros* sp., *Hedyotis terminalis, Melicope* ssp., *Pouteria sandwicensis, Schiedea membranacea, Psychotria mariniana, Dodonaea viscosa, Dianella sandwicensis, Tetraplasandra kauaiensis,* or *Claoxylon sandwicensis*; and (2) elevations between 850 to 1,250 m (2,800 to 4,100 ft).

Family Asteraceae: *Remya montgomeryi* (no common name)

Kauai G and I, identified in the legal descriptions in (a)(1)(i)(A), constitute critical habitat for *Remya montgomeryi* on Kauai. Within these units, the

currently known primary constituent elements of critical habitat are habitat components that provide: (1) steep, north or northeast-facing slopes, cliffs, or stream banks near waterfalls (a) in *Metrosideros polymorpha* mixed mesic forest and (b) containing one or more of the following associated native plant species: *Lysimachia glutinosa, Lepidium serra, Boehmeria grandis, Poa mannii, Stenogyne campanulata, Myrsine linearifolia, Bobea timonioides, Ilex anomala, Zanthoxylum dipetalum, Claoxylon sandwicensis, Tetraplasandra* spp., *Artemisia* sp., *Nototrichium* sp., *Cyrtandra* sp., *Dubautia plantaginea, Sadleria* sp., *Cheirodendron* sp., *Scaevola* sp., or *Pleomele* sp.; and (2) elevations between 850 to 1,250 m (2,800 to 4,100 ft).

Family Asteraceae: *Wilkesia hobdyi* (dwarf iliau)

Kauai G and J, identified in the legal descriptions in (a)(1)(i)(A), constitute critical habitat for *Wilkesia hobdyi* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) coastal dry cliffs or very dry ridges containing one or more of the following associated native plant species: *Artemisia* sp., *Wilkesia gymnoxiphium, Lipochaeta connata, Lobelia niihauensis, Peucedanum sandwicensis, Hibiscus kokio* ssp. *saint johnianus, Canthium odoratum, Peperomia* sp., *Myoporum sandwicense, Sida fallax, Waltheria indica, Dodonaea viscosa,* or *Eragrostis variabilis*; and (2) elevations between 275 to 400 m (900 to 1,310 ft).

Family Campanulaceae: *Brighamia insignis* (‘olulu)

Kauai E, G, and M, identified in the legal descriptions in (a)(1)(i)(A), and Niihau B, identified in the legal descriptions in (a)(1)(i)(B), constitute critical habitat for *Brighamia insignis* on Kauai and Niihau. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) rocky ledges with little soil or steep sea cliffs (a) in lowland dry grasslands or shrublands with annual rainfall that is usually less than 170 cm (65 in.) and (b) containing one or more of the following native plant species: *Artemisia* sp., *Chamaesyce celastroides, Canthium odoratum, Eragrostis variabilis, Heteropogon contortus, Hibiscus kokio, Hibiscus saintjohnianus, Lepidium serra, Lipochaeta succulenta, Munroidendron racemosum,* or *Sida fallax*; and (2) elevations between sea level to 480 m (1,575 ft) elevation.

Family Campanulaceae: *Cyanea asarifolia* (haha)

Kauai R and T, identified in the legal descriptions in (a)(1)(i)(A), constitute critical habitat for *Cyanea asarifolia* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) pockets of soil on sheer rock cliffs (a) in lowland wet forests and (b) containing one or more of the following native plant species: *Hedyotis elatior, Machaerina angustifolia, Metrosideros polymorpha, Touchardia latifolia,* or *Urera glabra*; and (2) elevations between 330 to 730 m (1,080 to 2,400 ft).

Family Campanulaceae: *Cyanea recta* (haha)

Kauai K, O, P, and R, identified in the legal descriptions in (a)(1)(i)(A), constitute critical habitat for *Cyanea recta* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) gulches or slopes (a) in lowland wet or mesic *Metrosideros polymorpha* forest or shrubland and (b) containing one or more of the following native plant species: *Dicranopteris linearis, Psychotria* sp., *Antidesma* sp., *Cheirodendron platyphyllum, Cibotium* sp., or *Diplazium* sp.; and (2) elevations between 400 to 1,200 m (1,310 to 3,940 ft).

Family Campanulaceae: *Cyanea remyi* (haha)

Kauai L, P, R, and T, identified in the legal descriptions in (a)(1)(i)(A), constitute critical habitat for *Cyanea remyi* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) lowland wet forest or shrubland and containing one or more of the following native plant species: *Antidesma* sp., *Cheirodendron* sp., *Diospyros sp., Broussaisia arguta, Metrosideros polymorpha, Freycinetia arborea, Hedyotis terminalis, Machaerina angustifolia, Perrottetia sandwicensis, Psychotria hexandra,* or *Syzygium sandwicensis*; and (2) elevations between 360 to 930 m (1,180 to 3,060 ft).

Family Campanulaceae: *Cyanea undulata* (haha)

Kauai L, identified in the legal descriptions in (a)(1)(i)(A), constitutes critical habitat for *Cyanea undulata* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) pristine, undisturbed sites along shady stream banks or steep to vertical slopes; and (2) elevations between 630 to 800 m (2,070 to 2,625 ft).

Family Campanulaceae: *Delissea rhytidosperma* (no common name)

Kauai F, G, and M, identified in the legal descriptions in (a)(1)(i)(A), constitute critical habitat for *Delissea rhytidosperma* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) well-drained soils with medium or fine-textured subsoil (a) in diverse lowland mesic forests or *Acacia koa* dominated lowland dry forests and (b) containing one or more of the following native species: *Euphorbia haeleeleana, Psychotria hobdyi, Pisonia* sp., *Pteralyxia* sp., *Dodonaea viscosa, Cyanea* sp., *Hedyotis* sp., *Dianella sandwicensis, Diospyros sandwicensis, Styphelia tameiameiae,* or *Nestegis sandwicensis;* and (2) elevations between 120 and 915 m (400 and 3,000 ft).

Family Campanulaceae: Delissea rivularis (‘oha)

Kauai G, identified in the legal description in (a)(1)(i)(A), constitutes critical habitat for *Delissea rivularis* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) steep slopes near streams (a) in *Metrosideros polymorpha—Cheirodendron trigynum* montane wet or mesic forest and (b) containing one or more of the following native plant species: *Broussaisia arguta, Carex* sp., *Coprosma* sp., *Melicope clusiifolia, M. anisata, Psychotria hexandra, Dubautia knudsenii, Diplazium sandwichianum, Hedyotis foggiana, Ilex anomala,* or *Sadleria* sp.; and (2) elevations between 1,100 to 1,220 m (3,610 to 4,000 ft).

Family Campanulaceae: *Delissea undulata* (no common name)

Kauai G, identified in the legal description in (a)(1)(i)(A), constitutes critical habitat for *Delissea undulata* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) dry or mesic open *Sophora chrysophylla-Metrosideros polymorpha* forests containing one or more of the following native plant species: *Diospyros sandwicensis, Dodonaea viscosa, Psychotria mariniana, P. greenwelliae, Santalum ellipticum, Nothocestrum breviflorum,* or *Acacia koa;* and (2) elevations between 610–1,740 m (2,000–5,700 ft).

Family Campanulaceae: *Lobelia niihauensis* (no common name)

Kauai F, G, I, and J, identified in the legal descriptions in (a)(1)(i)(A), constitute critical habitat for *Lobelia niihauensis* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) exposed mesic mixed shrubland or coastal dry cliffs containing one or more of the following associated native plant species: *Eragrostis* sp., *Bidens* sp., *Plectranthus parviflorus, Lipochaeta* sp., *Lythrum* sp., *Wilkesia hobdyi, Hibiscus kokio* ssp. *saint johnianus, Nototrichium* sp., *Schiedea apokremnos, Chamaesyce celastroides, Charpentiera* sp., or *Artemisia* sp.; and (2) elevations between 100 to 830 m (330 to 2720 ft).

Family Caryophyllaceae: *Alsinidendron lychnoides* (kuawawaenohu)

Kauai G and H, identified in the legal descriptions in (a)(1)(i)(A), constitute critical habitat for *Alsinidendron lychnoides* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) montane wet forests (a) dominated by *Metrosideros polymorpha* and *Cheirodendron* sp., or by *Metrosideros polymorpha* and *Dicranopteris linearis* and (b) containing one or more of the following native plant species: *Carex* sp., *Cyrtandra* sp., *Machaerina* sp., *Vaccinium* sp., *Peperomia* sp., *Hedyotis terminalis, Astelia* sp., or *Broussaisia arguta;* and (2) elevations between 1,100 and 1,320 m (3,610 and 4,330 ft).

Family Caryophyllaceae: *Alsinidendron viscosum* (no common name)

Kauai I, identified in the legal description in (a)(1)(i)(A), constitutes critical habitat for *Alsinidendron viscosum* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) steep slopes (a) in *Acacia koa-Metrosideros polymorpha* lowland, montane mesic, or wet forest and (b) containing one or more of the following native plant species: *Alyxia olivaeformis, Bidens cosmoides, Bobea* sp., *Carex* sp., *Coprosma* sp., *Dodonaea viscosa, Gahnia* sp., *Ilex anomala, Melicope* sp., *Pleomele* sp., *Psychotria* sp., or *Schiedea stellarioides;* and (2) elevations between 820 and 1,200 m (2,700 and 3,940 ft).

Family Caryophyllaceae: *Schiedea apokremnos* (ma'oli'oli)

Kauai G and J, identified in the legal descriptions in (a)(1)(i)(A), constitute critical habitat for *Schiedea apokremnos* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) crevices of near-vertical coastal cliff faces (a) in sparse dry coastal shrub vegetation and (b) containing one or more of the following associated native plant species: *Heliotropium* sp., *Chamaesyce* sp., *Bidens* sp., *Artemisia australis, Lobelia niihauensis, Wilkesia hobdyi, Lipochaeta connata, Myoporum sandwicense, Canthium odoratum,* or *Peperomia* sp.; and (2) elevations between 60 to 330 m (200 to 1,080 ft).

Family Caryophyllaceae: *Schiedea helleri* (no common name)

Kauai I, identified in the legal description in (a)(1)(i)(A), constitutes critical habitat for *Schiedea helleri* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) ridges and steep cliffs (a) in closed *Metrosideros polymorpha-Dicranopteris linearis* montane wet forest, or *Metrosideros polymorpha-Cheirodendron* sp. montane wet forest, or *Acacia koa-Metrosideros polymorpha* montane mesic forest, and (b) containing one or more of the following associated native plant species: *Dubautia raillardioides, Scaevola procera, Hedyotis terminalis, Syzygium sandwicensis, Melicope clusifolia, Cibotium* sp., *Broussaisia arguta, Cheirodendron sp., Cyanea hirtella, Dianella sandwicensis, Viola wailenalenae,* or *Poa sandvicensis;* and (2) elevations between 1,065–1,100 m (3,490–3,610 ft).

Family Caryophyllaceae: *Schiedea kauaiensis* (no common name)

Kauai G, identified in the legal description in (a)(1)(i)(A), constitutes critical habitat for *Schiedea kauaiensis* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) steep slopes (a) in diverse mesic or wet forest and (b) containing one or more of the following associated plant taxa: *Psychotria mariniana, Psychotria hexandra, Canthium odoratum, Pisonia* sp., *Microlepia speluncae, Exocarpos luteolus, Diospyros* sp., *Peucedanum sandwicense,* or *Euphorbia haeleeleana;* and (2) elevations between 680–790 m (2,230–2,590 ft).

Family Caryophyllaceae: *Schiedea membranacea* (no common name)

Kauai G, I, and K, identified in the legal descriptions in (a)(1)(i)(A), constitute critical habitat for *Schiedea membranacea* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) cliffs or cliff bases (a) in mesic or wet habitats, (b) in lowland, or montane shrubland, or forest communities dominated by *Acacia koa, Pipturus* sp. or *Metrosideros polymorpha* and (c) containing one or more of the following associated native plant species: *Hedyotis terminalis, Melicope* sp., *Pouteria sandwicensis, Poa mannii, Hibiscus waimeae, Psychotria mariniana, Canthium odoratum, Pisonia* sp., *Perrottetia sandwicensis, Scaevola procera, Sadleria cyatheoides, Diplazium sandwicensis, Thelypteris sandwicensis, Boehmeria grandis, Dodonaea viscosa, Myrsine* sp., *Bobea brevipes, Alyxia olivaeformis, Psychotria greenwelliae, Pleomele* sp., *Alphitonia ponderosa, Joinvillea ascendens* ssp. *ascendens, Athyrium sandwichianum, Machaerina angustifolia, Cyrtandra paludosa, Touchardia latifolia, Thelypteris cyatheoides, Lepidium serra, Eragrostis variabilis, Remya kauaiensis, Lysimachia kalalauensis, Labordia helleri, Mariscus pennatiformis, Asplenium praemorsum,* or *Poa sandvicensis;* and (2) elevations between 520 and 1,160 m (1,700 and 3,800 ft).

Family Caryophyllaceae: *Schiedea nuttallii* (no common name)

Kauai M, identified in the legal description in (a)(1)(i)(A), constitutes critical habitat for *Schiedea nuttallii* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) diverse lowland mesic forest, often with *Metrosideros polymorpha* dominant, containing one or more of the following associated native plant species: *Antidesma* sp, *Psychotria* sp., *Perrottetia sandwicensis, Pisonia* sp., or *Hedyotis acuminata;* and (2) elevations between 415 and 790 m (1,360 and 2,590 ft).

Family Caryophyllaceae: *Schiedea spergulina* var. *leiopoda* (no common name)

Kauai C, identified in the legal description in (a)(1)(i)(A), constitutes critical habitat for *Schiedea spergulina* var. *leiopoda* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) bare rock outcrops or sparsely vegetated portions of rocky cliff faces or cliff bases (a) in diverse lowland mesic forests and (b) containing one or more of the following native plants: *Bidens sandvicensis, Doryopteris* sp., *Peperomia leptostachya,* or *Plectranthus parviflorus;* and (2) elevations between 180 and 800 m (590 and 2,625 ft).

Family Caryophyllaceae: *Schiedea spergulina* var. *spergulina* (no common name)

Kauai G and I, identified in the legal descriptions in (a)(1)(i)(A), constitute critical habitat for *Schiedea spergulina* var. *spergulina* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) bare rock outcrops or sparsely vegetated portions of rocky cliff faces or cliff bases (a) in diverse lowland mesic forests and (b) containing one or more of the following associated plant taxa: *Heliotropium* sp., or *Nototrichium sandwicense;* and (2) elevations between 180 and 800 m (590 and 2,625 ft).

Family Caryophyllaceae: *Schiedea stellarioides* (laulihilihi (ma'oli'oli))

Kauai I, identified in the legal description in (a)(1)(i)(A), constitutes critical habitat for *Schiedea stellarioides* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) steep slopes (a) in closed *Acacia koa-Metrosideros polymorpha* lowland or montane mesic forest or shrubland and (b) containing one or more of the following native plant species: *Nototrichium* sp., *Artemisia* sp., *Dodonaea viscosa, Melicope* sp., *Dianella sandwicensis, Bidens cosmoides, Mariscus* sp., or *Styphelia tameiameiae;* and (2) elevations between 610 and 1,120 m (2,000 and 3,680 ft).

Family Convolvulaceae: *Bonamia menziesii* (no common name)

Kauai G and L, identified in the legal descriptions in (a)(1)(i)(A), constitute critical habitat for *Bonamia menziesii* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) dry, mesic or wet forests containing one or more of the following native plant species: *Metrosideros polymorpha, Canthium odoratum, Dianella sandwicensis, Diospyros sandwicensis, Dodonaea viscosa, Hedyotis terminalis, Melicope anisata, Melicope barbigera, Myoporum sandwicense, Nestegis sandwicense, Pisonia* sp., *Pittosporum* sp., *Pouteria sandwicensis,* or *Sapindus oahuensis;* and (2) elevations between 150 and 850 m (500 and 2,800 ft).

Family Cyperaceae: *Cyperus trachysanthos* (pu'uka'a)

Kauai G, identified in the legal descriptions in (a)(1)(i)(A), and Niihau A, identified in the legal descriptions in (a)(1)(i)(B), constitute critical habitat for *Cyperus trachysanthos* on Kauai and Niihau. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) wet sites (mud flats, wet clay soil, or wet cliff seeps) (a) on coastal cliffs or talus slopes and (b) containing the native plant species *Hibiscus tiliaceus;* and (2) elevations between 3 and 160 m (10 and 525 ft).

Family Euphorbiaceae: *Chamaesyce halemanui* (no common name)

Kauai G and I, identified in the legal descriptions in (a)(1)(i)(A), constitute critical habitat for *Chamaesyce halemanui* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) steep slopes of gulches (a) in mesic *Acacia koa* forests and (b) containing one or more of the following native plant species: *Metrosideros polymorpha, Alphitonia ponderosa, Antidesma platyphyllum, Bobea brevipes, Cheirodendron trigynum, Coprosma* sp., *Diospyros sandwicensis, Dodonaea viscosa, Elaeocarpus bifidus, Hedyotis terminalis, Kokia kauaiensis, Melicope haupuensis, Pisonia* sp., *Pittosporum* sp., *Pleomele aurea, Psychotria mariniana, Psychotria greenwelliae, Pouteria sandwicensis, Santalum freycinetianum,* or *Styphelia tameiameiae;* and (2) elevations between 660 to 1,100 m (2,165 to 3,610 ft).

Family Euphorbiaceae: *Euphorbia haeleeleana* ('akoko)

Kauai G, I, and U, identified in the legal descriptions in (a)(1)(i)(A), constitute critical habitat for *Euphorbia haeleeleana* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) lowland mixed mesic or dry forest that (a) is often dominated by *Metrosideros polymorpha, Acacia koa,* or *Diospyros* sp. and (b) containing one or more of the following native plant species: *Acacia koaia, Antidesma platyphyllum, Claoxylon sp., Carex meyenii, Carex wahuensis, Diplazium sandwichianum, Dodonaea viscosa, Erythrina sandwicensis, Kokia kauaiensis, Pleomele aurea, Psychotria mariniana, P. greenwelliae, Pteralyxia sandwicensis, Rauvolfia sandwicensis, Reynoldsia sandwicensis, Sapindus oahuensis, Tetraplasandra kauaiensis, Pouteria sandwicensis, Pisonia sandwicensis,* or *Xylosma* sp.; and (2) elevations between 205 and 670 m (680 and 2,200 ft).

Family Euphorbiaceae: *Flueggea neowawraea* (mehamehame)

Kauai F, G, and I, identified in the legal descriptions in (a)(1)(i)(A), constitute critical habitat for *Flueggea neowawraea* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) dry or mesic forests containing one or more of the following native plant species: *Alectryon macrococcus, Bobea timonioides, Charpentiera* sp., *Caesalpinia kauaiense, Hibiscus* sp., *Melicope* sp., *Metrosideros polymorpha, Myrsine lanaiensis, Munroidendron racemosum, Tetraplasandra* sp., *Kokia kauaiensis, Isodendrion* sp., *Pteralyxia kauaiensis, Psychotria mariniana, Diplazium sandwichianum, Freycinetia arborea, Nesoluma polynesicum, Diospyros* sp., *Antidesma pulvinatum, A. platyphyllum, Canthium odoratum, Nestegis sandwicensis, Rauvolfia sandwicensis, Pittosporum* sp., *Tetraplasandra* sp., *Pouteria sandwicensis, Xylosma* sp., *Pritchardia* sp., *Bidens* sp., or *Streblus pendulinus;* and (2) elevations of 250 to 1,000 m (820 to 3,280 ft).

Family Fabaceae: *Sesbania tomentosa* ('ohai)

Kauai J, identified in the legal description in (a)(1)(i)(A), constitutes critical habitat for *Sesbania tomentosa* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) sandy beaches, dunes, soil pockets on lava, or pond margins (a) in coastal dry shrublands, or open *Metrosideros polymorpha* forests, or mixed coastal dry cliffs, and (b) containing one or more of the following associated native plant species: *Sida fallax, Heteropogon contortus, Myoporum sandwicense, Sporobolus virginicus, Scaevola sericea,* or *Dodonaea viscosa;* and (2) elevations between sea level and 12 m (0 and 40 ft).

Family Flacourtiaceae: *Xylosma crenatum* (no common name)

Kauai G and I, identified in the legal descriptions in (a)(1)(i)(A), constitute critical habitat for *Xylosma crenatum* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) diverse *Acacia koa-Metrosideros polymorpha* montane mesic forest, or *Metrosideros polymorpha-Dicranopteris linearis* montane wet forest, or *Acacia koa-Metrosideros polymorpha* montane wet forest, and containing one or more of the following associated native plant species: *Tetraplasandra kauaiensis, Hedyotis terminalis, Pleomele aurea, Ilex anomala, Claoxylon sandwicense,*

Myrsine alyxifolia, Nestegis sandwicensis, Streblus pendulinus, Psychotria sp., *Diplazium sandwichianum, Pouteria sandwicensis, Scaevola procera, Coprosma* sp., *Athyrium sandwichianum, Touchardia latifolia, Dubautia knudsenii, Cheirodendron* sp., *Lobelia yuccoides, Cyanea hirta, Poa sandwicensis,* or *Diplazium sandwichianum;* and (2) elevations between 975 to 1,065 m (3,200 to 3,4900 ft).

Family Gentianaceae: *Centaurium sebaeoides* (‘awiwi)

Kauai G, identified in the legal description in (a)(1)(i)(A), constitutes critical habitat for *Centaurium sebaeoides* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) volcanic or clay soils or cliffs (a) in arid coastal areas and (b) containing one or more of the following native plant species; *Artemisia* sp., *Bidens* sp., *Chamaesyce celastroides, Dodonaea viscosa, Fimbristylis cymosa, Heteropogon contortus, Jaquemontia ovalifolia, Lipochaeta succulenta, Lipochaeta heterophylla, Lipochaeta integrifolia, Lycium sandwicense, Lysimachia mauritiana, Mariscus phloides, Panicum fauriei, P. torridum, Scaevola sericea, Schiedea globosa, Sida fallax,* or *Wikstroemia uva-ursi;* and (2) elevations above 250 m (800 ft).

Family Gesneriaceae: *Cyrtandra cyaneoides* (mapele)

Kauai K, P, and R, identified in the legal descriptions in (a)(1)(i)(A), constitute critical habitat for *Cyrtandra cyaneoides* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) steep slopes or cliffs near streams or waterfalls (a) in lowland or montane wet forest or shrubland dominated by *Metrosideros polymorpha* or a mixture of *Metrosideros polymorpha* and *Dicranopteris linearis* and (b) containing one or more of the following native species: *Perrottetia sandwicensis, Pipturus* sp., *Bidens* sp., *Psychotria* sp., *Pritchardia* sp., *Freycinetia arborea, Cyanea* sp., *Cyrtandra limahuliensis, Diplazium sandwichianum, Gunnera* sp., *Coprosma* sp., *Stenogyne* sp., *Machaerina* sp., *Boehmeria grandis, Pipturus* sp., *Cheirodendron* sp., *Hedyotis terminalis,* or *Hedyotis tryblium;* and (2) elevations between 550 and 1,220 meter (1,800 and 4,000 ft).

Family Gesneriaceae: *Cyrtandra limahuliensis* (ha‘iwale)

Kauai A, F, K, L, O, P, Q, R, and T, identified in the legal descriptions in (a)(1)(i)(A), constitute critical habitat for *Cyrtandra limahuliensis* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) stream banks (a) in lowland wet forests and (b) containing one or more of the following native plant species: *Antidesma* sp., *Cyrtandra kealiea, Pisonia* sp., *Pipturus* sp., *Cibotium glaucum, Eugenia* sp, *Hedyotis terminalis, Dubautia* sp., *Boehmeria grandis, Touchardia latifolia, Bidens* sp., *Hibiscus waimeae, Charpentiera* sp., *Urera glabra, Pritchardia* sp., *Cyanea* sp., *Perrottetia sandwicensis, Metrosideros polymorpha, Dicranopteris linearis, Gunnera kauaiensis,* or *Psychotria* sp.; and (2) elevations between 245 and 915 m (800 and 3,000 ft).

Family Lamiaceae: *Phyllostegia knudsenii* (no common name)

Kauai I, identified in the legal description in (a)(1)(i)(A), constitutes critical habitat for *Phyllostegia knudsenii* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) *Metrosideros polymorpha* lowland mesic or wet forest containing one or more of the following associated native plant species: *Perrottetia sandwicensis, Cyrtandra kauaiensis, Cyrtandra paludosa, Elaeocarpus bifidus, Claoxylon sandwicensis, Cryptocarya mannii, Ilex anomala, Myrsine linearifolia, Bobea timonioides, Selaginella arbuscula, Diospyros* sp., *Zanthoxylum dipetalum, Pittosporum* sp., *Tetraplasandra* spp., *Pouteria sandwicensis,* or *Pritchardia minor;* and (2) elevations between 865–975 m (2,840–3,200 ft).

Family Lamiaceae: *Phyllostegia wawrana* (no common name)

Kauai G, I, and R, identified in the legal descriptions in (a)(1)(i)(A), constitute critical habitat for *Phyllostegia wawrana* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) *Metrosideros polymorpha* dominated lowland or montane wet or mesic forest with (a) *Cheirodendron* sp. or *Dicranopteris linearis* as co-dominants, and (b) containing one or more of the following associated native plant species: *Delissea rivularis, Diplazium sandwichianum, Vaccinium* sp., *Broussaisia arguta, Myrsine lanaiensis, Psychotria* sp., *Dubautia knudsenii, Scaevola procera, Gunnera* sp., *Pleomele aurea, Claoxylon sandwicense, Elaphoglossum* sp., *Hedyotis* sp., *Sadleria* sp., and *Syzygium sandwicensis;* and (2) elevations between 780–1,210 m (2,560–3,920 ft).

Family Lamiaceae: *Stenogyne campanulata* (no common name)

Kauai G, identified in the legal description in (a)(1)(i)(A), constitutes critical habitat for *Stenogyne campanulata* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) rock faces of nearly vertical, north-facing cliffs (a) in diverse lowland or montane mesic forest and (b) containing one or more of the following associated native plant species: *Heliotropium* sp., *Lepidium serra, Lysimachia glutinosa, Perrottetia sandwicensis, or Remya montgomeryi;* and (2) an elevation of 1,085 m (3,560 ft).

Family Loganiaceae: *Labordia lydgatei* (kamakahala)

Kauai F, K, L, P, R, and T, identified in the legal descriptions in (a)(1)(i)(A), constitute critical habitat for *Labordia lydgatei* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) *Metrosideros polymorpha-Dicranopteris linearis* lowland wet forest containing one or more of the following associated native plant species: *Psychotria* sp., *Hedyotis terminalis* sp., *Cyanea* sp., *Cyrtandra* sp., *Labordia hirtella, Antidesma platyphyllum* var. *hillebrandii, Syzygium sandwicensis, Ilex anomala,* or *Dubautia knudsenii;* and (2) elevations between 635 and 855 m (2,080 to 2,800 ft).

Family Loganiaceae: *Labordia tinifolia* var. *wahiawaensis* (kamakahala)

Kauai L, identified in the legal description in (a)(1)(i)(A), constitutes critical habitat for *Labordia tinifolia* var. *wahiawaensis* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) streambanks (a) in lowland wet forests dominated by *Metrosideros polymorpha* and (b) containing one or more of the following associated species: *Cheirodendron* sp., *Dicranopteris linearis, Cyrtandra* sp, *Antidesma* sp., *Psychotria* sp., *Hedyotis terminalis,* or *Athyrium microphyllum;* and (2) elevations between 300 to 920 m (985 to 3,020 ft).

Family Malvaceae: *Hibiscadelphus woodii* (hau kuahiwi)

Kauai G, identified in the legal description in (a)(1)(i)(A), constitutes

critical habitat for *Hibiscadelphus woodii* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) basalt talus or cliff walls (a) in *Metrosideros polymorpha* montane mesic forest and (b) containing one or more of the following associated native plant species: *Bidens sandwicensis, Artemisia australis, Melicope pallida, Dubautia* sp., *Lepidium serra, Lipochaeta* sp., *Lysimachia glutinosa, Carex meyenii, Chamaesyce celastroides* var. *hanapepensis, Hedyotis* sp., *Nototrichium* sp., *Panicum lineale, Myrsine* sp., *Stenogyne campanulata, Lobelia niihauensis,* or *Poa mannii;* and (2) elevations around 915m (3,000 ft).

Family Malvaceae: *Hibiscus clayi* (Clay's hibiscus)

Kauai N, identified in the legal description in (a)(1)(i)(A), constitutes critical habitat for *Hibiscus clayi* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) slopes (a) in *Acacia koa* or *Diospyros* sp.-*Pisonia* sp.-*Metrosideros polymorpha* lowland dry or mesic forest and (b) containing one or more of the following associated native plant species: *Hedyotis acuminata, Pipturus* sp., *Psychotria* sp., *Cyanea hardyi, Artemisia australis,* or *Bidens* sp.; and (2) elevations between 230 to 350 m (750 to 1,150 ft).

Family Malvaceae: *Hibiscus waimeae* ssp. *hannerae* (koki'o ke'oke'o)

Kauai F, identified in the legal description in (a)(1)(i)(A), constitutes critical habitat for *Hibiscus waimeae* ssp. *hannerae* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) *Metrosideros polymorpha-Dicranopteris linearis* or *Pisonia* sp.-*Charpentiera elliptica* lowland wet or mesic forest and containing one or more of the following associated native plant species: *Antidesma* sp., *Psychotria* sp., *Pipturus* sp., *Bidens* sp., *Bobea* sp., *Sadleria* sp., *Cyrtandra* sp., *Cyanea* sp., *Cibotium* sp., *Perrottetia sandwicensis,* or *Syzygium sandwicensis;* and (2) elevations between 190 and 560 m (620 and 1,850 ft).

Family Malvaceae: *Kokia kauaiensis* (koki'o)

Kauai G and I, identified in the legal descriptions in (a)(1)(i)(A), constitute critical habitat for *Kokia kauaiensis* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) diverse mesic forest containing one or more of the following associated native plant species: *Acacia koa, Metrosideros polymorpha, Bobea* sp., *Diospyros sandwicensis, Hedyotis* sp., *Pleomele* sp., *Pisonia* sp., *Xylosma* sp., *Isodendrion* sp., *Syzygium sandwicensis, Antidesma* sp., *Alyxia olivaeformis*, *Pouteria sandwicensis*, *Streblus pendulinus*, *Canthium odoratum*, *Nototrichium* sp., *Pteralyxia kauaiensis*, *Dicranopteris linearis*, *Hibiscus* sp., *Flueggea neowawraea*, *Rauvolfia sandwicensis*, *Melicope* sp., *Diellia laciniata*, *Tetraplasandra* sp., *Chamaesyce celastroides*, *Lipochaeta fauriei*, *Dodonaea viscosa*, *Santalum* sp., *Claoxylon* sp., or *Nestegis sandwicensis*; and (2) elevations between 350–660 m (1,150–2,165 ft).

Family Myrsinaceae: *Myrsine linearifolia* (kolea)

Kauai F, G, H, I, L, and P, identified in the legal descriptions in (a)(1)(i)(A), constitute critical habitat for *Myrsine linearifolia* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) diverse mesic or wet lowland or montane *Metrosideros polymorpha* forest with (a) *Cheirodendron* sp. or *Dicranopteris linearis* as co-dominants, and (b) containing one or more of the following associated native plant species: *Dubautia* sp., *Cryptocarya mannii*, *Sadleria pallida*, *Myrsine* sp., *Syzygium sandwicensis*, *Machaerina angustifolia*, *Freycinetia arborea*, *Hedyotis terminalis*, *Cheirodendron* sp., *Bobea brevipes*, *Nothocestrum* sp., *Melicope* sp., *Eurya sandwicensis*, *Psychotria* sp., *Lysimachia* sp., or native ferns; and (2) elevations between 585 to 1,280 m (1,920 to 4,200 ft).

Family Orchidaceae: *Platanthera holochila* (no common name)

Kauai H, identified in the legal description in (a)(1)(i)(A), constitutes critical habitat for *Platanthera holochila* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) *Metrosideros polymorpha-Dicranopteris linearis* montane wet forest or *M. polymorpha* mixed bog containing one or more of the following associated native plants: *Myrsine denticulata*, *Cibotium* sp., *Coprosma ernodeoides*, *Oreobolus furcatus*, *Styphelia tameiameiae*, or *Vaccinium* sp.; and (2) elevations between 1,050 and 1,600 m (3,450 and 5,245 ft).

Family Plantaginaceae: *Plantago princeps* (laukahi kuahiwi)

Kauai G, K, P, and T, identified in the legal descriptions in (a)(1)(i)(A), constitute critical habitat for *Plantago princeps* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Steep slopes, rock walls, or bases of waterfalls (a) in mesic or wet *Metrosideros polymorpha* forest and (b) containing one or more of the following associated native plant species: *Dodonaea viscosa*, *Psychotria* sp., *Dicranopteris linearis*, *Cyanea* sp., *Hedyotis* sp., *Melicope* sp., *Dubautia plantaginea*, *Exocarpos luteolus*, *Poa siphonoglossa*, *Nothocestrum peltatum*, *Remya montgomeryi*, *Stenogyne campanulata*, *Xylosma* sp., *Pleomele* sp., *Machaerina angustifolia*, *Athyrium* sp., *Bidens* sp., *Eragrostis* sp., *Lysimachia filifolia*, *Pipturus* sp., *Cyrtandra* sp., or *Myrsine linearifolia*; and (2) elevations between 480 to 1,100 m (1,580 to 3,610 ft).

Family Poaceae: *Panicum niihauense* (lau ''ehu)

Kauai J, identified in the legal description in (a)(1)(i)(A), constitutes critical habitat for *Panicum niihauense* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) sand dunes (a) in coastal shrubland and (b) containing one or more of the following associated native plant species: *Dodonaea viscosa*, *Cassytha filiformis*, *Scaevola sericea*, *Sida fallax*, *Vitex rotundifolia*, or *Sporobolus* sp.; and (2) elevations of 100 m or less (330 ft).

Family Poaceae: *Poa mannii* (Mann's bluegrass)

Kauai G, identified in the legal description in (a)(1)(i)(A), constitutes critical habitat for *Poa mannii* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) cliffs, rock faces, or stream banks (a) in lowland or montane wet, dry, or mesic *Metrosideros polymorpha* or *Acacia koa-Metrosideros polymorpha* montane mesic forest and (b) containing one or more of the following associated native plant species: *Alectryon macrococcus*, *Antidesma platyphyllum*, *Bidens cosmoides, Chamaesyce celastroides* var. *hanapepensis, Artemisia australis*, *Bidens sandwicensis*, *Lobelia sandwicensis*, *Wilkesia gymnoxiphium*, *Eragrostis variabilis*, *Panicum lineale*, *Mariscus phloides*, *Luzula hawaiiensis*, *Carex meyenii*, *C. wahuensis*, *Cyrtandra wawrae*, *Dodonaea viscosa*, *Exocarpos luteolus*, *Labordia helleri*, *Nototrichium* sp., *Schiedea amplexicaulis*, *Hedyotis terminalis*, *Melicope anisata*, *M.*

barbigera, *M. pallida*, *Pouteria sandwicensis*, *Schiedea membranacea*, *Diospyros sandwicensis*, *Psychotria mariniana*, *P. greenwelliae*, or *Kokia kauaiensis*; and (2) elevations between 460 and 1,150 m (1,510 and 3,770 ft).

Family Poaceae: *Poa sandvicensis* (Hawaiian bluegrass)

Kauai G and I, identified in the legal descriptions in (a)(1)(i)(A), constitute critical habitat for *Poa sandvicensis* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) wet, shaded, gentle or steep slopes, ridges, or rock ledges (a) in semi-open or closed, mesic or wet, diverse montane forest dominated by *Metrosideros polymorpha* and (b) containing one or more of the following associated native species: *Dodonaea viscosa*, *Dubautia* sp., *Coprosma* sp., *Melicope* sp., *Dianella sandwicensis*, *Alyxia olivaeformis*, *Bidens* sp., *Dicranopteris linearis*, *Schiedea stellarioides*, *Peperomia macraeana*, *Claoxylon sandwicense*, *Acacia koa*, *Psychotria* sp., *Hedyotis* sp., *Scaevola* sp., *Cheirodendron* sp., or *Syzygium sandwicensis;* and (2) elevations between 1,035 to 1,250 m (3,400 to 4,100 ft).

Family Poaceae: *Poa siphonoglossa* (no common name)

Kauai G, I, and U, identified in the legal descriptions in (a)(1)(i)(A), constitute critical habitat for *Poa siphonoglossa* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) shady banks near ridge crests (a) in mesic *Metrosideros polymorpha* forest and (b) containing one or more of the following associated native plant species: *Acacia koa*, *Psychotria* sp., *Scaevola* sp., *Alphitonia ponderosa*, *Zanthoxylum dipetalum*, *Tetraplasandra kauaiensis*, *Dodonaea viscosa*, *Hedyotis* sp., *Melicope* sp., *Vaccinium* sp., *Styphelia tameiameiae*, *Carex meyenii*, *Carex wahuensis*, or *Wilkesia gymnoxiphium;* and (2) elevations between 1,000 to 1,200 m (3,300 and 3,900 ft).

Family Primulaceae: *Lysimachia filifolia* (no common name)

Kauai T, identified in the legal description in (a)(1)(i)(A), constitutes critical habitat for *Lysimachia filifolia* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) mossy banks at the base of cliff faces within the spray zone of waterfalls or along streams in lowland wet forests and containing one or more of the following associated native plant species: mosses, ferns, liverworts, *Machaerina* sp., *Heteropogon contortus*, or *Melicope* sp.; and (2) elevations between 240 to 680 m (800 to 2,230 ft).

Family Rhamnaceae: *Gouania meyenii* (no common name)

Kauai G and I, identified in the legal descriptions in (a)(1)(i)(A), constitute critical habitat for *Gouania meyenii* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) rocky ledges, cliff faces, or ridge tops (a) in dry shrubland or *Metrosideros polymorpha* lowland mesic forest and (b) containing one or more of the following native plant species: *Dodonaea viscosa*, *Chamaesyce* sp., *Psychotria* sp., *Hedyotis* sp., *Melicope* sp., *Nestegis sandwicensis*, *Bidens* sp., *Carex meyenii*, *Diospyros* sp., *Lysimachia* sp., or *Senna gaudichaudii;* and (2) elevations between 490 to 880 m (1,600 to 2,880 ft).

Family Rubiaceae: *Hedyotis cookiana* ('awiwi)

Kauai G, identified in the legal description in (a)(1)(i)(A), constitutes critical habitat for *Hedyotis cookiana* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) streambeds or steep cliffs close to water sources in lowland wet forest communities; and (2) elevations between 170 and 370 m (560 and 1,210 ft).

Family Rubiaceae: *Hedyotis st.-johnii* (Na Pali beach Hedyotis)

Kauai G and J, identified in the legal descriptions in (a)(1)(i)(A), constitute critical habitat for Hedyotis st.-johnii on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) crevices of north-facing, near-vertical coastal cliff faces within the spray zone (a) in sparse dry coastal shrubland and (b) containing one or more of the following native plant species: *Myoporum sandwicense, Eragrostis variabilis, Lycium sandwicense, Heteropogon contortus, Artemisia australis* or *Chamaesyce celastroides*; and (2) elevations above 75 m (250 ft).

Family Rutaceae: *Melicope haupuensis* (alani)

Kauai G and I, identified in the legal descriptions in (a)(1)(i)(A), constitute critical habitat for *Melicope haupuensis* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) moist talus slopes (a) in *Metrosideros polymorpha* dominated lowland mesic forests or *Metrosideros polymorpha-Acacia koa* montane mesic forest and (b) containing one or more of the following associated native plant species: *Dodonaea viscosa*, *Diospyros* sp., *Psychotria mariniana*, *P. greenwelliae, Melicope ovata*, *M. anisata*, *M. barbigera*, *Dianella sandwicensis*, *Pritchardia minor*, *Tetraplasandra waimeae*, *Claoxylon sandwicensis*, *Cheirodendron trigynum*, *Pleomele aurea*, *Cryptocarya mannii, Pouteria sandwicensis, Bobea brevipes, Hedyotis terminalis*, *Elaeocarpus bifidus*, or *Antidesma* sp; and (2) elevations between 375 to 1,075 m (1,230 to 3,530 ft).

Family Rutaceae: *Melicope knudsenii* (alani)

Kauai G and I, identified in the legal descriptions in (a)(1)(i)(A), constitute critical habitat for *Melicope knudsenii* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) forested flats or talus slopes (a) in lowland dry or montane mesic forests and (b) containing one or more of the following associated native plant species: *Dodonaea viscosa, Antidesma* sp., *Metrosideros polymorpha, Xylosma* sp., *Hibiscus* sp., *Myrsine lanaiensis, Diospyros* sp., *Rauvolfia sandwicensis, Bobea* sp., *Nestegis sandwicensis, Hedyotis* sp., *Melicope* sp., *Psychotria* sp., or *Pittosporum kauaiensis*; and (2) elevations between 450 to 1,000 m (1,480 to 3,300 ft).

Family Rutaceae: *Melicope pallida* (alani)

Kauai G and I, identified in the legal descriptions in (a)(1)(i)(A), constitute critical habitat for *Melicope pallida* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) steep rock faces (a) in lowland or montane mesic or wet forests or shrubland and (b) containing one or more of the following associated native plant species: *Dodonaea viscosa, Lepidium serra, Pleomele* sp., *Boehmeria grandis, Coprosma* sp., *Hedyotis terminalis, Melicope* sp., *Pouteria sandwicensis, Poa mannii, Schiedea membranacea, Psychotria mariniana, Dianella sandwicensis, Pritchardia minor, Chamaesyce celastroides* var *hanapepensis, Nototrichium* sp., *Carex meyenii, Artemisia* sp., *Abutilon sandwicense, Alyxia olivaeformis, Dryopteris* sp., *Metrosideros polymorpha, Pipturus albidus, Sapindus oahuensis, Tetraplasandra* sp., or *Xylosma*

hawaiiense; and (2) elevations between 490 to 915 m (1,600 to 3,000 ft).

Family Rutaceae: *Zanthoxylum hawaiiense* (a'e)

Kauai I, identified in the legal description in (a)(1)(i)(A), constitutes critical habitat for *Zanthoxylum hawaiiense* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) lowland dry or mesic forests, or montane dry forest, (a) dominated by *Metrosideros polymorpha* or *Diospyros sandwicensis*, and (b) containing one or more of the following associated plant species: *Pleomele auwahiensis, Antidesma platyphyllum, Pisonia* sp., *Alectryon macrococcus, Charpentiera* sp., *Melicope* sp., *Streblus pendulinus, Myrsine lanaiensis, Sophora chrysophylla,* or *Dodonaea viscosa*; and (2) elevations between 550 and 730 m (1,800 and 2,400 ft).

Family Santalaceae: *Exocarpos luteolus* (heau)

Kauai G, H, I, L, and S, identified in the legal descriptions in (a)(1)(i)(A), constitute critical habitat for *Exocarpos luteolus* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) wet places bordering swamps; open, dry ridges (a) in lowland or montane *Metrosideros polymorpha* dominated wet forest communities and (b) containing one or more of the following native plant species: *Acacia koa, Cheirodendron trigynum, Pouteria sandwicensis, Dodonaea viscosa, Pleomele aurea, Psychotria mariniana, Psychotria greenwelliae, Bobea brevipes, Hedyotis terminalis, Elaeocarpus bifidus, Melicope haupuensis, Dubautia laevigata, Dianella sandwicensis, Poa sandwicensis, Schiedea stellarioides, Peperomia macraeana, Claoxylon sandwicense, Santalum freycinetianum, Styphelia tameiameiae,* or *Dicranopteris linearis;* and (2) elevations between 475 and 1,290 m (1,560 and 4,220 ft).

Family Sapindaceae: *Alectryon macrococcus* (mahoe)

Kauai G, I, and U, identified in the legal descriptions in (a)(1)(i)(A), constitute critical habitat for *Alectryon macrococcus* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) dry slopes or gulches (a) in *Diospyros* sp.-*Metrosideros polymorpha* lowland mesic forest, *Metrosideros polymorpha* mixed mesic forest, or *Diospyros* sp. mixed mesic forest, (b) containing one or more of the following native plant species: *Nestegis sandwicensis, Psychotria* sp., *Pisonia* sp., *Xylosma* sp., *Streblus pendulinus, Hibiscus* sp., *Antidesma* sp., *Pleomele* sp., *Acacia koa, Melicope knudsenii, Hibiscus waimeae, Pteralyxia* sp., *Zanthoxylum* sp., *Kokia kauaiensis, Rauvolfia sandwicensis, Myrsine lanaiensis, Canthium odoratum, Canavalia* sp., *Alyxia oliviformis, Nesoluma polynesicum, Munroidendron racemosum, Caesalpinia kauaiense, Tetraplasandra* sp., *Pouteria sandwicensis,* or *Bobea timonioides;* and (2) elevations between 360 to 1,070 m (1,180 to 3,510 ft).

Family Solanaceae: *Nothocestrum peltatum* ('aiea)

Kauai G and I, identified in the legal descriptions in (a)(1)(i)(A), constitute critical habitat for *Nothocestrum peltatum* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) rich soil on steep slopes (a) in montane or lowland mesic or wet forest dominated by *Acacia koa* or a mixture of *Acacia koa* and *Metrosideros polymorpha,* and (b) containing one or more of the following associated native plant species: *Antidesma* sp., *Dicranopteris linearis, Bobea brevipes, Elaeocarpus bifidus, Alphitonia ponderosa, Melicope anisata, M. barbigera, M. haupuensis, Pouteria sandwicensis, Dodonaea viscosa, Dianella sandwicensis, Tetraplasandra kauaiensis, Claoxylon sandwicensis, Cheirodendron trigynum, Psychotria mariniana, P. greenwelliae, Hedyotis terminalis, Ilex anomala, Xylosma* sp., *Cryptocarya mannii, Coprosma* sp., *Pleomele aurea, Diplazium sandwicensis, Broussaisia arguta,* or *Perrottetia sandwicensis;* and (2) elevations between 915 to 1,220 m (3,000 to 4,000 ft).

Family Solanaceae: *Solanum sandwicense* ('aiakeaakua, popolu)

Kauai D, G, and I, identified in the legal descriptions in (a)(1)(i)(A), constitute critical habitat for *Solanum sandwicense* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) open, sunny areas (a) in diverse lowland or montane mesic or wet forests and (b) containing one or more of the following associated plants: *Alphitonia ponderosa, Ilex anomala, Xylosma* sp., *Athyrium sandwicensis, Syzygium sandwicensis, Bidens cosmoides, Dianella sandwicensis, Poa siphonoglossa, Carex meyenii, Hedyotis* sp., *Coprosma* sp., *Dubautia* sp., *Pouteria sandwicensis, Cryptocarya mannii, Acacia koa, Metrosideros polymorpha, Dicranopteris linearis, Psychotria* sp., or *Melicope* sp.; and (2) elevations between 760 and 1,220 m (2,500 and 4,000 ft).

Family Violaceae: *Isodendrion laurifolium* (aupaka)

Kauai G, I, and U, identified in the legal descriptions in (a)(1)(i)(A), constitute critical habitat for *Isodendrion laurifolium* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) diverse mesic or wet forest (a) dominated by *Metrosideros polymorpha, Acacia koa,* or *Diospyros* sp. and (b) containing one or more of the following associated native plant species: *Kokia kauaiensis, Streblus* sp., *Elaeocarpus bifidus, Canthium odoratum, Antidesma* sp., *Xylosma hawaiiense, Hedyotis terminalis, Pisonia* sp., *Nestegis sandwicensis, Dodonaea viscosa, Euphorbia haeleeleana, Pleomele* sp., *Pittosporum* sp., *Melicope* sp., *Claoxylon sandwicense, Alphitonia ponderosa, Myrsine lanaiensis,* or *Pouteria sandwicensis;* and (2) elevations between 490 and 820 m (1,600 and 2,700 ft).

Family Violaceae: *Isodendrion longifolium* (aupaka)

Kauai F, G, L, M, and P, identified in the legal descriptions in (a)(1)(i)(A), constitute critical habitat for *Isodendrion longifolium* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) steep slopes, gulches, or stream banks (a) in mesic or wet *Metrosideros polymorpha* forests and (b) containing one or more of the following native species: *Dicranopteris linearis, Eugenia* sp., *Diospyros* sp., *Pritchardia* sp., *Canthium odoratum, Melicope* sp., *Cheirodendron* sp., *Ilex anomala, Pipturus* sp., *Hedyotis fluviatilis, Peperomia* sp., *Bidens* sp., *Nestegis sandwicensis, Cyanea hardyi, Syzygium* sp., *Cibotium* sp., *Bobea brevipes, Antidesma* sp., *Cyrtandra* sp., *Hedyotis terminalis, Peperomia* sp., *Perrottetia sandwicensis, Pittosporum* sp., or *Psychotria* sp.; and (2) elevations between 410 to 760 m (1,345 to 2,500 ft).

Family Violaceae: *Viola helenae* (no common name)

Kauai L, identified in the legal description in (a)(1)(i)(A), constitutes critical habitat for *Viola helenae* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat are habitat components

that provide: (1) stream banks or adjacent valley bottoms with light to moderate shade in *Metrosideros polymorpha-Dicranopteris linearis* lowland wet forest; and (2) elevations between 610–855 m (2,000–2,800 ft).

Family Violaceae: *Viola kauaiensis* var. *wahiawaensis* (nani wai'ale'ale)

Kauai L, identified in the legal description in (a)(1)(i)(A), constitutes critical habitat for *Viola kauaiensis* var. *wahiawaensis* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) open montane bog or wet shrubland containing one or more of the following native plant species: *Dicranopteris linearis, Diplopterygium pinnatum, Syzygium sandwicensis,* or *Metrosideros polymorpha;* and (2) elevations between 640 and 865 m (2,100 and 2,840 ft).

(B) Ferns and Allies.

Family Aspleniaceae: *Diellia pallida* (no common name)

Kauai G and I, identified in the legal descriptions in (a)(1)(i)(A), constitute critical habitat for *Diellia pallida* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) bare soil on steep, rocky, dry slopes (a) in lowland mesic forests and (b) containing one or more of the following native plant species: *Acacia koa, Alectryon macrococcus, Antidesma platyphyllum, Metrosideros polymorpha, Myrsine lanaiensis, Zanthoxylum dipetalum, Tetraplasandra kauaiensis, Psychotria mariniana, Carex meyenii, Diospyros hillebrandii, Hedyotis knudsenii, Canthium odoratum, Pteralyxia kauaiensis, Nestegis sandwicensis, Alyxia olivaeformis, Wilkesia gymnoxiphium, Alphitonia ponderosa, Styphelia tameiameiae,* or *Rauvolfia sandwicensis;* and (2) elevations between 530 to 915 m (1,700 to 3,000 ft).

Family Grammitidaceae: *Adenophorus periens* (pendant kihi fern)

Kauai F, G, K, L, P, and R, identified in the legal descriptions in (a)(1)(i)(A), constitute critical habitat for *Adenophorus periens* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) well-developed, closed canopy that provides deep shade or high humidity (a) in *Metrosideros polymorpha-Cibotium glaucum* lowland wet forests, open *Metrosideros polymorpha* montane wet forest, or *Metrosideros polymorpha-Dicranopteris linearis* lowland wet forest, and (b) containing one or more of the following native plant species: *Athyrium sandwicensis, Broussaisia* sp., *Cheirodendron trigynum, Cyanea* sp., *Cyrtandra* sp., *Dicranopteris linearis, Freycinetia arborea, Hedyotis terminalis, Labordia hirtella, Machaerina angustifolia, Psychotria* sp., *Psychotria hexandra,* or *Syzygium sandwicensis;* and (2) elevations between 400 and 1,265 m (1,310 and 4,150 ft).

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Dated: August 24, 2000.

Stephen C. Saunders,

Assistant Secretary for Fish and Wildlife and Parks.

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