DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

RIN 1018–AI24

Endangered and Threatened Wildlife and Plants; Designations of Critical Habitat for Plant Species From the Island of Oahu, HI

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule concerning designation of critical habitat.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), propose critical habitat for 99 of the 101 plant species known historically from the island of Oahu that are listed under the Endangered Species Act of 1973, as amended.

Critical habitat is not proposed for two species, *Pritchardia kaalae* and *Cyrtandra crenata.* We propose that critical habitat designation is not prudent for *Pritchardia kaalae* because it would likely increase the threat from vandalism or collection of this species on Oahu. Critical habitat is not proposed for *Cyrtandra crenata,* a species known only from Oahu, and for which we propose that critical habitat designation is not prudent because it has not been seen recently in the wild and no viable genetic material of this species is known to exist.

We propose critical habitat designations for 99 species within 25 critical habitat units totaling approximately 45,067 hectares (111,364 acres) on the island of Oahu.

If this proposal is made final, section 7 of the Act requires Federal agencies to ensure that actions they carry out, fund, or authorize 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. Section 4 of the Act requires us to consider economic and other relevant impacts of specifying any particular area as critical habitat.

We solicit data and comments from the public on all aspects of this proposal, including data on the economic and other impacts of the designations. We may revise or further refine critical habitat boundaries prior to final designation based on habitat and plant surveys, public comment on the proposed critical habitat rule, and new scientific and commercial information.

DATES: We will accept comments until July 29, 2002. Public hearing requests must be received by July 12, 2002.

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., Room 3–122, P.O. Box 50088, Honolulu, HI 96850–0001.

2. You may hand-deliver written comments to our Pacific Islands Office at the address given above.

3. You may send comments by electronic mail (e-mail) to: FW1PIE_Oahu_crithab@r1.fws.gov. See the *Public Comments Solicited* section in Supplementary Information below for file format and other information about electronic filing.

You may view comments and materials received, as well as supporting documentation used in the preparation of this proposed rule, by appointment, during normal business hours at the above address.

FOR FURTHER INFORMATION CONTACT: Paul Henson, Field Supervisor, Pacific Islands Office (see **ADDRESSES** section) (telephone: 808/541–3441; facsimile: 808/541–3470).

SUPPLEMENTARY INFORMATION:

Background

In the Lists of Endangered and Threatened Plants (50 CFR 17.12), there are 101 plant species that, at the time of listing, were reported from the island of Oahu. Fifty-six of these species are endemic to Oahu, while 45 species are reported from one or more other islands, as well as Oahu (Table 1).

TABLE 1.—SUMMARY OF ISLAND DISTRIBUTION OF 101 SPECIES FROM OAHU

Species	Island distribution						
	Kauai	Oahu	Molokai	Lanai	Maui	Hawaii	NW Islands, Kahoolawe, Niihau
Abutilon sandwicense (No common name)	.....	C	.....	.....	.....	.....	.....
Adenophorus periens (pendant kihi fern)	C	H	C	H	H	C	.....
Alectryon macrococcus (mahoe)	C	C	C	.....	C	.....	.....
Alsinidendron obovatum (No common name)	.....	C	.....	.....	.....	.....	.....
Alsinidendron trinerve (No common name)	.....	C	.....	.....	.....	.....	.....
Bonamia menziesii (No common name)	C	C	H	C	C	C	.....
Cenchrus agrimonioides (kamanomano)	.....	C	.....	H	C	.....	NW (H)
Centaurium sebaeoides (awiwi)	C	C	H	C	C	.....	.....
Chamaesyce celastroides var. *kaenana* (akoko)	.....	C	.....	.....	.....	.....	.....
Chamaesyce deppeana (akoko)	.....	C	.....	.....	.....	.....	.....
Chamaesyce herbstii	.....	C	.....	.....	.....	.....	.....
Chamaesyce kuwaleana (akoko)	.....	C	.....	.....	.....	.....	.....
Chamaesyce rockii (akoko)	.....	C	.....	.....	.....	.....	.....
Colubrina oppositifolia (kauila)	.....	C	.....	.....	C	C	.....
Colubrina squamigera (pauoa)	.....	C	.....	.....	C	C	.....
Ctenitis squamigera (pauoa)	H	C	C	C	C	H	.....
Cyanea acuminata (haha)	.....	C	.....	.....	.....	.....	.....
Cyanea crispa (haha)	.....	C	.....	.....	.....	.....	.....
Cyanea grimesiana ssp. *grimesiana* (haha)	.....	C	C	C	C	.....	.....
Cyanea grimesiana ssp. *obatae* (haha)	.....	C	.....	.....	.....	.....	.....

TABLE 1.—SUMMARY OF ISLAND DISTRIBUTION OF 101 SPECIES FROM OAHU—Continued

Species	Island distribution						
	Kauai	Oahu	Molokai	Lanai	Maui	Hawaii	NW Islands, Kahoolawe, Niihau
Cyanea humboltiana (haha)		C					
Cyanea kolauensis (haha)		C					
Cyanea longiflora (haha)		C					
Cyanea pinnatifida (haha)		H					
Cyanea st.-johnii (haha)		C					
Cyanea superba (haha)		C					
Cyanea truncata (haha)		C					
Cyperus trachysanthos (puukaa)	C	C	H	H			Ni (H)
Cyrtandra crenata (haiwale)		H					
Cyrtandra dentata (haiwale)		C					
Cyrtandra polyantha (haiwale)		C					
Cyrtandra subumbellata (haiwale)		C					
Cyrtandra viridiflora (haiwale)		C					
Delissea subcordata (No common name)		C					
Diellia erecta (No common name)	H	C	C	H	C	C	
Diellia falcata (No common name)		C					
Diellia unisora (No common name)		C					
Diplazium molokaiense (No common name)	H	H	H	H	C		
Dubautia herbstobatae (naenae)		C					
Eragrostis fostergii (No common name)		C					
Eugenia koolauensis (nioi)		C	H				
Euphorbia haeleeleana (akoko)	C	C					
Flueggea neowawraea (mehamehame)	C	C	H		C	C	
Gardenia mannii (nanu)		C					
Gouania meyenii (No common name)	C	C					
Gouania vitifolia (No common name)		C			H	C	
Hedyotis coriacea (kioele)		H			C	C	
Hedyotis degeneri (No common name)		C					
Hedyotis parvula (No common name)		C					
Hesperomannia arborescens (No common name)		C	C	H	C		
Hesperomannia arbuscula (No common name)		C			C		
Hibiscus brackenridgei (mao hau hele)	R	C	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)
Labordia cyrtandrae (kamakahala)		C					
Lepidium arbuscula (anaunau)		C					
Lipochaeta lobata var. *leptophylla* (nehe)		C					
Lipochaeta tenuifolia (nehe)		C					
Lobelia gaudichaudii ssp. *koolauensis* (No common name)		C					
Lobelia monostachya (No common name)		C					
Lobelia niihauensis (No common name)	C	C					Ni (H)
Lobelia oahuensis (No common name)		C					
Lysimachia filifolia (No common name)	C	C					
Mariscus pennatiformis (No common name)	H	H			C	H	NW (C)
Marsilea villosa (ihi ihi)		C	C				Ni (H)
Melicope lydgatei (alani)		C					
Melicope pallida (alani)	C	C					
Melicope saint-johnii (alani)		C					
Myrsine juddii (kolea)		C					
Neraudia angulata (No common name)		C					
Nototrichium humile (kului)		C			H		
Peucedanum sandwicense (makou)	C	C	C		C		
Phlegmariurus nutans (wawaeiole)	H	C					
Phyllostegia hirsuta (No common name)		C					
Phyllostegia kaalaensis (No common name)		C					
Phyllostegia mollis (No common name)		C	H		C		
Phyllostegia parviflora (No common name)		C			H	H	
Plantago princeps (laukahi kauhiwi)	C	C	C		C	H	

TABLE 1.—SUMMARY OF ISLAND DISTRIBUTION OF 101 SPECIES FROM OAHU—Continued

Species	Island distribution						
	Kauai	Oahu	Molokai	Lanai	Maui	Hawaii	NW Islands, Kahoolawe, Niihau
Platanthera holochila (No common name)	C	H	C	.....	C	.....	.....
Pritichardia kaalae (loulu)	.....	C	.....	.....	.....	.....	.....
Pteris lidgatei (No common name)	.....	C	H	.....	C	.....	.....
Sanicula mariversa (No common name)	.....	C	.....	.....	.....	.....	.....
Sanicula purpurea (No common name)	.....	C	.....	.....	C	.....	.....
Schiedea hookeri (No common name)	.....	C	.....	.....	H	.....	.....
Schiedea kaalae (No common name)	.....	C	.....	.....	.....	.....	.....
Schiedea kealia (No common name)	.....	C	.....	.....	.....	.....	.....
Schiedea nuttallii (No common name)	C	C	C	.....	H	.....	.....
Sesbania tomentosa (ohai)	C	C	C	H	C	C	Ni (H), Ka (C), NW (C)
Silene lanceolata (No common name)	H	C	C	H	.....	C	.....
Silene perlmanii (No common name)	.....	H	.....	.....	.....	.....	.....
Solanum sandwicense (aiakeakua, popolo)	C	H	.....	.....	.....	.....	.....
Spermolepis hawaiiensis (No common name)	C	C	C	C	C	C	.....
Stenogyne kanehoana (No common name)	.....	C	.....	.....	.....	.....	.....
Tetramolopium filiforme (No common name)	.....	C	.....	.....	.....	.....	.....
Tetramolopium lepidotum ssp. *lepidotum* (No common name)	.....	C	.....	H	.....	.....	.....
Tetraplasandra gymnocarpa (oheohe)	.....	C	.....	.....	.....	.....	.....
Trematalobelia singularis (No common name)	.....	C	.....	.....	.....	.....	.....
Urera kaalae (opuhe)	.....	C	.....	.....	.....	.....	.....
Vigna o-wahuensis (No common name)	.....	H	C	C	C	C	Ni (H), Ka (C)
Viola chamissoniana ssp. *chamissoniana* (olopu)	.....	C	.....	.....	.....	.....	.....
Viola oahuesis (No common name)	.....	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.
NW—NW Hawaiian Islands.
Ka—Kahoolawe.
Ni—Niihau.

We have reconsidered our findings concerning whether designating critical habitat for these 56 federally protected plants from the island of Oahu is prudent. In this proposal, we are proposing that critical habitat is prudent for 54 of these species (*Abutilon sandwicense*, *Alsinidendron obovatum*, *Alsinidendron trinerve*, *Chamaesyce celastroides* var. *kaenana*, *Chamaesyce deppeana*, *Chamaesyce herbstii*, *Chamaesyce kuwaleana*, *Chamaesyce rockii*, *Cyanea acuminata*, *Cyanea crispa*, *Cyanea grimesiana* ssp. *obatae*, *Cyanea humboltiana*, *Cyanea koolauensis*, *Cyanea longiflora*, *Cyanea pinnatifida*, *Cyanea st.-johnii*, *Cyanea superba*, *Cyanea truncata*, *Cyrtandra dentata*, *Cyrtandra polyantha*, *Cyrtandra subumbellata*, *Cyrtandra viridiflora*, *Delissea subcordata*, *Diellia falcata*, *Diellia unisora*, *Dubautia herbstobatae*, *Eragrostis fosbergii*, *Gardenia mannii*, *Hedyotis degeneri*, *Hedyotis parvula*, *Labordia cyrtandrae*, *Lepidium arbuscula*, *Lipochaeta lobata* var. *leptophylla*, *Lipochaeta tenuifolia*, *Lobelia gaudichaudii* ssp. *koolauensis*, *Lobelia monostachya*, *Lobelia oahuensis*, *Melicope lydgatei*, *Melicope saint-johnii*, *Myrsine juddii*, *Neraudia angulata*, *Phyllostegia hirsuta*, *Phyllostegia kaalaensis*, *Sanicula mariversa*, *Schiedea kaalae*, *Schiedea kealiae*, *Silene perlmanii*, *Stenogyne kanehoana*, *Tetramolopium filiforme*, *Tetraplasandra gymnocarpa*, *Trematalobelia singularis*, *Urera kaalae*, *Viola chamissoniana* ssp. *chamissoniana*, and *Viola oahuensis*) because the potential benefits of designating critical habitat essential for the conservation of these species outweigh the risk that may result from human activity because of critical habitat designation.

We propose that critical habitat designation is not prudent for *Pritchardia kaalae* because it would likely increase the threat from vandalism or collection of this species of loulu palm on Oahu. We propose that critical habitat designation is not prudent for *Cyrtandra crenata*, a species known only from Oahu that has not been seen recently in the wild and for which no viable genetic material is known to exist.

Proposed prudency determinations for 45 other species (*Adenophorus periens*, *Alectryon macrococcus*, *Bonamia menziesii*, *Cenchrus agrimonioides*, *Centaurium sebaeoides*, *Colubrina oppositifolia*, *Ctenitis squamigera*, *Cyanea grimesiana* ssp. *grimesiana*, *Cyperus trachysanthos*, *Diellia erecta*, *Diplazium molokaiense*, *Eugenia koolauensis*, *Euphorbia haeleeleana*, *Flueggea neowawraea*,

Gouania meyenii, *Gouania vitifolia*, *Hedyotis coriacea*, *Hesperomannia arborescens*, *Hesperomannia arbuscula*, *Hibiscus brackenridgei*, *Isodendrion laurifolium*, *Isodendrion longifolium*, *Isodendrion pyrifolium*, *Lobelia niihauensis*, *Lysimachia filifolia*, *Mariscus pennatiformis*, *Marsilea villosa*, *Melicope pallida*, *Nototrichium humile*, *Peucedanum sandwicense*, *Phlegmariurus nutans*, *Phyllostegia mollis*, *Phyllostegia parviflora*, *Plantago princeps*, *Platanthera holochila*, *Pteris lidgatei*, *Sanicula purpurea*, *Schiedea hookeri*, *Schiedea nuttallii*, *Sesbania tomentosa, Silene lanceolata, Solanum sandwicense, Spermolepis hawaiiensis*, *Tetramolopium lepidotum* ssp. *lepidotum*, and *Vigna o-wahuensis*) which are reported from Oahu as well as Kauai, Niihau, Maui, Kahoolawe, Lanai, Molokai, the Northwestern Hawaiian Islands, and/or the island of Hawaii were published in the proposed rules published on November 7, 2000, and January 28, 2000 (Kauai and Niihau, 65 FR 66808 and 67 FR 3939); on December 18, 2000 and April 3, 2002 (Maui and Kahoolawe 65 FR 79192 and 67 FR 15856); on December 27, 2000 and March 4, 2002 (Lanai 65 FR 82086 and 67 FR 9806); on December 29, 2000 and April 5, 2002 (Molokai 65 FR 83158 and 67 FR 16492); on May 14, 2002 (Northwestern Hawaiian Islands 67 FR 34522), or elsewhere in this issue of the **Federal Register** (Hawaii Island).

Critical habitat for 99 of these 101 species from Oahu is proposed at this time. Critical habitat is not proposed for two species, *Pritchardia kaalae* and *Crytandra crenata*, for which we determine that designation of critical habitat is not prudent for the reasons described above.

The Island of Oahu

The island of Oahu was formed from the remnants of two large shield volcanoes, the younger Koolau volcano to the east and the older Waianae volcano to the west (60 FR 51398; Service 1995a, 1996b). Their original shield volcano shape has been lost as a result of extensive erosion, and today these volcanoes are called mountains or ranges, and consist of long, narrow ridges. The Koolau Mountains were built by eruptions that took place primarily along a northwest-trending rift zone and formed a range now approximately 60 kilometers (km) (37 miles (mi)) long (Service 1996b). Median annual rainfall for the Koolau Mountains varies from 100 to 710 centimeters (cm) (40 to 280 inches (in)), most of which is received at higher elevations along the entire length of the windward (northeastern) side (Service 1996b).

The Waianae Mountains were built by eruptions that took place primarily along three rift zones. The two principal rift zones run in a northwestward and south-southeastward direction from the summit, and a lesser one runs to the northeast. The range is approximately 32 km (20 mi) long. The caldera lies between the north side of Makaha Valley and the head of Nanakuli Valley (MacDonald *et al.* 1983). The Waianae Mountains are in the rain shadow of the parallel Koolau Mountains and receive much less rainfall, except for Mt. Kaala, the highest point on Oahu at 1,225 meters (m) (4,020 feet (ft)) (Wagner *et al.* 1999). The median annual rainfall for the Waianae Mountains varies from 51 to 19 cm (20 to 75 in), with only the small summit area of Mt. Kaala receiving the highest amount (Service 1995a).

Discussion of the Plant Taxa

Species Endemic to Oahu

Abutilon sandwicense (No Common Name (NCN))

Abutilon sandwicense, a member of the mallow family (Malvaceae) and a short-lived perennial, is a shrub that grows to 3 m (5 ft) tall and is covered with short glandular hairs. This species is distinguished from others in the genus by the green or reddish-brown tipped petals which extend beyond the sepals (Bates 1999).

Abutilon sandwicense has been observed flowering in winter and spring. By summer, most plants have flowered and the fruits have usually dried up by fall. Fruit capsules develop within 6 weeks. Although seedlings are often initially abundant, few plants appear to survive to maturity for unknown reasons (56 FR 55770).

Historically, *Abutilon sandwicense* was known from nearly the entire length of the Waianae Mountains, from Makaleha Valley to Nanakuli Valley. This species is now known from Huliwai Gulch, Kaawa Gulch, Kaimuhole Gulch, Palikea Gulch, Makaha Valley, Makaha-Waianae Kai Ridge, Makaleha Valley, Manuwai Gulch, Halona subdistrict, Mikilua subdistrict, Alaiheihe Gulch, and Nanakuli Valley on Federal, State, private, city, and county lands. The 16 known populations contain an estimated 253 to 263 individuals (Hawaii Heritage Program (HINHP) Database 2001; Bates 1999).

Abutilon sandwicense typically grows on steep slopes or gulches in dry to mesic lowland forest between 149 and 875 m (489 and 2,870 ft) elevation. Associated species include *Sapindus oahuensis* (lonomea), *Eugenia reinwardtiana* (nioi), *Hibiscus arnottianus* (kokio keokeo), *Psydrax odorata* (alahee), *Diospyros sandwicensis* (lama), *Reynoldsia sandwicensis* (ohe), *Nestegis sandwicensis* (olopua), *Antidesma pulvinatum* (hame), *Pittosporum* sp. (hoawa), *Pleomele* sp. (hala pepe), *Rauvolfia sandwicensis* (hao), *Myrsine lanaiensis* (kolea), *Pisonia* sp. (papala kepau), *Metrosideros polymorpha* (ohia), *Pipturus albidus* (mamaki), and *Elaeocarpus bifidus* (kalia) (Bates 1999; HINHP Database 2001; Environmental Division of the U.S. Army (EDA), *in litt.* 2001).

The major threats to *Abutilon sandwicense* are competition from the alien plant species *Pimenta dioica* (allspice), *Hyptis pectinata* (Comb hyptis), *Schinus terebinthifolius* (Christmasberry), *Syzygium cumini* (Java plum), *Clidemia hirta* (Koster's curse), *Ipomoea sp.* (morning glory), *Melinis minutiflora* (molasses grass), *Ficus microcarpa* (Chinese banyan), *Psidium cattleianum* (strawberry guava), *Psidium guajava* (guava), *Kalanchoe pinnata* (air plant), *Oplismenus hirtellus* (basketgrass), *Ageratina riparia* (haumakua pamakani), *Leucaena leucocephala* (koa haole), *Toona ciliata* (Australian red cedar), *Grevillea robusta* (silk oak), *Montanoa hibiscifolia* (tree daisy), *Aleurites moloccana* (kuku i), *Rivina humilis* (coral berry), *Panicum maximum* (Guinea grass), *Melia azedarach* (chinaberry), and *Passiflora suberosa* (huehue haole); fire; black twig borer (*Xylosandrus compactus*); Chinese rose beetle (*Adoretus sinicus*); feral pigs (*Sus scrofa*) and goats (*Capra hircus*); and trampling by feral cattle (*Bos taurus*) (56 FR 55770; Service 1998b).

Alsinidendron obovatum (NCN)

Alsinidendron obovatum, a member of the pink family (Caryophyllaceae) and a short-lived perennial, is a branching subshrub growing to 3 ft (1 m) tall with thick, somewhat fleshy leaves. This species and *Alsinidendron trinerve* can be distinguished from other members of the genus by their shrubby habit and fleshy purple sepals surrounding the capsule (Wagner *et al.* 1999).

Alsinidendron obovatum generally flowers after about 2 years of growth. Plants flower and fruit year round, but flowering is usually heavier in winter and spring depending on the level of precipitation. Plants survive 3 to 6 years, unless there are drought conditions (56 FR 55770).

Historically, *Alsinidendron obovatum* was known from the northern and

southern end of the Waianae Range. This species remains in Keawapilau Gulch, Kahanakaiki Gulch, Makaleha, Kapuna Gulch, and Pahole Gulch on Federal and State lands. The five known populations contain about 8 to 10 individuals (HINHP Database 2001; EDA Database 2001;Wagner *et al.* 1999).

Alsinidendron obovatum typically grows on ridges and slopes in lowland diverse mesic forest dominated by *Acacia koa* (koa) and *Metrosideros polymorpha* between 476 and 943 m (1,561 and 3,093 ft) elevation. Associated species include *Bidens torta* (kookoolau), *Antidesma platyphyllum* (hame), *Cibotium chamissoi* (hapuu), *Hedyotis terminalis* (manono), *Pipturu* sp. (mamaki), *Machaerina* sp. (uki), *Peperomia* sp. (ala ala wai nui), *Perrottetia sandwicensis* (olomea), *Ilex anomala* (kawau), *Psydrax odorata, Coprosma* sp. (pilo), *Alyxia oliviformis* (maile), or the endangered *cyanea lingiflora* (HINHP Database 2001; EDA, *in litt.* 2001).

The major threats to *Alsinidendron obovatum* are competition from the aggressive alien plant species *Melinus minutiflora, Schinus terebinthifolius, Psidium cattleianum, Blechnum occidentale* (NCN), *Clidemia hirta, Grevillea robusta, Stachytarpheta dichotoma* (owi), *Paspalum conjugatum* (Hilo grass), and *Rubus argutus* (prickly Florida blackberry); habitat degradation by feral pigs; trampling by humans; rockslides, and the small number of populations (56 FR 55770; Service 1998b).

Alsinidendron trinerve (NCN)

Alsinidendron trinerve, a member of the pink family (Caryophyllaceae) and a short-lived perennial, is very similar in appearance to *A. obovatum* but differs in that it has a more open inflorescence (flowering part of plant) with peduncles (stalk of a flower) more than 2 cm (0.8 in) long, sepals (leaves of the outer series floral leaves, i.e., calyx) with an acute tip, and usually is found in wet forests above 914 m (3,000 ft) in elevation. *Alsinidendron obovatum* has a congested inflorescence with peduncles less than 2 cm (0.8 in) long, sepals with a rounded tip, and usually grows in mesic forests 550 to 792 m (1,800 to 2,600 ft) in elevation (Wagner *et al.* 1999).

Alsinidendron trinerve flowers and fruits throughout the year with the possible exception of fall (56 FR 55770).

Historically, *Alsinidendron trinerve* was known from the north-central and southern Waianae Mountains. This species is known to be in Makaleha Gulch, on Mt. Kaala and Puu Kalena on Federal and State lands. The three known populations total between 18 and 34 individuals (HINHP Database 2001; EDA Database 2001).

Alsinidendron trinerve typically grows on slopes in wet forest or the wetter portions of diverse mesic forest dominated by *Metrosideros polymorpha* and *Ilex anomala* or *Metrosideros polymorpha* montane wet forest between 833 and 1,233 m (2,732 and 4,044 ft) elevation. Associated species include *Machaerina* sp., *Hedyotis* sp. (NCN), *Peperomia* sp., *Perrottetia sandwicensis, Athyrium sandwichianum* (akolea), *Broussaisia arguta* (kanawao), *Vaccinium* sp. (ohelo), *Phyllostegia* sp. (NCN), *Coprosma ochracea* (pilo), *Gunnera* sp. (apeape), *Nothoperanema rubiginosa,* or *Pipturus albidus* (HINHP Database 2001; EDA, *in litt.* 2001; Wagner *et al.* 1999).

The major threats to *Alsinidendron trinerve* are competition from the aggressive alien plant species *Rubus argutus, Buddleia asiatica* (butterfly bush), *Clidemia hirta,* and *Kalanchoe pinnata;* habitat degradation by feral pigs; trampling by humans along trails; and the small number of extant individuals (56 FR 55770; Service 1998b).

Chamaesyce celastroides var. *kaenana* (akoko)

Chamaesyce celastroides var. *kaenana,* a member of the spurge family (Euphorbiaceae) and a short-lived perennial, is a low-growing or upright shrub to 5 ft (1.5 m) tall with milky sap and leaves which fall off during the dry season, are mostly hairless and are arranged in two opposite rows along the stem. This species is distinguished from other members of the genus in the area in which it grows in that it is a woody shrub; the other members of the genus in the area are herbs or small subshrubs (Koutnik and Huft 1999).

Chamaesyce celastroides var. *kaenana* has been observed flowering and fruiting throughout the year, probably in response to precipitation. Fruits mature in three to four weeks and plants live from five to ten years. No additional information is available on reproductive cycles, longevity, specific environmental requirements or limiting factors (56 FR 55770).

Historically, *Chamaesyce celastroides* var. *kaenana* was known from the northwestern end of the Waianae Mountains as well as from one collection from the southeastern end of the Koolau Mountains. This taxon remains at Kaena Point, Keawaula, Alau Gulch, Waianae Kai, and Kahanahaiki on State land and land under Federal jurisdiction. The 13 known populations contain 569 individuals (HINHP Database 2001; Koutnik and Huft 1999).

Chamaesyce celastroides var. *kaenana* typically grows in coastal dry shrubland on windward talus slopes, leeward rocky cliffs, open grassy slopes, or on vegetated cliff faces between sea level and 862 m (0 and 2,827 ft) elevation. Associated species include: *Lipochaeta lobata* (nehe), *Myoporum sandwicense* (naio), *Heteropogon contus* (pili grass), *Santalum* sp.(ili ahi), *Plumbago zeylanica* (iliee), *Psydrax odorata, Boerhavia* sp. (alena), *Waltheria indica* (uhaloa), *Dodonaea viscosa* (aalii), *Artemisia australis* (ahinahina), *Psilotum nudum* (moa), *Chamaesyce celastroides* var. *amplectans* (akoko), *Gossypium tomentosum* (mao), *Jacquemontia ovalifolia* ssp. *sandwicensis* (pauohiiaka), *Santalum freycinetianum* (iliahi), or *Sida fallax* (ilima) (HINHP Database 2001; EDA, *in litt.* 2001).

The major threats to *Chamaesyce celastroides* var. *kaenana* are competition from the alien plant species *Leucaena leucocephala, Melinis repens* (natal redtop), *Schinus terebinthifolius, Pluchea symphytitfolia* (sourbush), *Hyptis pectinata, Panicum maximum, Grevillea robusta,* and *Acacia confusa* (Formosakoa); fire; and effects of recreational activities (56 FR 55770; Service 1998b).

Chamaesyce deppeana (Akoko)

Chamaesyce deppeana, a member of the spurge family (Euphorbiaceae) and a short-lived perennial, is an erect subshrub up to 1.2 m (4 ft) tall with fuzzy branches. The hairless leaves, generally oval-shaped and often notched at their tips, are between 5 and 20 millimeter (mm) (0.2 and 0.8 in) long and 5 and 12 mm (0.2 and 0.5 in) wide; they are arranged in two opposite rows along the stem. The leaf margins are usually toothed. The small, petalless flower clusters, 1.5 to 3 mm (0.06 to 0.1 in) wide, are borne singly in the leaf axils (point between the stem and leaf stalk) and produce small capsules about 2 mm (0.1 in) long. Seeds have not been observed. This species is distinguished from others in the genus by the following combination of characters leaves arranged in two rows on opposite sides of the branches, leaves glabrous, leaf apex notched, leaf margin toothed, and cyathia width (Koutnik and Huft 1999).

Chamaesyce deppeana has been observed in flower in May and September. No further information is available on reproductive cycles, specific environmental requirements, or limiting factors (Service 1998b).

Historically, *Chamaesyce deppeana* was known only from southern Oahu. Because the few collections that were made were collected prior to the 20th century, it was thought to be extinct. In 1986, Joel Lau and Sam Gon of The Nature Conservancy of Hawaii (TNCH) rediscovered *C. deppeana* on State land in the southern Koolau Mountains of Oahu in Nuuanu Pali Wayside State Park near the Pali Lookout, a popular tourist attraction. About 50 individuals grow near there (HINHP Database 2001; Koutnik and Huft 1999).

The habitat of the only known population of *Chamaesyce deppeana* is windward-facing ridge crests, cliff faces and mixed native cliffs with such plant species as *Metrosideros polymorpha* or *Bidens sandvicensis* (kookoolau) between 274 and 661 m (899 and 2,168 ft) elevation (HINHP Database 2001).

The major threats to the single known population of *Chamaesyce deppeana* are competition for water, space, light, and nutrients with the alien plant species *Casuarina equisetifolia* (common ironwood), *Paspalum conjugatum,* and *Schinus terebinthifolius;* and extinction due to naturally caused events because of the limited number of individuals and restricted range. Fire and impact by humans threaten the species as well (59 FR 14482; Service 1998b; HINHP Database 2001).

Chamaesyce herbstii (Akoko)

Chamaesyce herbstii, a member of the spurge family (Euphorbiaceae) and a short-lived perennial, is a small tree ranging from 3 to 8 m (10 to 26 ft) tall with thin, leathery leaves arranged in pairs on the same plane. This species is distinguished from others in the genus by the length of the flowering stalk and the color of the angular fruits (Koutnik and Huft 1999).

Chamaesyce herbstii has been observed in flower year-round in January, May, July, September, and October (Service 1998b).

Historically, *Chamaesyce herbstii* was known from scattered populations in the northern and central Waianae Mountains on the island of Oahu. Currently, this species is known from four populations with between 162 and 164 individuals in the central and northern Waianae Mountains—South Ekahanui Gulch, Pahole (Kukuiula) Gulch, Kapuna Gulch, and West Makaleha-Central Makaleha. These populations are found on private and State lands (HINHP Database 2001; Geographic Decision Systems International (GDSI) 2001).

Chamaesyce herbstii typically grows in shaded gulch bottoms and slopes in mesic *Acacia koa/Metrosideros polymorpha* lowland forests or diverse mesic forests at elevations between 435 and 886 m (1,427 and 2,906 ft). Associated plant species include *Xylosma* sp. (maua), *Pteralyxia* sp. (kaulu), *Morinda trimera* (noni), *Hedyotis* sp., *Coprosma* sp., *Pipturis albidus, Diplazium sandwichianum* (hoio), *Antidesma platyphyllum, Hibiscus arnottianus* var. *arnottianus* (kokio keokeo), *Melicope* sp. (alani), *Pouteria sandwicense* (alaa), or *Urera glabra* (opuhe) (HINHP Database 2001; EDA, *in litt.* 2001).

The primary threats to *Chamaesyce herbstii* are habitat degradation and/or destruction by feral pigs; competition with alien plant species such as *Clidemia hirta, Grevillea robusta, Passiflora suberosa, Psidium cattleianum,* and *Schinus terebinthifolius;* potential fire; and a risk of extinction from naturally occurring events (such as hurricanes) and/or reduced reproductive vigor due to the small number of remaining populations (HINHP Database 2001; 61 FR 53089; Service 1998b).

Chamaesyce kuwaleana (Akoko)

Chamaesyce kuwaleana, a member of the spurge family (Euphorbiaceae) and a short-lived perennial, is an erect shrub 20 to 90 cm (8 to 36 in) tall with leaves arranged in two rows along the stem. This species is distinguished from other species of the genus in its habitat by its stalked, oval to rounded leaves with untoothed margins, and the bent stalk supporting the small capsule (Koutnik and Huft 1999).

Chamaesyce kuwaleana bear fruits in spring and early summer and is usually done fruiting by fall. No further information is available on reproductive cycles, specific environmental requirements, or limiting factors (56 FR 55770).

Historically, *Chamaesyce kuwaleana* was known from the central Waianae Mountains and Moku Manu Island off the eastern coast of Oahu. This species is currently known only from Kauaopuu Peak, Mauna Kuwale, Waianae Kai-Lualualei Ridge, Puu Kailio, and Kauaopuu in the Waianae Mountains, on Federal and State lands. The four populations contain around 2,001 individuals (HINHP Database 2001; Koutnik and Huft 1999; GDSI 2001).

Chamaesyce kuwaleana typically grows in thin guano soil on basaltic rock, on arid, exposed volcanic cliffs, on dry or mesic rocky ridges, or on sparsely vegetated slopes between sea level and 596 m (0 to 1,955 ft) elevation. Associated species include *Heteropogon contortus, Bidens* sp. (kookoolau), *Artemisia* sp. (hinahina), *Plectranthus parviflorus* (ala ala wai nui), *Chamaesyce* sp. (akoko), *Schiedea* sp. (NCN), *Carex* sp. (NCN), *Sida fallax,* or *Dodonaea viscosa* (HINHP Database 2001; Koutnik and Huft 1999; Service 1998b).

The major threats to *Chamaesyce kuwaleana* are competition from the alien plant species *Leucaena leucocephala, Opuntia* sp. (prickly pear), *Cenchrus ciliaris* (buffelgrass), *Schinus terebinthifolius, Kalanchoe pinnata,* and *Melinis repens;* fire; two-spotted leafhoppers (*Saphonia rufofascia*); and the small number of populations (56 FR 55770; Service 1998b; HINHP Database 2001).

Chamaesyce rockii (Akoko)

Chamaesyce rockii, a member of the spurge family (Euphorbiaceae) and a short-lived perennial, is usually a compact shrub or sometimes a small tree typically ranging from 0.5 to 2 m (1.6 to 6.6 ft) tall, but in protected sites it has been known to reach 4 m (13 ft) in height. This species differs from others in the genus in that it has large, red, capsular fruit (Koutnik and Huft 1999).

Chamaesyce rockii has been observed fruiting in February. No other information is available on reproductive cycles, longevity, specific environmental requirements, or limiting factors (Service 1998b).

Chamaesyce rockii was known historically from scattered populations along the Koolau Mountains on the island of Oahu. Today, 16 populations are located in Waikakalaua Gulch, Kaukonahua-Kahana summit area, Punaluu-Kaluanui, Peahinaia Trail Laie-Kaipapau-Kawai Nui junction area, Puu Keahiakahoe, Halawa Trail, summit ridge between Aiea Ridge Trail and Waimano Trail, Ewa Forest Reserve, Halemano Gulch, Kawaiiki-Opaeula Ridge, Puu Kainapuaa, Kawai Iki Stream, Maakua Gulch, and Kaipapau-Loloa Ridge, on State, Federal, and private lands. Currently the total number of plants is estimated to be between 641 and 773 plants (HINHP Database 2001; EDA Database 2001; GDSI 2001).

Chamaesyce rockii typically grows on gulch slopes, gulch bottoms, and ridge crests in wet *Metrosideros polymorpha-Dicranopteris linearis* (uluhe) forest and shrubland between 208 and 871 m (682 and 2,857 ft) in elevation. Associated plant species include *Bidens* sp., *Antidesma platyphyllum, Hedyotis terminalis, Psychotria* spp. (kopiko), *Melicope* spp., *Coprosma longifolia* (pilo), *Diplopterygium pinnatum* (uluhe lau nui), *Cibotium* sp. (hapuu),

Broussaisia arguta, Dubautia laxa (naenae pua melemele), *Machaerina* sp., *Psychotria fauriei* (kopiko), *Wikstroemia* sp. (akia), or the endangered species *Myrsine juddii* (kolea) (HINHP Database 2001).

The primary threats to *Chamaesyce rockii* are habitat degradation and/or destruction by feral pigs; trail clearing; potential impacts from military activities; and competition with alien plant species such as *Paspalum conjugatum, Pterolepis glomerata* (NCN), *Leptospermum scoparium* (tea tree), *Psidium cattleianum,* and *Clidemia hirta* (HINHP Database 2001; 61 FR 53089; Service 1998b).

Cyanea acuminata (Haha)

Cyanea acuminata, a member of the bellflower family (Campanulaceae) and a short-lived perennial, is an unbranched shrub 0.3 to 2 m (1 to 6.6 ft) tall with inversely lance-shaped to narrowly egg-shaped or elliptic leaves. This species is distinguished from others in this endemic Hawaiian genus by the color of the petals and fruit and length of the calyx lobes, flowering stalk, and leaf stalks (Lammers 1999).

Cyanea acuminata has been observed fruiting in February and November. No other information is available on reproductive cycles, longevity, specific environmental requirements, or limiting factors (Service 1998b).

Historically, *Cyanea acuminata* was known from 31 scattered populations in the Ko olau Mountains of Oahu. Currently, fewer than 200 plants are known from 22 populations on private, city, county, State, and Federal lands on Puu o Kona, near South Kaukonahua Stream, in Halemano Gulch, Kawai Iki Gulch, near Poamoho Stream, on Schofield-Wai Kane Trail, Helemano-Punaluu summit ridge, Konahuanui, in Kamana Nui Valley, Pukele, in Makaua Gulch, on Niu-Waimanalo summit ridge, Waahila Ridge, Kaipapau, Puu Keahia Kahoe, Kaala, Kaluanui, Pia Gulch, Makaleha, and Maakua Gulch (HINHP Database 2001; GDSI 2001; EDA Database 2001).

Cyanea acuminata typically grows on slopes, ridges, or stream banks between 216 and 1,208 m (708 and 3,962 ft) elevation. The plants are found in *Metrosideros polymorpha-Dicranopteris linearis, Acacia koa-Metrosideros polymorpha* wet or mesic forest or shrubland, or *Diospyros sandwicensis-Metrosideros polymorpha* lowland mesic forest with one or more of the following associated native species *Hibiscus* sp. (aloalo), *Charpentiera* sp. (papala), *Cyrtandra* spp. (hai wale), *Antidesma* sp. (hame), *Freycinetia arborea* (ieie), *Athyrium sandwichianum, Psychotria* sp., *Hedyotis* sp., *Perrottetia sandwicensis, Melicope* spp., *Thelypteris sandwicensis* (palapalaia), *Hedyotis centranthoides* (NCN), *Broussaisia argutus, Pipturus albidus, Labordia* sp. (kamakahala), *Chamaesyce* sp., *Pisonia* sp., *Touchardia latifolia* (olona), *Machaerina* sp., *Sadleria* sp. (amau), *Wikstroemia* sp., *Dubautia laxa, Ilex anomala, Syzygium sandwicensis* (ohia ha), or *Phyllostegia* sp. (HINHP Database 2001; Lammers 1999).

The major threats to *Cyanea acuminata* are habitat degradation and/or destruction by feral pigs; potential impacts from military activities; potential predation by rats (*Rattus rattus*); competition with the alien plant species *Aleurites moluccana, Cordyline fruticosa* (ti), *Schinus terebinthifolius, Musa* sp., (banana), *Passiflora suberosa, Dioscorea* sp. (yam), *Erigeron karvinskianus* (daisy fleabane), *Rubus argutus, Schinus terebinthifolius, Clidemia hirta,* and *Ageratina adenophora* (Maui pamakani); and a risk of extinction from naturally occurring events and/or reduced reproductive vigor due to the small number of remaining individuals (HINHP Database 2001; 61 FR 53089; Service 1998b).

Cyanea crispa (Haha)

Cyanea crispa, a member of the bellflower family (Campanulaceae) and a short-lived perennial, is an unbranched shrub with leaves clustered at the ends of succulent stems. The broad oval leaves, 30 to 75 cm (12 to 30 in) long and 9 to 16 cm (3.5 to 6.3 in) wide, have undulating, smooth or toothed leaf margins. Each leaf is on a stalk 0.8 to 4 cm (0.3 to 1.6 in) long. Clusters of three to eight fuzzy flowers grow on stalks 2 to 3 cm (0.8 to 1.2 in) long, with each flower borne on a stalk 1 to 2 cm (0.4 to 0.8 in) long. The calyx lobes are oval or oblong, 6 to 12 mm (0.2 to 0.5 in) long, and often overlapping at their base. The fused petals, 4 to 6 cm (1.6 to 2.4 in) long and fuzzy, are pale magenta with darker longitudinal stripes. The fruits are spherical berries 1 cm (0.4 in) in diameter, that contain many minute, dark seeds. *Cyanea crispa* is distinguished from other species in this endemic Hawaiian genus by its leaf shape, distinct calyx lobes, and the length of the flowers and stalks of flower clusters (Lammers 1999).

Cyanea crispa was observed in flower in April 1930. It was more recently observed fruiting in June and September. No further information is available on reproductive cycles, longevity, specific environmental requirements, or limiting factors (Service 1998b; 59 FR 14482).

Historically, *Cyanea crispa* was known from scattered locations throughout the upper elevations of the Koolau Mountains of Oahu from Kaipapau Valley to the north to Waialae Iki Ridge to the southeast. This species is now known from Federal, State, city, county, and private lands in Hidden Valley, Palolo Valley, Kapakahi Gulch, Moanalua Valley, Wailupe, Koolau Summit Trail, Kawaipapa Gulch, Maakua Gulch, Kaipapa Gulch, Maunawili, and Pia Valley. There are a total of 11 locations containing a total of 56 individual plants (HINHP Database 2001; EDA Database 2001).

Cyanea crispa is found in habitats ranging from steep, open mesic forests to gentle slopes or moist gullies of closed wet forests and streambanks, at elevations between 56 and 959 m (184 and 3,146 ft). Associated plant species include *Diospyros* sp. (lama), *Pipturus albidus, Cibotium chamissoi, Perrottetia sandwicensis, Metrosideros polymorpha, Boehmeria grandis* (akolea), *Broussaisia argutus, Dubautia* sp. (naenae), *Psychotria* sp., *Thelypteris cyatheoides* (palapalai), *Antidesma platyphylla, Cyrtandra* spp., *Pisonia umbellifera* (papala kepau), or *Touchardia latifolia* (HINHP Database 2001; Service 1998b).

The major threats to *Cyanea crispa* are habitat alteration and predation by feral pigs; competition with the alien plant species *Zingiber zerumbet* (awapuhi), *Setaria palmifolia* (palm grass), *Arthrostema ciliatum* (NCN), *Psidium guajava, Pterolepis glomerata, Schinus terebinthifolius, Rubus rosifolius* (thimbleberry), *Clidemia hirta,* and *Psidium cattleianum;* and extinction due to naturally occurring events and/or reduced reproductive vigor due to the small number of remaining individuals, their limited gene pool, and restricted distribution (Service 1998b; 59 FR 14482).

Cyanea grimesiana ssp. *obatae* (Haha)

Cyanea grimesiana ssp. *obatae,* a member of the bellflower family (Campanulaceae) and a short-lived perennial, is a shrub, usually unbranched, growing from 1 to 3.2 m (3.3 to 10.5 ft) tall with wide, deeply lobed leaves. This subspecies can be distinguished from the other two by its short, narrow, calyx lobes which are not fused or overlapping (Lammers 1999).

Cyanea grimesiana ssp. *obatae* flowers and fruits year round, depending on rainfall. No further information is available on reproductive cycles, specific environmental

requirements, or limiting factors (59 FR 32932).

Historically, *Cyanea grimesiana* ssp. *obatae* was known from the southern Waianae Mountains from Puu Hapapa to Kaaikukai. This taxon is known to be extant in Kaluaa Gulch, Ekahanui Gulch, North Palawai Gulch, and Pahole Gulch. The populations are on State and private lands. A total of six populations are known which contain 16 individuals (HINHP Database 2001; Lammers 1999; GDSI 2000).

Cyanea grimesiana ssp. *obatae* typically grows on steep, moist, shaded slopes in diverse mesic to wet lowland forests between 404 and 1,075 m (1,325 and 3,528 ft) elevation. Associated species include *Pouteria sandwicensis, Psychotria hathewayi* (kopiko), *Streblus pendulinus* (aiai), *Perrottetia sandwicensis, Dubautia* sp., *Rumex* sp. (sorrel), *Chamaesyce* sp., *Coprosma* sp., *Nothocestrum* sp. (aiea), *Dryopteris unidentata* (NCN), *Freycinetia arborea, Cibotium chamissoi, Myrsine lessertiana* (kolea lau nui), *Hedyotis terminalis, Hedyotis acuminata* (au), *Selaginella arbuscula* (lepelepe a moa), *Charpentiera obovata* (papala), *Cyrtandra waianaeensis* (hai wale), *Pipturus albidus, Claoxylon sandwicense* (poola), *Pisonia umbellifera, Acacia koa, Metrosideros polymorpha, Antidesma platyphyllum, Diplazium sandwichianum,* or *Cyanea membranacea* (haha) (HINHP Database 2001; EDA, *in litt.* 2001; Lammers 1999).

The major threats to *Cyanea grimesiana* ssp. *obatae* are habitat degradation by feral pigs; competition from alien plant species such as *Buddleia asiatica, Passiflora suberosa, Blechnum occidentale, Thelypteris parasitica* (NCN), *Psidium cattleianum, Aleurites moluccana, Toona ciliata, Setaria palmifolia, Rubus rosifolius, Lantana camara* (lantana), *Myrica faya* (firetree), *Ageratina riparia, Paspalum conjugatum, Clidemia hirta,* and *Schinus terebinthifolius;* predation of seeds or fruits by introduced slugs; and extinction caused by naturally occurring events and/or reduced reproductive vigor due to the small number of extant individuals (HINHP Database 2001; 59 FR 32932; Service 1998b).

Cyanea humboltiana (Haha)

Cyanea humboltiana, a member of the bellflower family (Campanulaceae) and a short-lived perennial, is an unbranched shrub with woody stems 1 to 2 m (3.2 to 6.6 ft) tall and inversely egg-shaped to broadly elliptic leaves. The leaf edges are hardened and have shallow, ascending rounded teeth. This species differs from others in this endemic Hawaiian genus by the downward bending flowering stalk and the length of the flowering stalk (Lammers 1999).

Cyanea humboltiana has been observed in flower from September through January. No further information exists on reproductive cycles, longevity, specific environmental requirements, or limiting factors (Service 1998b).

Cyanea humboltiana was known historically from 17 populations from the central portion to the southern end of the Koolau Mountains of Oahu. Currently, between 133 and 239 plants are known from eight locations Konahuanui summit, Moanalua-Kaneohe summit, Wailupe summit, Poamoho Trail, Opaeula Gulch, Maakua Gulch, Kaluanui, and Lulumahu Gulch. These populations occur on Federal, private, State, city, and county lands (HINHP Database 2001; GDSI 2001; EDA Database 2001).

Cyanea humboltiana is usually found in wet *Metrosideros polymorpha/ Dicranopteris linnearis* lowland shrubland between 261 and 959 m (856 and 3,146 ft) elevation. Associated native plant species include ferns, *Hedyotis terminalis, Dubautia laxa, Cibotium chamissoi, Syzygium sandwicensis, Acacia koa, Psychotria mariniana* (kopiko), *Bobea elatior* (ahakea), *Sadleria* sp., *Wikstroemia* sp., *Broussaisia argutus, Phyllostegia* sp., *Melicope* sp., *Machaerina angustifolia* (uki), *Ilex anomala,* or *Scaevola mollis* (naupaka kuahiwi) (HINHP Database 2001).

The major threats to *Cyanea humboltiana* are habitat degradation and/or destruction by feral pigs; potential predation by rats; competition with the alien plant species *Axonopus fissifolius* (narrow-leaved carpet grass), *Erigeron karvinskianus, Pterolepis glomerata, Psidium cattleianum,* and *Clidemia hirta;* and a risk of extinction from naturally occurring events and/or reduced reproductive vigor, due to the small number of remaining populations. The Konahuanui summit population is also threatened by trampling by hikers (HINHP Database 2001; 61 FR 53089; Service 1998b).

Cyanea koolauensis (Haha)

Cyanea koolauensis, a member of the bellflower family (Campanulaceae) and a short-lived perennial, is an unbranched shrub with woody stems, 1 to 1.5 m (3.5 to 5 ft) tall with linear to narrowly elliptic leaves with a whitish underside. The leaf edges are hardened with shallow, ascending rounded teeth. *Cyanea koolauensis* is distinguished from others in this endemic Hawaiian genus by the leaf shape and width; the whitish green lower leaf surface and; the lengths of the leaf stalks, calyx lobes, and hypanthium (Lammers 1999).

Cyanea koolauensis has been observed in flower and fruit during the months of May through August. No other information is available on reproductive cycles, longevity, specific environmental requirements, or limiting factors (Service 1998b).

Cyanea koolauensis was known historically from 27 scattered populations throughout the Koolau Mountains on Oahu. Currently, 25 populations totaling fewer than 80 plants are known from the Waimea-Malaekahana Ridge to Hawaii Loa Ridge in the Koolau Mountains. These populations occur on private, city, county, State, and Federal lands (HINHP Database 2001; GDSI 2001; EDA Database 2001).

Cyanea koolauensis is usually found on slopes, streambanks, and ridge crests in wet *Metrosideros polymorpha-Dicranopteris linearis* forest or shrubland at elevations between 163 and 959 m (535 and 3,146 ft). Associated plant species include *Acacia koa, Bobea elatior, Syzygium sandwicensis, Pittosporum* sp. *Dubautia* sp., *Cibotium* sp., *Hedyotis* sp., *Wikstroemia* sp., *Bidens* sp., *Machaerina* sp., *Diplaterygium pinnatum, Pritchardia martii* (loulu hiwa), *Sadleria* sp., *Broussaisia argutus, Melicope* sp., *Antidesma platyphyllum, Psychotria mariniana,* or *Scaevola* sp. (naupaka) (HINHP Database 2001; Lammers 1999).

The major threats to *Cyanea koolauensis* are habitat destruction by feral pigs; potential impacts from military activities; trail clearing, potential predation by rats; competition with the aggressive alien plant species *Pterolepis glomerata, Heliocarpus popayanensis* (moho), *Clidemia hirta,* and *Psidium cattleianum;* trampling by hikers; and a risk of extinction from naturally occurring events and/or reduced reproductive vigor due to the small number of remaining individuals (HINHP Database 2001; 61 FR 53089; Service 1998b).

Cyanea longiflora (Haha)

Cyanea longiflora, a member of the bellflower family (Campanulaceae) and a short-lived perennial, is an unbranched shrub with woody stems 1 to 3 m (3.5 to 10 ft) long and elliptic or inversely lance-shaped leaves. Mature leaves have smooth or hardened leaf edges with shallow, ascending, rounded teeth. *Cyanea longiflora* differs from others in this endemic Hawaiian genus by the fused calyx lobes (Lammers 1999).

Cyanea longiflora has been observed in flower in February, April, and May and in fruit in August. No further information is available on reproductive cycles, longevity, specific environmental requirements, or limiting factors (Service 1998b).

Cyanea longiflora was known historically from five populations in the Waianae Mountains and six populations in the Koolau Mountains of Oahu. Currently, four populations with less than 217 individuals of this species are known on State, Federal, city, county, and private lands Makaha-Waianae Kai Ridge, Makaha Valley, Kapuna Gulch, and Pahole Gulch in the Waianae Mountains (Service 1998b; HINHP Database 2001; GDSI 2001).

Cyanea longiflora is usually found on steep slopes, bases of cliffs, or ridge crests in mesic *Acacia koa-Metrosideros polymorpha* lowland forest in the Waianae Mountains usually between 221 and 1,191 m (725 and 3,906 ft) elevation. Associated plant species include *Cibotium* sp., *Schiedea* sp., *Psychotria* sp., *Antidesma* sp., *Dicranopteris linearis, Coprosma* sp., or *Syzygium sandwicensis* (HINHP Database 2001; Lammers 1999).

The major threats to *Cyanea longiflora* are habitat degradation and/or destruction by feral pigs; potential impacts from military activities; potential predation by rats; competition with the alien plant species *Psidium cattleianum* and *Rubus argutus;* potential fire; and a risk of extinction from naturally occurring events and/or reduced reproductive vigor due to the small number of remaining, widely dispersed populations (HINHP Database 2001; 61 FR 53089; Service 1998b).

Cyanea pinnatifida (Haha)

Cyanea pinnatifida, a member of the bellflower family (Campanulaceae) and a short-lived perennial, is a shrub, usually unbranched, growing from 0.8 to 3.0 m (2.6 to 10 ft) tall, with deeply lobed leaves. This species differs from other members of the genus on Oahu by its leaves, which are deeply cut into two to six lobes per side. The only other member of the genus on Oahu with lobed leaves has 9 to 12 lobes per side (Lammers 1999).

Cyanea pinnatifida has been observed flowering in August. No further information is available on reproductive cycles, longevity, specific environmental requirements, or limiting factors (Service 1998b).

Historically, *Cyanea pinnatifida* was known from the central Waianae Mountains. The last known wild individual died in August 2001 (Trae Menard, TNCH, pers. comm., 2001; HINHP Database 2001; Lammers 1999). Currently, this species is known only from individuals under propagation at the University of Hawaii's Lyon Arboretum and the National Tropical Botanical Garden (Greg Koob, Service, pers. comm. 2002).

Cyanea pinnatifida typically grows on steep, wet, rocky slopes in diverse mesic forest between 450 and 881 m (1,476 and 2,890 ft) elevation. Associated plant species include *Strongylodon ruber* (nunuiiwi), *Pisonia umbellifera, Pisonia sandwicensis* (papala kepau), *Psychotria* sp., *Canavalia* sp. (awikiwiki), *Diplazium sandwichianum, Pipturus albidus,* and native ferns (HINHP Database 2001; Lammers 1999).

The major threats to *Cyanea pinnatifida* are the small number of extant individuals; competition from the alien plant species *Toona ciliata, Passiflora suberosa, Aleurites moluccana, Psidium cattleianum, Psidium guajava, Blechnum occidentale, and Clidemia hirta;* habitat degradation by feral pigs; slugs; trampling by humans on or near trails; and a risk of extinction from naturally occurring events and/or reduced reproductive vigor due to the small number of remaining individuals (56 FR 55770; Service 1998b).

Cyanea st-johnii (Haha)

Cyanea st-johnii, a member of the bellflower family (Campanulaceae) and a short-lived perennial, is an unbranched shrub with a woody stem 30 to 60 cm (12 to 24 in) long with lance-shaped to inversely lance-shaped leaves. The leaf edges are thickened, smoothly toothed, and curl under. This species is distinguished from others in this endemic Hawaiian genus by the length of the leaves, the distinctly curled leaf margins, and the petal color (Lammers 1999).

Cyanea st-johnii has been observed in flower in July through September. No further information is available on reproductive cycles, longevity, specific requirements, or limiting factors (Service 1998b).

Cyanea st-johnii was known historically from 11 populations in the central and southern Koolau Mountains of Oahu. Currently, 57 plants are known from six locations Waimano Trail summit to Aiea Trail summit, the summit ridge crest between Manana and Kipapa Trails, between the summit of Aiea and Halawa trails, Summit Trail south of Poamoho Cabin, and Wailupe-Waimanalo summit ridge. These populations are found on city, county, private, and State lands, and lands under Federal jurisdiction (HINHP Database 2001; GDSI Database 2000).

Cyanea st-johnii typically grows on wet, windswept slopes and ridges between 415 and 959 m (1,361 and 3,146 ft) elevation in *Metrosideros polymorpha* mixed lowland shrubland or *Metrosideros polymorpha-Dicranopteris linearis* lowland shrubland. Associated plant species include *Psychotria* sp., *Alyxia oliviformis, Melicope* sp., *Broussaisia argutus, Cibotium* sp., *Labordia* sp., *Scaevola mollis, Dubautia laxa, Hedyotis* sp., *Antidesma* sp., *Sadleria pallida (amau), Syzygium sandwicensis, Machaerina angustifolia, Bidens macrocarpa* (kookoolau), *Chamaesyce clusifolia* (akoko), or *Freycinetia arborea* (HINHP Database 2001).

The major threats to *Cyanea st-johnii* are habitat degradation and/or destruction by feral pigs; potential predation by rats; slugs and snails; competition with the alien plant species *Axonopus fissifolius, Sacciolepis indica* (Glenwood grass), *Andropogon virginicus* (broomsedge), and *Clidemia hirta;* and a risk of extinction from naturally occurring events and/or reduced reproductive vigor due to the small number of remaining populations and individuals. The plants between the summit of Aiea and Halawa Trail are also threatened by trampling by hikers (HINHP Database 2001; 61 FR 53089; Service 1998b).

Cyanea superba (Haha)

Cyanea superba, of the bellflower family (Campanulaceae) and a short-lived perennial, is a perennial with a very isolated geography and is morphologically very different from its closest relatives. It grows to 6 m (20 ft) tall and has a terminal rosette of large leaves each 50 to 100 cm long (20 to 40 in) by 10 to 20 cm (4 to 8 in) wide atop a simple, unbranched trunk (Lammers 1999).

The flowering season of *Cyanea superba* varies from year to year depending on precipitation. It ranges from late August to early October. Generally, flowering is at its peak in early to mid-September. Fruits have been known to mature in 2 to 5 months, depending on climatic conditions (Service 1998b).

Historically, *Cyanea superba* was collected from the gulches of Makaleha on Mt. Kaala in the Waianae Mountains of Oahu. Currently, there is one natural population on the Makua Military Reservation with one individual and an out-planted population of 140 individuals on State and Federal lands in the Waianae Mountains (Service 1998b; Matt Keir, EDA, pers. comm., 2001; HINHP Database 2001; GDSI 2001; EDA Database 2001).

Cyanea superba grows in the understory on sloping terrain on a well drained rocky substrate within mesic forest between 232 and 872 m (761 and 2,860 ft) in elevation with one or more of the following associated native species *Diospyros* sp., *Metrosideros polymorpha, Xylosma* sp., *Nestegis sandwicensis, Psychotria* sp., *Hedyotis terminalis,* and *Pisonia brunoniana* (papala kepau) (HINHP Database 2001).

The major threats to *Cyanea superba* are degradation of its habitat due to competition with the alien plant species *Schinus terebinthifolius, Aleurites moluccana., Psidium cattleianum,* and *Melinis minutiflora;* wildfires generated in the nearby military firing range; feral pigs; a restricted range which makes it vulnerable to even a small, local, environmental disturbance and a single incident which could destroy a significant percentage of the known individuals; and the limited gene pool may depress reproductive vigor (56 FR 46235; Service 1998b; HINHP Database 2001).

Cyanea truncata (Haha)

Cyanea truncata, of the bellflower family (Campanulaceae) and a short-lived perennial, is an unbranched or sparsely branched shrub covered with small sharp prickles and oval leaves, which are wider above their middle, and lined with hardened teeth along the margins. *Cyanea truncata* is distinguished from other members of this genus by the length of the flower cluster stalk, and the size of the flowers and flower lobes (Lammers 1999).

Cyanea truncata was observed in flower in December 1919 and November 1980, the last time the species was observed before feral pigs extirpated that population. No other information exists on reproductive cycles, longevity, specific environmental requirements, or limiting factors (Service 1998b; 59 FR 14482).

Historically, *Cyanea truncata* was known from Punaluu, Waikane, and Waiahole in the northern Koolau Mountains of Oahu. One population of at least one individual is known to exist in Hanaimoa Gulch on State and private lands (HINHP Database 2001; GDSI 2001).

Cyanea truncata typically grows on windward slopes and streambanks in mesic to wet forests at elevations between 54 and 705 m (177 and 2,312 ft). Associated plant species include *Cyrtandra calpidicarpa* (hai wale), *Cyrtandra laxiflora* (hai wale), *Pipturus albidus, Cibotium chamissoi, Hibiscus arnottianus, Diospyros sandwicensis, Metrosideros polymorpha, Cyrtandra propinqua* (hai wale), *Neraudia melastomifolia* (maaloa), or *Pisonia umbellifera* (Service 1998b; HINHP Database 2001; Lammers 1999).

The major threats to *Cyanea truncata* are habitat degradation and predation by feral pigs; competition with the invasive alien plant species *Cordyline fruticosa, Oplismenus hirtellus, Thelypteris parasitica, Clidemia hirta,* and *Psidium cattleianum;* rats; slugs; and extinction due to naturally caused events and/or reduced reproductive vigor due to the small number of remaining individuals (59 FR 14482; Service 1998b).

Cyrtandra crenata (Haiwale)

Cyrtandra crenata, a member of the African violet family (Gesneriaceae) and a short-lived perennial, is a shrub 1 to 2 m (3 to 7 ft) tall with few branches and leaves arranged in whorls of three, tufted at the end of branches. *Cyrtandra crenata* is distinguished from other species in the genus by the combination of its three-leaf arrangement, bilaterally symmetrical calyx, and brownish, hemispherical glands (Wagner *et al.* 1999).

Cyrtandra crenata has been observed in flower in June. No other information exists on reproductive cycles, longevity, specific environmental requirements, and limiting factors (Service 1998b; 59 FR 14482).

Historically, *Cyrtandra crenata* was known from Waikane Valley along the Waikane-Schofield Trail in the Koolau Mountains and was last observed in 1947 (HINHP Database 2001).

Cyrtandra crenata typically grows on steep slopes, in ravines, or gulches in mesic to wet forests between elevations of 328 and 779 m (1,076 and 2,555 ft) with associated native plant species such as *Metrosideros polymorpha, Dicranopteris linearis,* and *Machaerina angustifolia* (Wagner *et al.* 1999; Service 1998b; HINHP Database 2001).

The primary threat to *Cyrtandra crenata* is extinction due to naturally caused events and/or reduced reproductive vigor due to the species' restricted range and the small number of individuals that are thought to exist (59 FR 14482; Service 1998b).

Cyrtandra dentata (Haiwale)

Cyrtandra dentata, a member of the African violet family (Gesneriaceae) and a short-lived perennial, is a sparingly branched shrub ranging from 1.5 to 5 m (5 to 16 ft) tall with papery textured leaves. This species is distinguished from others in the genus by the number and arrangement of the flowers, the length of the bracts and flower stalks, and the shape of the leaves (Wagner *et al.* 1999).

Cyrtandra dentata has been observed in flower and fruit in May and November. No other information exists on reproductive cycles, longevity, specific environmental requirements, and limiting factors (Service 1998b).

Cyrtandra dentata was historically known from six populations in the Waianae Mountains and three populations in the Koolau Mountains of Oahu. Currently, this species is found only in the Pahole Gulch, Kapuna Valley, Ekahanui Gulch, Keawapilau Gulch, Kahanahaiki, Kawai Iki Gulch, Opaeula Stream, and Makaleha Valley on Federal, State, city, and county lands (within TNCH's Honouliuli Preserve). The eight known populations total 136 individuals (HINHP Database 2001; EDA Database 2001; GDSI 2001).

Cyrtandra dentata typically grows in gulches, slopes, streambanks, or ravines in mesic or wet forest with *Urera glabra, Acacia koa, Pisonia sandwicensis, Pipturis albidus, Metrosideros polymorpha, Pouteria sandwicensis, Pisonia umbellifera,* or *Syzygium sandwicensis* at elevations between 255 and 953 m (836 and 3,126 ft) (HINHP Database 2001; Wagner *et al.* 1999; EDA, *in litt.* 2001).

The major threats to *Cyrtandra dentata* are competition with the alien plant species *Schinus terebinthifolius, Psidium guajava, Aleurites moluccana, Thelypteris parasitica, Belchnum occidentale, Clidemia hirta,* and *Psidium cattleianum;* potential predation by rats; potential fire; and a risk of extinction from naturally occurring events (such as landslides/hurricanes/flooding) and/or reduced reproductive vigor, due to the small number of extant populations and individuals (HINHP Database 2001; 61 FR 53089; Service 1998b).

Cyrtandra polyantha (Haiwale)

Cyrtandra polyantha, a member of the African violet family (Gesneriaceae) and a short-lived perennial, is an unbranched or few-branched shrub 1 to 3 m (3 to 10 ft) in height with leathery, elliptic, unequal leaves. *Cyrtandra polyantha* is distinguished from other species in the genus by the texture and hairiness of the leaf surfaces and the length, shape, and degree of cleft of the calyx. This species differs from *C. crenata* by the lack of short-stalked glands and by its leathery leaves, opposite leaf arrangement, and radially symmetrical calyx (Wagner *et al.* 1999).

No information exists on reproductive cycles, longevity, specific environmental requirements, and limiting factors for *Cyrtandra polyantha* (Service 1998b).

Historically, *Cyrtandra polyantha* was known from the Kalihi region and from Kūlepeamoa Ridge above Niu Valley on the leeward (southwest) side of the southern Koolau Mountains. Currently, one population with three individuals is extant on the summit ridge between Kuliouou and Waimanalo on State and private lands (HINHP Database 2001).

Cyrtandra polyantha grows on ridges of valleys in *Metrosideros polymorpha* mesic or wet forests at elevations between 331 and 762 m (1,086 and 2,499 ft). *Cyrtandra polyantha* probably grows in association with *Machaerina angustifolia, Dicranopteris linearis, Broussaisia arguta, Coprosma foliosa* (pilo), and *Psychotria* sp. (Service 1998b; HINHP Database 2001).

The primary threats to *Cyrtandra polyantha* are habitat degradation by feral pigs; competition with the invasive plant species, *Clidemia hirta, Melinus minutiflora, Ageratina adenophora,* and *Erigeron karvinskianus;* extinction due to naturally caused events and/or reduced reproductive vigor due to the small number of remaining individuals and their restricted distribution (59 FR 14482; Service 1998b; HINHP Database 2001).

Cyrtandra subumbellata (Haiwale)

Cyrtandra subumbellata, a member of the African violet family (Gesneriaceae) and a short-lived perennial, is a shrub 2 to 3 m (6.6 to 10 ft) tall. Papery in texture, the leaves are almost circular to egg-shaped, 12 to 39 cm (4.7 to 15.4 in) long, and 3 to 19 cm (1.2 to 7.5 in) wide (Wagner *et al.* 1999).

Cyrtandra subumbellata has been observed in fruit in September. No other information is available on reproductive cycles, longevity, specific environmental requirements, or limiting factors (Service 1998b).

Historically, *Cyrtandra subumbellata* was known from the Koolau Mountains of Oahu. Currently, there are two populations containing 12 individuals in the central Koolau Mountains Schofield-Waikane Trail, Puu Ohulehule, and in Kaukonahua drainage on Federal, private, and State lands (HINHP Database 2001; EDA Database 2001).

Cyrtandra subumbellata typically grows on moist, forested slopes or gulch bottoms dominated by *Metrosideros polymorpha* or a mixture of *Metrosideros polymorpha-Dicranopteris linearis-Acacia koa* wet forests between 345 and 790 m (1,132 and 2,591 ft) elevation. Associated plant species include *Machaerina* sp., *Boehmeria grandis, Broussaisia arguta,* and *Thelypteris* sp. (palapalai) (HINHP Database 2001; Service 1998b; Wagner *et al.* 1999).

The primary threats to *Cyrtandra subumbellata* are competition with the alien plant species Clidemia hirta; impacts from military activities; predation by rats; fire; and risk of extinction from naturally occurring events and/or reduced reproductive vigor due to the small number of extant populations and individuals (HINHP Database 2001; Service 1998b; 61 FR 53089).

Cyrtandra viridiflora (Haiwale)

Cyrtandra viridiflora, a member of the African violet family (Gesneriaceae) and a short-lived perennial, is a small shrub 0.5 to 2 m (1.6 to 6.6 ft) tall. This species is distinguished from others in the genus by the leaves, which are thick, fleshy, heart-shaped, and densely hairy on both surfaces (Wagner *et al.* 1999).

Cyrtandra viridiflora has been observed in fruit and flower from May through September. No other information is available on reproductive cycles, longevity, specific environmental requirements, or limiting factors (Service 1998b).

Historically, *Cyrtandra viridiflora* was known from scattered populations in the Koolau Mountains on the island of Oahu. This species is now known only from seven locations in the northern Koolau Mountains on Federal, State, and private lands at Kawainui-Laie summit divide, Kawainui-Kaipapau summit divide, Maakua-Kaipapau Ridge, and the Peahinaia Trail. Fifty-two plants are known from eight populations at Puu Kainapuaa, Maakua-Kaipapau Ridge, Kawai Nui Drainage, Opaeula Gulch, and Kawai Nui-Laie Divide (HINHP Database 2001; GDSI 2001).

Cyrtandra viridiflora is usually found on wind-blown ridge tops in cloud-covered wet forest or shrubland at elevations between 443 and 867 m (1,453 and 2,844 ft). Associated plant species include *Diplopterygium* (pinnatum), *Psychotria* sp., *Freycinetia arborea, Dubautia* sp., *Ilex anomala, Melicope* sp., *Hedyotis* sp., *Cheirodendron platyphyllum* (olapa), *Broussaisia arguta, Metrosideros polymorpha, Syzygium sandwicensis, Machaerina* sp., *Metrosideros rugosa* (lehua papa), or *Dicranopteris linearis* (HINHP Database 2001; Wagner *et al.* 1999; EDA, *in litt.* 2001).

The major threats to *Cyrtandra viridiflora* are habitat degradation or destruction by feral pigs; impacts from military activities, predation by rats, competition with the alien plant species *Clidemia hirta* and *Psidium catteianum;* and risk of extinction from naturally occurring events and/or reduced reproductive vigor due to the small number of remaining populations and individuals (HINHP Database 2001; Service 1998b; 61 FR 53089).

Delissea subcordata (NCN)

Delissea subcordata, a member of the bellflower family (Campanulaceae) and a short-lived perennial, is a branched or unbranched shrub 1 to 3 m (3.5 to 10 ft) tall. This species is distinguished from others in this endemic Hawaiian genus by the shape and size of the leaves, the length of the calyx lobes and corolla, and the hairless condition of the anthers (Lammers 1999).

Fertile plants of *Delissea subcordata* have been observed in July. An examination of herbarium specimens show that this plant flowers throughout the year. No other information is available on reproductive cycles, longevity, specific environmental requirements, or limiting factors (Service 1998b).

Historically, *Delissea subcordata* was known from scattered populations in the Waianae and Koolau Mountains of Oahu. A specimen collected by Mann and Brigham in the 1860s and labeled from the island of Kauai is believed to have been mislabeled. *Delissea subcordata* is now known from 18 populations at South Huliwai Gulch, Palikea Gulch, Kaluaa Gulch, South Mohiakea Gulch, Kahanahaiki Valley, Kapuhi Gulch, South Ekahanui Gulch, Waikoekoe Gulch, Pahole Gulch, Kaawa Gulch, North Palawai Gulch, Kealia land section, Kapuna Gulch, Keawapilau Gulch, North Huliwai Gulch, Kuaokala, and Kolekole. This species is found on private, Federal, and State lands. The total number of plants in the 18 remaining populations is estimated to be fewer than 70 (HINHP Database 2001; GDSI 2001; EDA Database 2001).

Delissea subcordata typically grows on moderate to steep gulch slopes in mixed mesic forests between 162 and 1,025 m (531 and 3,362 ft) elevation. Associated plant species include a variety of native trees such as *Acacia koa, Alyxia oliviformis, Hedyotis acuminata, Streblus pendulinus, Diospyros sandwicensis, Psydrax odoratum, Bobea* sp. (ahakea), *Myrsine lanaiensis, Claoxylon sandwicense, Charpentiera obovata, Chamaesyce multiformis* (akoko), *Pouteria sandwicensis, Antidesma* sp., *Metrosideros polymorpha, Pisonia* sp., *Diospyros hillebrandii* (lama), *Nestegis sandwicensis,* or *Psychotria hathewayi* (HINHP Database 2001; Service 1998b).

The major threats to *Delissea subcordata* are habitat degradation and/

or destruction by pigs and goats; impacts from military activities, including road construction and housing development; predation by rats and slugs; competition with the alien plant species *Passiflora suberosa, Blechnum occidentale, Toona ciliata, Syzygium cumini, Oplismenus hirtellus, Pimenta dioica, Grevillea robusta, Melinus minutiflora, Schinus terebinthifolius, Clidemia hirta, Psidium cattleianum,* and *Lantana camara;* fire; and a risk of extinction from naturally occurring events and/or reduced reproductive vigor due to the small number of remaining individuals (HINHP Database 2001; Service 1998b; 61 FR 53089).

Diellia falcata (NCN)

Diellia falcata, in the polypodium family (Polypodiaceae) and a short-lived perennial, grows from a rhizome (underground stem), 1 to 5 cm (0.4 to 2 in) long and 0.5 to 2 cm (0.2 to 0.8 in) in diameter, which is covered with small black or maroon scales. This species is distinguished from others in the genus by the color and texture of its leaf stalk, the venation pattern of its fronds, the color of its scales, its rounded and reduced lower pinnae, and its separate sori arranged on marginal projections (Wagner 1952; Service 1998b).

Diellia falcata hybridizes with *Diellia unisora.* It has been observed with fronds bearing sori (fern spores) year round. No other information is available on reproductive cycles, longevity, specific environmental requirements, or limiting factors (Service 1998b).

Historically, *Diellia falcata* was known from almost the entire length of the Waianae Mountains, from Manini Gulch to Palehua Iki, as well as from the Koolau Mountains of Oahu, from Kaipapau Valley to Aiea Gulch. This species remains in Waieli Gulch, Ekahanui Gulch, Makaleha Valley, Makaha Valley, Palikea Gulch, Makua Valley, Kaimuhole Gulch, Kuaokala-Manini Gulch, Pahole Gulch, Puu Ku Makalii, Kapuna Gulch, Mohiakea Gulch, Waianae Kai, Pualii Gulch, Napepeiauolelo Gulch, Kahanahaiki Valley, Nanakuli-Lualualei Ridge, Makua, Kamaileunu Ridge, Kaluaa Gulch, and Huliwai Gulch on Federal, State, city, county, and private lands. The 29 known locations contain fewer than 6,000 individuals (HINHP Database 2001; EDA Database 2001; GDSI 2001).

Diellia falcata is a terrestrial fern which typically grows in deep shade or open understory on moderate to moderately steep slopes and gulch bottoms in diverse mesic forest between 224 and 953 m (735 and 3,126 ft) elevation. Associated species include *Pisonia sandwicensis, Doodia kunthiana* (NCN), *Dryopteris unidentata, Antidesma* sp., *Nestegis sandwicensis, Alyxia oliviformis, Psydrax odorata, Pipturis* sp., *Metrosideros polymorpha, Freycinetia arborea, Athyrium sandwichianum, Dryopteris unidentata, Nephrolepis exaltata* (kupukupu), *Diospyros hillebrandii, Acacia koa, Elaeocarpus bifidus, Myrsine lanaiensis, Selaginella arbuscula, Carex meyenii* (NCN), *Sophora chrysophylla* (mamane), *Claoxylon sandwicense, Psychotria* sp., *Hibiscus* sp., *Xylosma* sp., *Melicope* sp., *Coprosma foliosa, Asplenium kaulfussii* (NCN), *Nothocestrum* sp., *Charpentiera* sp., *Hedyotis terminalis, Sapindus oahuensis, Diospyros sandwicensis,* or *Pouteria sandwicensis* (HINHP Database 2001).

The major threats to *Diellia falcata* are habitat degradation by feral goats and pigs; competition from the alien plant species *Psidium cattleianum, Syzygium cumini, Schinus terebinthifolius, Passiflora suberosa, Pimenta dioica, Grevillea robusta, Lantana camara, Melinus minutiflora, Heliocarpus popayanensis, Blechnum occidentale, Kalanchoe pinnata, Ageratina riparia, Psidium guajava, Rubus argutus, Thelypteris parasitica, Toona ciliata, Passiflora lingularis* (sweet granadilla), *Aleurites moluccana, Clidemia hirta, Schefflera actinophylla* (octopus tree), and *Paspalum conjugatum;* and fire (Service 1998b; 56 FR 55770; HINHP Database 2001).

Diellia unisora (NCN)

Diellia unisora, a short-lived perennial in the fern family Polypodiaceae, grows from a slender, erect rhizome (underground stem), 0.5 to 3 cm (0.2 to 1.2 in) tall and 0.5 to 1 cm (0.2 to 0.4 in) in diameter, which is covered with the bases of the leaf stalks and a few small black scales. This species is distinguished from others in the genus by a rhizome completely covered by the persisting bases of the leaf stalks, and few, very small scales; by sori mostly confined to the upper pinnae margins; and by delicate fronds gradually and symmetrically narrowing toward the apex (Wagner 1952).

Diellia unisora hybridizes with *Diellia falcata.* Otherwise, little is known about its reproductive cycles, longevity, specific environmental requirements, or limiting factors (Service 1998b).

Historically, *Diellia unisora* was known from steep, grassy, rocky slopes on the western side of the Waianae Mountains, Oahu. This species is known to be extant in four areas of the southern Waianae Mountains at South Ekahanui Gulch, Palawai Gulch, and the Pualii-Napepeiauolelo Ridge. The four known populations, which are on State and private lands, contain fewer than 800 individuals (HINHP Database 2001; GDSI 2001).

Diellia unisora is a terrestrial fern which typically grows on moderate to steep slopes or gulch bottoms in deep shade or open understory mesic forest between 382 and 953 m (1,253 and 3,126 ft) elevation. Associated species include *Coprosma* sp., *Rumex* sp., *Antidesma* sp., *Psychotria* sp., *Carex meyenii, Doryopteris unidentata, Chamaesyce multiformis, Dodonaea viscosa, Bidens torta, Eragrostis grandis* (kawelu), *Hedyotis terminalis, Alyxia oliviformis, Myrsine lessertiana, Hedyotis schlecthendahliana* (kopa), *Selaginella arbuscula, Acacia koa,* or *Metrosideros polymorpha* (59 FR 32932; HINHP Database 2001).

The major threats to *Diellia unisora* are habitat degradation by feral pigs and competition from the alien plant species *Ageratina riparia, Clidemia hirta, Schefflera actinophylla, Blechnum occidentale, Schinus terebinthifolius, Melinis minutiflora, Passiflora suberosa,* and *Psidium cattleianum* (59 FR 32932; HINHP Database 2001).

Dubautia herbstobatae (Naenae)

Dubautia herbstobatae, a member of the aster family (Asteraceae) and a short-lived perennial, is a small, spreading shrub to 50 cm (20 in) tall. *Dubautia herbstobatae* is distinguished from other species on Oahu by the presence of the outer bracts of the flower heads fused, forming a cup surrounding the florets and the presence of one large vein showing in each leaf (Carr 1999).

Dubautia herbstobatae is likely outcrossing and possibly self-incompatible (i.e., pollen from the same plant will not produce seed). Flowering usually occurs in May and June. Pollination is almost certainly achieved by insect activity and fruit dispersal is probably quite localized and a risk of extinction from naturally occurring events and/or reduced reproductive vigor due to the small number of remaining individuals (Service 1998b).

Dubautia herbstobatae is known to be extant from four locations in the northern Waianae Mountains, on Ohikilolo and Kamaileunu Ridges, Keaau, and Waianae Kai on State lands and land under Federal jurisdiction; fewer than 100 individuals are known from these locations (HINHP Database 2001; GDSI 2001; EDA Database 2001).

Dubautia herbstobatae typically grows on rock outcrops, ridges, moderate slopes, or vertical cliffs in dry

or mesic shrubland at elevations between 266 and 978 m (872 and 3,208 ft). Associated species include *Dodonaea viscosa, Artemisia australis, Chamaesyce celastroides* (akoko), *Schiedea mannii* (NCN), *Carex meyenii, Bidens torta, Metrosideros polymorpha, Lysimachia waianaensis* (kolokolo kuahiwi), and *Eragrostis variabilis* (kawelu) (56 FR 55770; EDA, in litt. 2001; HINHP Database 2001)

The major threats to *Dubautia herbstobatae* are habitat degradation by feral goats and pigs; competition from the alien plant species *Ageratina riparia, Bromus mollis* (soft chest), *Melinis repens, Grevillea robusta, Schinus terebinthifolis, Leucana leucocephala,* and *Melinis minutiflora;* fire; visitation and possible trampling by humans; and the small number of individuals (56 FR 55770).

Eragrostis fosbergii (NCN)

Eragrostis fosbergii, a member of the grass family (Poaceae), is a perennial species with stout, tufted culms (stems) 61 to 102 cm (24 to 40 in) long, which usually arise from an abruptly bent woody base. This species is distinguished from others in the genus by its stiffly ascending flowering stalk and the long hairs on the margins of the glumes and occasionally on the margins of the lemmas (O'Connor 1999).

No information is available on reproductive cycles, longevity, specific environmental requirements, or limiting factors (Service 1998b).

Historically, *Eragrostis fosbergii* was known only from the Waianae Mountains of Oahu, from the slopes of Mount Kaala and in Waianae Kai and its associated ridges. Only six individuals are known to remain in Waianae Kai and on Kumaipo Trail in four populations on Federal and State lands (HINHP Database 2001; GDSI 2001).

Eragrostis fosbergii typically grows on ridge crests or moderate slopes in dry and mesic forests between 578 and 941 m (1,896 and 3,086 ft) elevation. Associated plant species include; *Chamaesyce* sp., *Alyxia oliviformis, Sphenomeris* sp. (palaa), *Nephrolepis exaltata, Doodia* sp. (ohu pukupulauii), *Bidens* sp., *Melicope* sp., *Acacia koa, Metrosideros polymorpha, Psydrax odorata, Dodonaea viscosa,* or *Eragrostis grandis* (HINHP Database 2001; 61 FR 53089).

The major threats to *Eragrostis fosbergii* are degradation of habitat by feral pigs and goats; competition with alien plant species such as *Schinus terebinthifolis, Grevillea robusta,* and *Psidium cattleianum;* trampling by hikers; hybridization with *Eragrostis grandis;* and a threat of extinction from random environmental events and/or reduced reproductive vigor due to the small number of remaining populations and individuals (HINHP Database 2001; Service 1998b; G. Koob, pers. comm. 2001).

Gardenia mannii (Nanu)

Gardenia mannii, a member of the coffee family (Rubiaceae), is a tree 5 to 15 m (16 to 50 ft) tall. This species is distinguished from others in the genus by the shape and number of the calyx spurs (Wagner *et al* 1999).

Gardenia mannii has been observed in flower and fruit in June and September. No further information is available on reproductive cycles, longevity, specific environmental requirements, or limiting factors. (Service 1998b)

Historically, *Gardenia mannii* was known from seven widely scattered populations in the Waianae Mountains and 39 populations distributed along almost the entire length of the Koolau Mountains of Oahu. Currently, there are 31 populations of *Gardenia mannii* at Haleauau Gulch, Peahinaia Ridge, Kaunala Gulch and Kaunala-Waimea Ridge, Castle Trail, Halawa Valley and Halawa-Kalauao Ridge, Moanalua Valley, Makaua-Kahana Ridge, Poamoho and Halemano Gulches, Kaluaa and Maunauna Gulches, Waimano Trail, Kawailoa Trail, Puu Hapapa and Waieli Gulch, Wiliwilinui Ridge, Koloa Stream, Waialae Nui-Kapakahi Ridge, Manaiki Valley, Laie Trail, Malaekahana-Waimea Summit Ridge, Haleauau Gulch, Schofield-Waikane Trail, Kaukonahua Gulch, Kapakahi Gulch, Manana Trail, Peahinaia Trail and Opaeula Stream, Kamana Nui Stream, Pukele, Hanaimoa Gulch, Papali Gulch, Kawai Nui, and Kaipapau Gulch. The 31 extant populations occur on private, State, and Federal lands. The existing populations total between 69 and 80 plants (HINHP Database 2001; GDSI 2001; EDA Database 2001).

Gardenia mannii is usually found on moderate to moderately steep gulch slopes, ridge crests, in gulch bottoms, and on streambanks in mesic or wet forests between 82 and 1,050 m (269 and 3,444 ft) in elevation. Associated plant species include *Coprosma foliosa, Pisonia* sp., *Bobea* sp., *Syzygium sandwicensis, Melicope* sp., *Cheirodendron* sp. (NCN), *Perotettia sandwicensis, Elaeocarpus* sp., *Cibotium* sp., *Thelypteris* sp., *Pipturus* sp., *Ilex anomala, Freycinetia arborea, Boehmeria grandis, Metrosideros polymorpha, Pouteria sandwicensis, Acacia koa, Dicranopteris linearis, Antidesma platyphyllum, Broussaisia arguta, Hedyotis acuminata, Alyxia oliviformis,* and *Psychotria mariniana* (HINHP Database 2001).

The major threats to *Gardenia mannii* are habitat degradation and/or destruction by feral pigs; potential impacts from military activities; competition with alien plant species such as *Toona ciliata, Passiflora suberosa, Psidium guajava, Leptospermum scoparium, Clidemia hirta, Rubus argutus,* and *Psidium cattleianum;* fire; and risk of extinction from random environmental events and/or reduced reproductive vigor due to the widely dispersed, small number of remaining individuals. The Kapakahi Gulch population is also threatened by the black twig borer (HINHP Database 2001; 61 FR 53089; Service 1998b).

Hedyotis degeneri (NCN)

Hedyotis degeneri, a member of the coffee family (Rubiaceae), is a prostrate shrub with four-sided stems and peeling, corky bark. This species can be distinguished from others in the genus on Oahu by its low-growing habit, the peeling corky layers on older stems, and the short, crowded, leafy shoots growing in the leaf axils; two varieties within the species are recognized *Hedyotis var coprosmifolia* and *Hedyotis var. degeneri* (Wagner *et al.* 1999).

This species has been observed in flower in November, June, and July, and in fruit in July. No further information is available on flowering cycle, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, or limiting factors (Service 1998b).

Historically, *Hedyotis degeneri* is known from Mt. Kaala in the northern Waianae Mountains. Variety *coprosmifolia* has not been collected since the 1980s and no current populations are known. Five populations, totaling 60 individuals, of variety *degeneri* are known from Makaleha, Pahole Gulch, Kahanahaiki, and Alaiheihe Gulch on Federal, State, city, and county lands (HINHP Database 2001; GDSI 2001; Wagner *et al.* 1999).

Hedyotis degeneri typically grows on ridge crests in diverse mesic forest between 349 and 1,083 m (1,145 and 3,552 ft) elevation. Associated species include *Styphelia tameiameiae* (pukiawe), *Dicranopteris linearis, Wikstroemia oahuensis* (akia), *Dodonaea viscosa, Alyxia oliviformis, Diospyros sandwicensis, Psychotria hathewayi, Cocculus* sp. (huehue), *Lysimachia hillebrandii* (kolokolo kuahiwi), *Chamaesyce multiformis, Lobelia yuccoides* (NCN), *Gahnia* sp. (NCN), *Pleomele* sp., *Carex meyenii, Psydrax odorata, Metrosideros*

polymorpha, or *Hedyotis terminalis* (HINHP Database 2001).

The major threats to *Hedyotis degeneri* are habitat destruction by feral pigs; competition from the alien plant species *Grevillea robusta, Clidemia hirta, Blechnum occidentale, Toona ciliata, Psidium guajava, Ageratina adenophora, Rubus argutus, Schinus terebinthifolius, Melinis minutiflora,* and *Psidium cattleianum;* and a threat of extinction from random environmental events and/or decreased reproductive vigor due to the small number of extant individuals and populations (HINHP Database 2001).

Hedyotis parvula (NCN)

Hedyotis parvula, a member of the coffee family (Rubiaceae), is a small, many-branched shrub, either upright or sprawling, with stems usually no more than 30 cm (1 ft) in length. Closely spaced, overlapping leaves which are uniform in size along the stem separate this species from other members of the genus on Oahu (Wagner *et al.* 1999).

Hedyotis parvula has been observed flowering in both winter and summer. The plant is found in dry areas and flowering may be induced by rain. No further information is available on reproductive cycles, specific environmental requirements, or limiting factors (Service 1998b).

Historically, *Hedyotis parvula* was known from the central and southern Waianae Mountains, from Makaleha Valley to Nanakuli Valley. Currently, this species is known from five locations on Federal, State, city, and county lands at Makaleha Ridge, Makua-Keaau Ridge, Lualualei-Nananakuli Ridge, Ohikilolo Ridge, and Halona. Five populations totaling between 116 and 131 individuals are known (HINHP Database 2001; EDA Database 2001; Wagner *et al.* 1999; GDSI 2001).

Hedyotis parvula typically grows on and at the base of cliff faces, rock outcrops, and ledges in mesic habitat at elevations between 331 and 1,160 m (1,086 and 3,805 ft). Associated species include *Eragrostis* sp. (kawelu), *Carex* sp., *Rumex* sp., *Metrosideros polymorpha, Chamaesyce* sp., *Bidens* sp., *Dodonaea viscosa, Psydrax odorata, Metrosideros tremuloides* (lehua ahihi), or *Plectranthus parviflorus* (alaala wai nui) (56 FR 55770; HINHP Database 2001; Wagner *et al.* 1999).

The major threats to *Hedyotis parvula* are habitat degradation by feral goats and pigs; competition from the alien plant species *Ageratina riparia, Myrica faya, Schinus terebinthifolius,* and *Melinis minutiflora;* and a threat of extinction from random environmental events and/or decreased reproductive vigor due to the small number of individuals and populations (56 FR 55770; HINHP Database 2001).

Labordia cyrtandrae (Kamakahala)

Labordia cyrtandrae, a member of the logania family (Loganiaceae), is a shrub 0.7 to 2 m (2.3 to 6.6 ft) tall. This species is distinguished from others in the genus by its fleshy, hairy, cylindrical stem which flattens upon drying, the shape and length of the floral bracts, and the length of the corolla tube and lobes (Wagner *et al.* 1999).

Labordia cyrtandrae has been observed flowering from May through June, and fruiting from July through August, is sporadically fertile year round. The flowers are functionally unisexual and male and female flowers are on separate plants. No further information is available on reproductive cycles, longevity, specific environmental requirements, or limiting factors (Service 1998b).

Historically, *Labordia cyrtandrae* was known from both the Waianae and Koolau Mountains of Oahu; in the Koolau Mountains, this species ranged from Kawailoa Trail to Waialae Iki, extending almost the entire length of the mountain range. This species currently is known only from 20 individuals in nine populations in Haleauau Gulch, Mohiakea Gulch, Kaala, and Makaleha. These populations occur on State, city, county, and private lands (GDSI 2001; EDA Database 2001; HINHP Database 2001).

Labordia cyrtandrae typically grows in shady gulches, slopes, and glens in mesic to wet forests and shrublands dominated by *Metrosideros polymorpha, Diplopterygium pinnatum*, and/or *Acacia koa* between the elevations between 212 and 1,233 m (695 and 4,044 ft). Associated plant species include *Broussaisia argutus, Cyrtandra* sp., *Phyllostegia* sp., *Dicranopteris linearis, Antidesma* sp., *Bidens torta, Artemisia australis, Dubautia plantaginea* (naenae), *Rumex* sp., *Lysimachia hillebrandii, Chamaesyce* sp., *Coprosma* sp., *Boehmeria grandis, Peperomia membranaceae* (ala ala wai nui), *Pouteria sandwicensis, Diplazium sandwichianum, Pipturus albidus, Perrottetia sandwicensis,* or *Psychotria* sp. (HINHP Database 2001; Service 1998b).

The greatest threats to *Labordia cyrtandrae* are habitat degradation and/or destruction by feral pigs; potential impacts from military activities; competition with the alien plant species *Axonopus fissifolius, Juncus planifolius* (NCN), *Setaria gracilis* (yellow foxtail), *Schinus terebinthifolius, Clidemia hirta, Rubus argutus,* and *Psidium cattleianum;* fire; and risk of extinction from random environmental events and/or reduced reproductive vigor due to the small number of remaining individuals and populations (HINHP Database 2001; Service 1998b).

Lepidium arbuscula (Anaunau)

Lepidium arbuscula, a member of the mustard family (Brassicaceae), is a gnarled shrub 0.6 to 1.2 m (2 to 4 ft) tall. The species is distinguished from others in the genus by its height (Wagner *et al.* 1999).

Lepidium arbuscula has been observed in flower in February. No further information is available on reproductive cycles, longevity, specific environmental requirements, or limiting factors (Service 1998b).

Historically, *Lepidium arbuscula* was known from 11 populations in the Waianae Mountains, Oahu. Currently, there are a total of approximately 1,000 individuals known from 10 locations on Federal, State, city, and county lands at Kamaileunu Ridge, Lualualei-Nanakuli Ridge, Kapuhi Gulch, northwest of Puu Kaua, Manini Gulch, Mohiakea Gulch, Ohikilolo Ridge, Makua-Keaau Ridge, the ridge between the Paahoa and Halona subdistricts, northwest of Puu Ku Makalii, and Halona subdistrict (GDSI 2001; HINHP Database 2001; EDA Database 2001).

Lepidium arbuscula on Oahu generally grows on exposed ridge tops and cliff faces in mesic and dry vegetation communities between 131 and 978 m (430 and 3,208 ft) elevation. This species is typically associated with native plant species such as *Metrosideros polymorpha, Peperomia* sp., *Dryopteris unidentata, Sida fallax, Schiedea ligustrina* (NCN), *Artemisia australis, Rumex albescens* (huahu ako), *Styphelia tameiameiae, Psydrax odorata, Carex wahuensis* (NCN), *Chamaesyce multiformis, Lysimachia hillebrandii, Dubautia* sp., *Sophora chrysophylla, Dodonaea viscosa, Eragrostis* sp., *Bidens* sp., or *Carex meyenii* (HINHP Database 2001; Service 1998b).

The primary threats to *Lepidium arbuscula* are habitat degradation and/or destruction by feral goats; potential impacts from military activities; competition with alien plants; and fire. The population at the head of Kapuhi Gulch is also threatened by its proximity to a road (HINHP Database 2001; 61 FR 53089).

Lipochaeta lobata var. *leptophylla* (Nehe)

Lipochaeta lobata var. *leptophylla*, a member of the aster family (Asteraceae),

is a low, somewhat woody, perennial herb with arched or nearly prostrate stems that may be up to 150 cm (59 in) long. Aside from a very rare coastal species, this species is the only member of its genus on Oahu with four-parted disk florets. This variety has narrower leaves, spaced more closely along the stem, than those of *Lipochaeta lobata* var. *lobata*, the only other variety of the species (Wagner *et al.* 1999).

Flowering of *Lipochaeta lobata* var. *leptophylla* is probably rain-induced. Populations may consist of fewer distinct individuals than it appears because many ''individuals'' are connected underground by the roots and are probably clones. No further information is available on reproductive cycles, specific environmental requirements, or limiting factors (Service 1998b).

Historically, *Lipochaeta lobata* var. *leptophylla* was known from the southern Waianae Mountains, from Kolekole Pass to Lualualei. Currently, there are a total of 147 individuals found in five locations on State, Federal, city, and county lands Lualualei-Nanakuli Ridge, Kauhiuhi, Puu Hapapa, Mikilua, and Kamaileunu Ridge, (HINHP Database 2001; GDSI 2001; EDA Database 2001; Wagner *et al.* 1999).

Lipochaeta lobata var. *leptophylla* typically grows on cliffs, ridges, and slopes in dry or mesic shrubland at elevations between 256 and 978 m (840 and 3,208 ft). Associated species include *Diospyros* sp., *Eragrostis* sp., *Artemisia australis, Lipochaeta tenuis* (nehe), *Stenogyne* sp. (NCN), *Carex meyenii, Dodonaea viscosa, Peperomia* sp., *Psydrax odorata,* and *Bidens* sp. (HINHP Database 2001; EDA, *in litt.* 2001).

The major threats to *Lipochaeta lobata* var. *leptophylla* include competition from alien plant species such as *Ageratina riparia, Passiflora suberosa, Lantana camara, Grevillea robusta, Kalanchoe pinnata, Erigeron karvinskianus, Ageratina adenophora, Schinus terebinthifolius, Leucaena leucocephala,* and *Melinis minutiflora;* habitat degradation by feral pigs and goats; fire; and a threat of extinction from random environmental events and/or decreased reproductive vigor due to the small number of individuals and populations (HINHP Database 2001).

Lipochaeta tenuifolia (Nehe)

Lipochaeta tenuifolia, a member of the aster family (Asteraceae), is a low growing, somewhat woody perennial herb with short, more or less erect branches. Its five-parted disk florets and its deeply cut, stalkless leaves separate this species from other members of the genus (Wagner *et al.* 1999).

Lipochaeta tenuifolia has been observed flowering in April. No other information is available on reproductive cycles, longevity, specific environmental requirements, or limiting factors (Service 1998b).

Lipochaeta tenuifolia occurs in the northern half of the Waianae Mountains, from Kaluakauila Gulch to Kamaileunu Ridge and east to Mt. Kaala, and northwest, southwest, southeast, and north of Puu Ku Makalii on State, Federal, city, and county lands. The 12 known populations contain between 759 to 1,174 individuals (HINHP Database 2001; EDA Database 2001; GDSI 2001).

Lipochaeta tenuifolia typically grows on ridgetops and bluffs in open areas and protected pockets of dry to mesic forests and shrublands and forests dominated by *Diospyros sandwicensis* at elevations between 67 and 978 m (220 and 3,208 ft). Associated species include *Diospyros* sp., *Dodonaea viscosa, Eragrostis* sp., *Artemisia australis, Schiedea* sp., *Carex meyenii, Rumex* sp., *Dubautia* sp., *Bryophyllum* sp. (NCN), *Osteomeles anthyllidifolia* (ulei), *Reynoldsia sandwicensis, Psydrax odorata, Doryopteris* sp. (kumu niu), *Santalum* sp., *Myoporum sandwicense, Sapindus oahuensis,* or *Bidens* sp. (HINHP Database 2001; Wagner *et al.* 1999).

The major threats to *Lipochaeta tenuifolia* are habitat degradation by feral goats and pigs; competition for light and space from alien plant species including *Ageratina riparia, Blechnum occidentale, Grevillea robusta, Panicum maximum, Lantana camara, Hyptis pectinata, Rivina humilis, Aleurites moluccana, Toona ciliata, Coffea arabica* (coffee), *Schinus terebinithifolius, Leucaena leucocephala, Melinis minutiflora,* and *Psidium cattleianum;* and fire (HINHP Database 2001; 56 FR 55770).

Lobelia gaudichaudii ssp. *koolauensis* (NCN)

Lobelia gaudichaudii ssp. *koolauensis,* a member of the bellflower family (Campanulaceae), is an unbranched, woody shrub 0.3 to 1 m (1 to 3.5 ft) tall. The species is distinguished from others in the genus by the length of the stem, the length and color of the corolla, the leaf width, the length of the floral bracts, and the length of the calyx lobes. The subspecies *koolauensis* is distinguished by the greenish or yellowish white petals and the branched flowering stalks (61 FR 53089; Lammers 1990).

Lobelia gaudichaudii ssp. *koolauensis* has been observed in flower in September and fruit in December. No other information is available on reproductive cycles, longevity, specific environmental requirements, or limiting factors (Service 1998b).

Historically, *Lobelia gaudichaudii* ssp. *koolauensis* was known from only two populations in the central Koolau Mountains on Oahu. Currently, this subspecies is known from four populations in the central Koolau Mountains; on Federal, State, and private lands Waimano-Waiawa Ridge, Waimano, plateau above Sacred Falls, and Kaukonahua Gulch. The total number of plants is estimated to be fewer than 270 (HINHP Database 2001; EDA Database 2001; GDSI 2001).

Lobelia gaudichaudii ssp. *koolauensis* typically grows on moderate to steep slopes in *Metrosideros polymorpha* lowland wet shrublands and bogs at elevations between 383 and 867 m (1,256 and 2,844 ft). Associated plant species include—*Sadleria pallida, Isachne distichophylla* (ohe), *Vaccinium dentatum* (ohelo), *Cibotium* sp., *Melicope* sp., *Bidens* sp., *Scaevola* sp., *Machaerina angustifolia, Dicanthelium koolauensis* (NCN), or *Broussaisia arguta* (HINHP Database 2001; EDA, *in litt.* 2001).

The primary threats to *Lobelia gaudichaudii* ssp. *koolauensis* are—habitat degradation and/or destruction by feral pigs; competition with the alien plant species *Axonopus fissifolius, Pterolepis glomerata, Sacciolepis indica,* and *Clidemia hirta;* trampling by hikers; landslides; and risk of extinction from random environmental events and/or reduced reproductive vigor of the one remaining population (HINHP Database 2001; 61 FR 53089).

Lobelia monostachya (NCN)

Lobelia monostachya, a member of the bellflower family (Campanulaceae), is a prostrate woody shrub with stems 15 to 25 cm (6 to 10 in) long. The species is distinguished from others in the genus by its narrow, linear leaves without stalks and its short pink flowers (Lammers 1999).

This species has been observed in flower in May and June. Further information is not available on reproductive cycles, longevity, specific environmental requirements, or limiting factors (Service 1998b).

Historically, *Lobelia monostachya* was known only from the Koolau Mountains and had not been seen since its original discovery in the 1800s in Niu Valley, and in the 1920s in Manoa Valley. In 1994, Joel Lau discovered one individual in a previously unknown

location in Wailupe Valley on State and private lands. Currently, a total of three plants are known (HINHP Database 2001; GDSI 2001).

Lobelia monostachya occurs on steep, sparsely vegetated cliffs in mesic shrubland between 44 and 614 m (144 and 2,014) elevation. Associated plant species include—*Artemisia australis, Carex meyenii, Psilotum nudum,* or *Eragrostis* sp. (HINHP Database 2001).

The major threats to *Lobelia monostachya* are—predation by rats; competition with the alien plants *Schinus terebinthifolius, Ageratum riparia, Kalanchoe pinnata,* and *Melinis minutiflora*; and risk of extinction from random environmental events and/or reduced reproductive vigor due to the low number of individuals in the only known population (HINHP Database 2001; 61 FR 53089).

Lobelia oahuensis (NCN)

Lobelia oahuensis, a member of the bellflower family (Campanulaceae), is a stout, erect, unbranched shrub 1 to 3 m (3 to 10 ft) tall. *Lobelia oahuensis* differs from other members of the genus in having the following combination of characters erect stems 1 to 3 m (3 to 10 ft) long, dense rosettes of leaves at the end of stems, lower leaf surfaces covered with coarse grayish or greenish hairs, and flowers 42 to 45 mm (1.7 to 1.8 in) long (Lammers 1999).

This species was observed in flower during November. No further information is available on reproductive cycles, longevity, specific environmental requirements, or limiting factors (Service 1998b).

Historically, *Lobelia oahuensis* was known from Kahana Ridge, Kipapa Gulch, and the southeastern Koolau Mountains of Oahu. Ten populations totaling 42 individuals are located on private, State, and Federal lands. These populations occur on Mt. Olympus, Konahuanui summit, Waikakalaua-Waikane Ridge, Puu o Kona, the summit area between Aiea and Halawa Valley, Puu Keahiakahoe and the summit ridge south of Puu Keahiakahoe, Waialae Nui-Waimanalo and Kapakahi-Waimanalo, Puu Kalena, and Eleao (HINHP Database 2001; EDA Database 2001; GDSI 2001).

Lobelia oahuensis grows on steep slopes between elevations of 415 and 959 m (1,361 and 3,146 ft) on summit cliffs in cloudswept wet forests or in lowland wet shrubland that are frequently exposed to heavy wind and rain. Associated plant species include—*Sadleria squarrosa* (amau), *Peperomia* sp., *Broussaisia arguta, Scaevola* sp., *Vaccinium* sp., *Hedyotis* sp., *Cibotium* sp., *Freycinetia arborea, Lycopodium* sp. (wawae iole), *Bidens* sp., *Wikstroemia* sp., *Phyllostegia* sp., *Syzygium sandwicensis, Melicope* sp., *Metrosideros polymorpha, Dicranopteris linearis, Machaerina angustifolia, Cheirodendron trigynum* (olapa), *Dubautia laxa,* or *Labordia hosakae* (kamakahala) (HINHP Database 2001; Service 1998b; Lammers 1999).

The primary threats to *Lobelia oahuensis* are—competition with the alien plant species *Rubus rosifolius, Rubus argutus, Paspalum conjugatum, Erigeron karvinskianus,* and *Clidemia hirta* and habitat degradation by feral pigs (HINHP Database 2001).

Melicope lydgatei (Alani)

Melicope lydgatei, a member of the citrus family (Rutaceae), is a small shrub that has leaves arranged oppositely or in threes. The species' leaf arrangement (opposite or in groups of three), the amount of fusion of the fruit sections, and the hairless exocarp (outermost layer of the fruit wall) and endocarp (innermost layer) distinguish it from others in the genus (Wagner *et al.* 1999).

This species has been observed in flower in May and in fruit from June to July. No other information is available on reproductive cycles, longevity, specific environmental requirements, or limiting factors (Service 1998b).

Melicope lydgatei was formerly known throughout the Koolau Mountains of Oahu from Hauula to Kahana, Kipapa Gulch to Waimano, and Kalihi Valley to Wailupe Valley. Only four populations, totaling between 14 to 15 individuals, remain within its historical range on State and private lands along Poamoho Trail, along Peahinaia Trail, and along Manana Trail (HINHP Database 2001; GDSI 2001; EDA Database 2001).

Melicope lydgatei typically grows in association with—*Acacia koa, Metrosideros polymorpha, Dicranopteris linearis, Psychotria* sp., *Syzygium sandwicensis,* or *Bobea elatior* on ridges in mesic and wet forests at elevations between 349 and 671 m (1,145 and 2,201 ft) (HINHP Database 2001; Service 1998b; EDA, *in litt.* 2001).

The primary threat to *Melicope lydgatei* is a threat of extinction due to random environmental events and/or reduced reproductive vigor because of the small number of individuals and populations remaining (59 FR 14482).

Melicope saint-johnii (Alani)

Melicope saint-johnii, a member of the rue family (Rutaceae), is a slender tree 3 to 6 m (10 to 20 ft) tall. The leaves are opposite or occasionally occur in threes on young lateral branches. The leaves are narrowly to broadly elliptic, sometimes elliptic egg-shaped or rarely lance-shaped. Three to 11 flowers are arranged on an flowering stalk and are usually functionally unisexual, with staminate (male) and pistillate (female) flowers. The staminate flowers have broadly egg-shaped sepals which are hairless to sparsely covered with hair. The triangular petals are densely covered with hair on the exterior. The pistillate flowers are similar in hairiness to staminate flowers, but are slightly smaller in size. The dry fruit splits at maturity. The exocarp is hairless, whereas the endocarp is hairy. This species is distinguished from others in the genus by the combination of the hairless exocarp, the hairy endocarp, the densely hairy petals, and the sparsely hairy to smooth sepals (Stone *et al.* 1999).

No information exists on reproductive cycles, longevity, specific environmental requirements, or limiting factors.

Historically, *Melicope saint-johnii* was known from both the Waianae and Koolau Mountains at Makaha to Mauna Kapu in the Waianae Mountains and Papali Gulch in Hauula, Manoa-Aihualama, Wailupe, and Niu Valley in the Koolau Mountains. Today five locations of this species are found on Federal and private lands from the region between Puu Kaua and Puu Kanehoa to Mauna Kapu in the southern Waianae Mountains. Fewer than 170 individuals of this species are known (GDSI 2001; HINHP Database 2001).

Melicope saint-johnii typically grows on mesic forested ridges and gulch bottoms between elevations of 240 and 953 m (787 and 3,126 ft). Associated native plant species include—*Artemisia australis, Eragrostis* sp., *Hedyotis schlechtendahliana, Lysimachia hillebrandii, Bidens torta, Alyxia oliviformis, Carex wahuensis, Panicum beechyi* (NCN), *Rumex albescens, Pittosporum* sp., *Pleomele halapepe* (hala pepe), *Pipturus albidus, Metrosideros polymorpha, Coprosma longifolia, Labordia kaalae* (kamakahala), or *Psychotria hathewayi* (HINHP Database 2001).

The primary threats to *Melicope saint-johnii* are habitat degradation and/or destruction by feral goats and pigs; potential predation by the black twig borer; potential fire; and competition with alien plant species such as *Psidium cattleianum, Clidemia hirta, Passiflora suberosa, Melinis minutiflora, Schinus terebinthifolius, Myrica faya, Ageratum riparia, Passiflora subcordata* (huehue haole), *Lantana camara, Ageratina adenophora,* and *Grevillea robusta;* and risk of extinction due to naturally-occurring events and/or reduced reproductive vigor because of the few

individuals remaining and their restricted distribution (Service 1998b; 61 FR 53089; HINHP Database 2001).

Myrsine juddii (Kolea)

Myrsine juddii, a member of the myrsine family (Myrsinaceae), is a many branched shrub ranging from 1 to 2 m (3.5 to 6.6 ft) tall. The leathery leaves are narrowly inverse lance-shaped or more elliptic. The upper leaf surface is hairless, whereas the lower surface is sparsely to moderately covered with short, coarse, stiff, whitish or brownish hairs toward the base and along the midrib. The leaf base is broadly wedge-shaped to heart-shaped, and the margins are smooth and curl under. The flowers are unisexual and the plants are dioecious (male and female flowers are on separate plants). Flowers occur in groups of four to eight in tight clusters surrounded by small bracts. The yellowish green petals are narrowly inverse lance-shaped. The fleshy, round fruit contains a single seed. This species is distinguished from others in the genus by the hairiness of the lower leaf surface and the shape of the leaf base. In addition, the hairy leaves distinguish this species from all other species of *Myrsine* on Oahu (Wagner *et al.* 1999).

Myrsine juddii has been reported from only three populations in the central Koolau Mountains—the North Kaukonahua-Kahana Summit divide, Peahinaia Trail, and Puu Kainapuaa to Poamoho Trail. These populations are found on State and Federal lands. The total number is thought to be around 5,000 individuals (HINHP Database 2001; GDSI 2001).

Myrsine juddii typically grows on ridge crests and gulch slopes in wet forests and shrublands dominated by *Metrosideros polymorpha* or a mixture of *Metrosideros polymorpha* and *Dicranopteris linearis* at elevations between 384 and 867 m (1,260 and 2,844 ft). Associated plant species include— *Machaerina* sp., *Cheirodendron trigynum, Cheirodendron platyphyllum, Melicope clusiifolia* (kolokolo mokihana), *Psychotria mariniana,* and *Syzygium sandwicensis* (Service 1998b; 61 FR 53089; GDSI 2001; HINHP Database 2001; EDA, *in litt.* 2001).

The primary threats to *Myrsine juddii* are habitat degradation and/or destruction by feral pigs; potential impacts from military activities; competition with alien plant species such as *Clidemia hirta* and *Psidium cattleianum;* and a risk of extinction from naturally occurring events and/or reduced reproductive vigor due to the small number of extant populations (Service 1998b; 61 FR 53089; HINHP Database 2001).

Neraudia angulata (NCN)

Neraudia angulata, a member of the nettle family (Urticaceae), is an erect shrub 3 m (10 ft) tall. Leaves are thin and elliptic to oval in outline. The upper leaf surface has a few silky hairs, and the lower surface is moderately hairy. Flowers are male or female and grow on different plants. The female flowers produce a dry-walled fruit which is surrounded by fleshy, fused sepals. This species is distinguished from other species in its genus by the conspicuously angled, ridged, fleshy calyx in the female flower. There are two varieties, *N. a. var. angulata* and *N. a. var. dentata,* that differ in the types of leaf hairs on the lower surface of the leaves and the type of leaf margin (Wagner *et al.* 1999).

Neraudia angulata flowers and fruits from early spring to summer. Fruits mature in about a month. No other information exists on reproductive cycles, longevity, specific environmental requirements, or limiting factors (Service 1998b).

Historically, *Neraudia angulata* was known from almost the entire length of the Waianae Mountains, from Kaluakauila Gulch nearly to Puu Manawahua. This species is currently known from Kaluakauila Gulch along Makua-Keaau Ridge to Makaha-Waianae Kai Ridge, on Federal, State, city, county, and private lands. The five known populations are estimated to comprise approximately 51 individuals (GDSI 2001; HINHP Database 2001; EDA Database 2001).

Neraudia angulata var. *angulata* typically grows on slopes, ledges, or gulches in lowland mesic or dry forest between 189 and 978 m (620 and 3,208 ft) elevation. Associated plant species include— *Diospyros* sp., *Dodonaea viscosa, Bidens* sp., *Artemisia australis, Sida fallax, Carex meyenii, Psydrax odorata, Hibiscus* sp., *Pisonia sandwicensis* (ūlu), or *Nestegis sandwicensis. Neraudia angulata* var. *dentata* typically grows on cliffs, rock embankments, gulches, and slopes in mesic or dry forests between 110 and 978 m (361 and 3,208 ft). Associated native plant species include *Diospyros sandwicensis, Diospyros hillebrandii, Dodonaea viscosa, Artemisia australis, Alyxia oliviformis, Sapindus oahuensis, Psydrax odorata, Pisonia* sp., *Antidesma pulvinatum, Nestegis sandwicensis, Myrsine lanaiensis, Hibiscus* sp., *Metrosideros polymorpha, Bidens torta, Canavalia* sp., *Rauvolfia sandwicensis, Carex* sp., *Charpentiera* sp., *Sida fallax, Streblus pendulinus,* or *Eragrostis* sp. (HINHP Database 2001; EDA, *in litt.* 2001; Service 1998b; 56 FR 55770).

The major threats to *Neraudia angulata* var. *angulata* are habitat degradation by feral goats and pigs; military activities; competition from the alien plant species *Ageratina riparia, Schinus terebinthifolius, Passiflora subcordata, Melinis minutiflora,* and *Psidium cattleianum;* fire; and the small number of extant individuals. The major threats to *Neraudia angulata* var. *dentata* are habitat degradation by feral pigs and goats; fire; and competition with the alien plant species *Melinis minutiflora, Tecoma castanifolia* (yellow elder), *Schinus terebinthifolius, Melinis* sp., *Ageratina riparia, Montanoa hibiscifolia, Passiflora suberosa, Ageratina adenophora, Psidium guajava, Pimenta dioica, Aleurites moluccana, Syzygium cumini, Schefflera actinophylla, Oplismenus hirtellus, Leucaena leucocephala, Blechnum occidentale,* and *Erigeron karvinskianus* (HINHP Database 2001; Service 1998b; 56 FR 55770).

Phyllostegia hirsuta (NCN)

Phyllostegia hirsuta, a member of the mint family (Lamiaceae), is an erect subshrub or vine with stems densely covered with coarse or stiff hairs. The wrinkled leaves are egg-shaped, and both leaf surfaces are moderately covered with long, flat hairs. The upper surface is inconspicuously dotted with glands, while the lower surface is more densely glandulose. The egg-shaped floral bracts are 3 to 6 mm (0.1 to 0.2 in) long. The flowers have two lips the upper one is approximately 3 mm (0.1 in) long and the lower one is 5 to 7 mm (0.2 to 0.3 in) long. The tubular portion of the flower is slightly curved. The corolla is white and usually purple-tinged on the upper lip. The fruit is a nutlet about 3 mm (0.1 in) long. This species is distinguished from others in the genus by the texture, hairiness, and size of the leaves and the length of the upper bracts (Wagner *et al.* 1999).

Phyllostegia hirsuta has been observed in flower in February and in fruit in June. Cultivated material flowered in July. No other information on reproductive cycles, longevity, specific environmental requirements, or limiting factors is available (Service 1998b).

Historically, *Phyllostegia hirsuta* was known from widespread populations in the Waianae and Koolau Mountains on Oahu. Currently, this species is found in 23 locations with a total of between 214 and 227 individuals from the ridge between Makaha and Waianae Kai to the south fork of North Palawai Gulch in the Waiaanae Mountains and from

Kawainui Gulch in Kawailoa Training Area to south Kaukonahua drainage in the Koolau Mountains. These populations occur on Federal, State, city, county, and private lands (GDSI 2001; HINHP Database 2001; EDA Database 2001).

Phyllostegia hirsuta is usually found on steep, shaded slopes, cliffs, ridges, gullies, and streambanks in mesic or wet forests dominated by *Metrosideros polymorpha* or a mixture of *Metrosideros polymorpha* and *Dicranopteris linearis* between 195 and 1,202 m (640 and 3,943 ft) elevation. Associated plant species include *Pisonia* sp., *Diplazium sandwichiana, Freycinetia arborea, Chamaesyce multiformis, Hibiscus* sp., *Rumex albescens, Machaerina angustifolia, Clermontia kekeana* (oha wai), *Perotettia sandwicenum, Cibotium* sp., *Hedyotis schlechtendahliana, Ilex anomala, Lysimachia hillebrandii, Melicope* sp., *Psychotria* sp., *Astelia* sp. (painiu), *Antidesma platyphyllum, Dubautia laxa, Cyanea membranacea, Elaeocarpus bifidus, Myrsine sandwicensis* (kōlea), *Scaevola gaudichaudiana* (naupaka kuahiwi), *Pleomele* sp., *Dryopteris unidentata, Streblus pendulinus, Claoxylon sandwicense, Nothocestrum* sp., *Neraudia* sp. (NCN), *Zanthoxylum kauaense* (ae), *Labordia kaalae, Cyrtandra waianaeensis, Phyllostegia grandiflora* (NCN), *Liparis hawaiiensis* (awapuhiakanaloa), *Dubautia sherffiana* (naenae), *Pouteria sandwicensis, Brousaissia arguta, Pipturis* sp., *Coprosma longifolia, Hedyotis terminalis, Myrsine lessertiana,* or native ferns (Service 1998b; HINHP Database 2001; 61 FR 53089).

The primary threats to *Phyllostegia hirsuta* are habitat degradation and/or destruction by feral pigs; potential impacts from military activities; rockslides; rats; and competition with *Passiflora suberosa, Blechnum occidentale, Pimenta dioica, Paspalum conjugatum, Rubus rosifolius, Drymaria cordata, Axonopus fissifolius, Athyrium* sp. (NCN), *Adiantum raddianum, Melinis minutiflora, Physalis peruviana* (poha), *Buddleia asiatica, Schinus terebinthifolius, Clidemia hirta, Lantana camara, Rubus argutus,* or *Psidium cattleianum* (HINHP Database 2001).

Phyllostegia kaalaensis (NCN)

Phyllostegia kaalaensis, a member of the mint family (Lamiaceae), is an herb. The egg-shaped leaves are 5 to 13 cm (2 to 5 in) long. Usually six flowers are arranged along a flowering stalk. The calyx is glabrous and the corolla tube is hairless. The species is distinguished from others of the genus by the spreading, pointed teeth on the leaf edges and by the hairs along the margins of the calyx and bracts (*Wagner et al.* 1999).

No information is available on reproductive cycles, longevity, specific environmental requirements, or limiting factors (Service 1998b).

Phyllostegia kaalaensis has been known from only six scattered populations in the Waianae Mountains of Oahu. Currently, this species is known from four populations containing a total of fewer than 45 plants, in Waianae Kai, Pahole Gulch, central Ekahanui Gulch, Ekahanui Gulch, and Palikea Gulch. These populations occur on State and private lands (HINHP Database 2001; GDSI 2001).

Phyllostegia kaalaensis is found on gulch slopes and bottoms and on almost vertical rock faces in mesic forest or *Sapindus oahuensis* forest between 374 and 796 m (1,227 and 2,611 ft) elevation. Associated plant include *Myrsine lanaiensis, Myrsine lessertiana, Psychotria hathewayi, Antidesma platyphyllum, Diplazium sandwichianum, Pipturus albidus, Hibiscus* sp., *Claoxylon sandwicense, Neraudia melastomifolia, Streblus pendulinus, Pouteria sandwicensis, Freycinetia arborea,* or *Urera glabra,* (HINHP Database 2001).

The major threats to *Phyllostegia kaalaensis* are habitat degradation and/or destruction by feral pigs and goats; fire; trail clearing; competition with the alien plant species *Rubus rosifolius, Thelypteris parasitica, Ageratina adenophora, Buddleia asiatica, Psidium guajava, Lantana camara, Blechnum occidentale, Passiflora suberosa, Aleurites moluccana, Cordyline fruticosa, Oplismenus hirtellus, Passiflora edulis* (passion fruit), *Passiflora ligularis, Toona ciliata, Schinus terebinthifolius, Passiflora subcordata, Clidemia hirta,* and *Psidium cattleianum;* and risk of extinction from naturally-occurring events and/or reduced reproductive vigor due to the small number of populations and individuals (Service 1998b; 61 FR 53089; HINHP Database 2001).

Pritchardia kaalae (loulu)

Pritchardia kaalae, a member of the palm family (Arecaceae), is a single-stemmed palm up to 5 m (16 ft) tall. The waxy, hairless leaves are thin and papery or thick and leathery. Sometimes small points, dots, or linear, rusty scales are scattered on the lower leaf surface. The flowering stalks are composed of one or more branches. The round fruits are approximately 2 cm (0.8 in) in diameter. *Pritchardia kaalae* is distinguished from other members of the genus by the hairless or scaly leaves (Read and Hodel 1999).

Pritchardia kaalae plants have been observed in fruit in April, August and October and may fruit throughout the year. No other information exists on reproductive cycles, longevity, specific environmental requirements, or limiting factors (Service 1998b).

Historically, *Pritchardia kaalae* was known from scattered populations in the central and north-central Waianae Mountains of Oahu. Currently, six populations are known from Manuwai Gulch, East Makaleha, Kaumokunui Gulch, Waianae Kai-Haleauau summit divide, Makua-Keaau Ridge and Makaha Valley, totaling about 200 individuals. These populations are located on Federal, State, city, and county lands (HINHP Database 2001; GDSI 2001; EDA Database 2001).

Pritchardia kaalae is typically found on steep slopes and gulches in mesic forest or shrubland between elevations of 421 and 1,123 m (1,381 and 3,683 ft). Associated plant species include *Dodonaea viscosa, Myrsine* sp., *Bidens* sp., *Pipturus* sp., *Dubautia* sp., *Metrosideros polymorpha, Eragrostis* sp., *Metrosideros tremuloides,* or *Tetraplasandra* sp. (ohe ohe) (Service 1998b; HINHP Database 2001; 61 FR 53089; EDA, *in litt.* 2001).

Major threats to *Pritchardia kaalae* are habitat degradation by feral pigs and goats; fruit predation by rats; potential impacts from military activities; competition with the alien plant species *Schinus terebinthifolius, Ageratina adenophora,* and *Rubus argutus;* potential fire; and risk of extinction from naturally-occurring events and/or reduced reproductive vigor due to the small number of populations (Service 1998b; HINHP Database 2001; 61 FR 53089).

Sanicula mariversa (NCN)

Sanicula mariversa, a member of the parsley family (Apiaceae), is an upright herb, 40 to 70 cm (16 to 28 in) tall which produces a caudex (a single branched stem from a sturdy base) growing just beneath the surface of the soil. There are many heart- to kidney-shaped, leathery, three- to five-lobed leaves growing from the base of the plant. Leaves on the stem become smaller and more deeply lobed the closer they are to the tip of the stem. Flowers are arranged in one to four more or less flat-topped clusters; each cluster comprises 10 to 20 flowers and is located at the end of the stem or in the leaf axils. Each flower cluster has eight to 12 bracts beneath it and comprises both male and

hermaphroditic flowers. There are five nearly circular, fused, toothed, yellow petals. The egg-shaped fruit is covered with hooked prickles and separates into two single-seeded parts. The larger size of the plant and basal leaves, the color of the flower petals, and the hooked prickles on the fruit separate this species from others of the genus in Hawaii (Constance and Affolter 1999).

Sanicula mariversa is known to flower from February through May, and fruits can be found until August. Dry fruits remain on infructescences for a long time and may persist beyond August. No further information is available on reproductive cycles, specific environmental requirements, or limiting factors (Service 1998b).

Historically, *Sanicula mariversa* was known from the central Waianae Mountains from Makua-Keaau Ridge to Kaluaa-Lualualei Summit Ridge. This species is now extant on Ohikilolo Ridge, Keaau-Makaha Ridge, Kamaileunu Ridge, and northwest of Puu Kanehoa on Federal, State, city, and county lands. The four known populations contain approximately 170 individuals (HINHP Database 2001; GDSI 2001; EDA Database 2001).

Sanicula mariversa typically grows on well-drained, dry slopes and rock faces in mesic shrublands and open grassy areas at elevations between 582 and 978 m (1,909 and 3,208 ft). Associated species include *Carex meyenii*, *Eragrostis* sp., *Bidens torta*, *Metrosideros tremuloides*, *Doryopteris* sp., or *Metrosideros polymorpha* (HINHP Database 2001; EDA, *in litt.* 2001).

The major threats to *Sanicula mariversa* are habitat degradation by feral goats; fire; erosion; competition from the alien plant species *Stachytarpheta dichotoma*, *Ageratina riparia*, *Erigeron karvinskianus*, *Schinus terebinthifolius*, and *Melinus minutiflora*; trampling by humans on or near trails; and the risk of extinction due to the small number of populations (Service 1998b; HINHP Database 2001; 56 FR 55770).

Schiedea kaalae (NCN).

Schiedea kaalae, a member of the pink family (Caryophyllaceae), has a short woody caudex less than 20 cm (8 in) long. The thick, single-veined leaves are bunched at the top of the stem; they are long and elliptic or broader toward the tip and can reach a length of 24 cm (9.4 in) and a width of 6 cm (2.4 in). Flowers are in a panicle (an open, much branched inflorescence). The flowers lack petals, but have purple bracts and sepals. Stamens and nectaries each number five and are about 4 to 5 mm (0.2 in) long. Capsules are about 4 mm (0.2 in) long, and seeds are dark grayish brown and about 1 mm (0.04 in) long. This species can be distinguished from other members of its genus by its very short stems and its thick leaves with one conspicuous vein (Wagner *et al.* 1999).

This plant has been observed in flower from March through June. Based on field and greenhouse observations, *Schiedea kaalae* has perfect flowers (each individual has both male and female reproductive organs). A series of experimental self-pollinations, within-population crosses, and crosses among populations have demonstrated that *Schiedea kaalae* experiences moderately strong inbreeding depression. These results indicate that reductions in population size could result in expression of inbreeding depression in seedlings, with potentially deleterious consequences for the long-term persistence of this species. Consistent with the evidence for inbreeding depression, *Schiedea kaalae* appears to be an outcrossing species. Under greenhouse conditions, flowers do not set fruit unless pollinated. In the field, this species was observed being visited by the introduced syrphid fly, *Simosyrphus grandicornis*. The fly did not appear to be foraging for nectar but may have been feeding on pollen. Individuals of *Schiedea kaalae* appear to be long-lived, but there is no evidence of regeneration from seed under field conditions. Seedlings of *Schiedea kaale,* like those of other *Schiedea* species in mesic or wet sites are apparently consumed by introduced slugs and snails, which have been observed feeding on *Schiedea membranacea*, a mesic forest species from Kauai. *Schiedea* occurring in dry areas produce abundant seedlings following winter rains, presumably because dry areas have fewer alien predators (Service 1998b; Weller and Sakai, unpublished data).

Historically, *Schiedea kaalae* was known from the north-central and south-central Waianae Mountains and the northern Koolau Mountains of Oahu. This species remains on State and private lands at Pahole Gulch, Kaluaa Gulch, Puu Kaua, Palawai Gulch, Maakua Gulch, Huliwai Gulch, and Makaua Stream. The eight known populations contain only 49 individuals (HINHP Database 2001; GDSI 2001).

Schiedea kaalae typically grows on steep slopes, cliffs, streambanks, and deep shade in diverse mesic and wet forests at elevations between 64 and 869 m (210 and 2,850 ft). Associated species include *Pisonia sandwicensis*, *Psychotria hathewayi*, *Pouteria sandwicensis*, *Freycinetia arborea*, *Pipturus albidus*, *Cyrtandra laxiflora*, *Hedyotis acuminata*, *Selaginella arbuscula*, *Cyrtandra calpidicarpa*, *Boehmeria grandis*, *Claoxylon sandwicense*, *Diospyros hillebrandii*, *Dryopteris unidentata*, *Alyxia oliviformis*, *Charpentiera* sp., *Athyrium sandwichianum*, *Xylosma hawaiiensis* (maua), *Nothocestrum longifolium* (aiea), *Athyrium arnottii* (hoio), or *Pisonia umbellifera* (HINHP Database 2001; Service 1998b).

The major threats to *Schiedea kaalae* are habitat degradation by feral pigs and goats; competition from the alien plant species *Passiflora suberosa*, *Psidium cattleianum*, *Blechnum occidentale*, *Ageratina riparia*, *Psidium guajava*, *Thlypteris parasitica*, *Oplismenus hirtellus*, *Cordyline fruticosa*, *Rubus rosifolius*, *Schinus terebinthifolius*, *Ageratina adenophora*, *Passiflora subcordata*, *Clidemia hirta*, *Melinus minutiflora*, and *Myrica faya*; fire; predation by introduced slugs and snails; and the small number of extant individuals and a risk of extinction from naturally occurring events and/or reduced reproductive vigor due to the small number of remaining individuals (HINHP Database 2001; Service 1998b).

Schiedea kealiae (NCN)

Schiedea kealiae, a member of the pink family (Caryophyllaceae), is a subshrub with weakly ascending to sprawling stems which form loose clumps. The lower stems are smooth while the upper stems and flowering stalk bear glands. The opposite leaves are lance-shaped to elliptic lance-shaped and conspicuously three-veined with a prominent midrib. The flowering stalk have numerous unisexual flowers in crowded clusters. The green sepals of the male flowers are approximately 2.5 mm (0.1 in) long. The sepals of the female flowers, 1.5 to 2.2 mm (0.06 to 0.09 in) long, are slightly shorter. The nectaries are inconspicuous. The capsular fruit is 2 to 2.5 mm (0.08 to 0.1 in) long. The species is distinguished from others of this endemic Hawaiian genus by the length of the sepals and nectaries and the flowering stalk exclusively with stalkless glands (Wagner *et al.* 1999).

Schiedea kealiae has been observed in flower in December. A series of self-pollinations, intra-populational crosses, and crosses among populations have demonstrated that many related *Schiedea* sp. experience moderately strong inbreeding depression. These results indicate that reductions in population size could result in expression of inbreeding depression among seedlings, with potentially deleterious consequences for the long

term persistence of this species. Individuals of *Schiedea kealiae* appear to be long-lived, however there is no evidence of regeneration from seed under field conditions. Seedlings of *Schiedea* species occurring in mesic or wet sites are apparently consumed by introduced slugs and snails, which have been observed feeding on *Schiedea membranacea*, a mesic forest species from Kauai. *Schiedea* occurring in dry areas produce abundant seedlings following winter rains, presumably because dry areas have fewer alien predators (Service 1998b; Weller and Sakai, unpublished data).

Historically, *Schiedea kealiae* was known from the northern Waianae Mountains and one collection from the Palikea area, near the southern end of the same mountain range. Currently, four populations totaling between 265 and 315 plants are located on the cliffs above Dillingham Airfield and Camp Erdman and at Kaena Point at the northern end of the Waianae Mountains. These populations occur on private and State lands, and State lands under Federal jurisdiction (HINHP Database 2001; GDSI 2001; U.S. Army (Army) 2001b).

Schiedea kealiae is usually found on steep slopes and cliff faces and bases in dry remnant *Erythrina sandwicensis* forest at elevations between 46 and 341 m (151 and 1,118 ft). Associated plant species include *Sicyos* sp. (anunu), *Plumbago zeylanica*, *Lepidium bidentatum* (anaunau), *Lipochaeta remyi* (nehe), *Myoporum sandwicense*, *Hibiscus arnottianus*, *Psydrax odorata*, *Bidens* sp., or *Sida fallax* (HINHP Database 2001).

The major threats to *Schiedea kealiae* are competition with the alien plant species *Schinus terebinthifolius*, *Panicum maximum*, and *Leucaena leucocephala*; predation by introduced slugs and snails; lack of a pollinator; and risk of extinction from naturally-occurring events and/or reduced reproductive vigor due to the small number of existing populations. The Kaena Point population is additionally threatened by naturally-occurring rock slides and fire (Service 1998b; HINHP Database 2001; 61 FR 53089).

Silene perlmanii (NCN)

Silene perlmanii, a member of the pink family (Caryophyllaceae), is a perennial plant with stems that are woody at the base. It usually is much branched from the base and often forms clumps. Stems are 30 to 50 cm (12 to 20 in) long, and leaves are in the shape of narrow ellipses. A few flowers are arranged in clusters at the ends of stems. Each flower has fused sepals with five lobes and white, deeply notched petals. Mature capsules have not been seen. It is the only species of the genus on Oahu and can be distinguished from other *Silene* species by its white petals and a calyx which is more than 19 mm (0.7 in) long and densely covered with short hairs (Wagner *et al.* 1999).

Silene perlmanii flowers in the spring, depending on climatic conditions. Flowers last for a day. Fruits develop in a few weeks. No further information is available on reproductive cycles, specific environmental requirements, or limiting factors (Service 1998b).

Silene perlmanii was discovered in the 1980s and was known from a few individuals in two populations in the southern Waianae Mountains on Federal and privately owned lands. The populations were about 1.6 km (1 mi) apart at Palikea and Palawai Gulch. As of December 1997, no individuals are known to be extant in the wild (GDSI 2001; HINHP Database 2001; Service 1998b; 56 FR 55770). Currently, this species is known only from individuals under propagation at the National Tropical Botanical Garden (G. Koob, pers. comm. 2002).

Silene perlmanii typically grew on steep rocky slopes in *Acacia koa-Metrosideros polymorpha* lowland mesic forest at elevations between 493 and 919 m (1,617 and 3,014 ft) (Service 1998b; HINHP Database 2001; 56 FR 55770).

The major threats to *Silene perlmanii* are competition from the alien plant species *Erigeron karvinskianus*, *Ageratina adenophora*, *Passiflora suberosa*, *Schinus terebinthifolius*, *Myrica faya*, and *Melinis minutiflora*; feral pigs; and the risk of extinction from naturally-occurring events and reduced reproductive vigor due to the small number of individuals (Service 1998b; HINHP Database 2001; 56 FR 55770).

Stenogyne kanehoana (NCN)

Stenogyne kanehoana is a scandent vine in the mint family (Lamiaceae) with stems weakly four-angled, hairy, and 1 to 2 m (3 to 6 ft) long. The leaves are oppositely arranged and are narrowly ovate to oblong-ovate, and thin but densely hairy. The flowers are in clusters of three to six per leaf axil; the petals are fused into a strongly curved tube, white or pale yellow with short, pink, corolla lobes. The fruit consists of four fleshy, black nutlets. *Stenogyne kanehoana* is distinguished from the only other member of the genus occurring on Oahu, *S. kaalae*, primarily by the size and color of its flowers. The flowers of *S. kanehoana* are large, white to yellow, and tipped in pink, while those of *S. kaalae* are small and deep purple (Weller and Sakai 1999).

Stenogyne kanehoana generally flowers from February through March, but flowering depends on precipitation and flowers have been noted from January to as late as April. Fruits mature within 6 weeks. The life span of this species appears to be about 7 to 12 years. No further information is available on reproductive cycles, specific environmental requirements, or limiting factors (Service 1998b).

Stenogyne kanehoana was known from the east ridge of Puu Kanehoa, Waianae Mountains, near the summit of the ridge connecting Puu Kanehoa with Puu Hapapa to the north and Puu Kaua to the south; a distance totaling approximately 2.8 km (1.75 mi). This population consisting of two plants near the summit of Puu Kanehoa on privately owned land was found dead recently. An additional population in Kaluaa Gulch was discovered in 2000 by Joan Yoshioka of TNCH. This population consist of one to six individual plants and is located on private owned land (HINHP Database 2001; GDSI 2001; Service 1998b; 57 FR 20592).

The remnant population of *Stenogyne kanehoana* is found in lowland mesic forest between 559 and 1,168 m (1,834 and 3,831 ft) elevation. Associated native plant species include *Acacia koa*, *Metrosideros polymorpha*, *Psychotria* sp., *Freycinetia arborea*, *Bidens* sp., *Chamaesyce* sp., *Alyxia oliviformis*, *Cibotium* sp., or *Scaevola* sp. (HINHP Database 2001).

The major threats to *Stenogyne kanehoana* are habitat degradation and competition for space, water, light, and nutrients by naturalized, alien species (especially *Clidemia hirta*, *Schinus terebinthifolius*, *Psidium cattleianum*, *Passiflora suberosa*, and *Paspalum conjugatum*). The extremely small number of individual plants and their restricted distribution increases the potential for extinction from naturally-occurring events. Other potential threats which have been suggested include fire and deforestation, but, at present, these probably are not serious threats to the species. Feral pigs, the two spotted leafhopper, and hikers are also thought to be a threat to this species (Service 1998b; HINHP Database 2001; 57 FR 20592).

Tetramolopium filiforme (NCN)

Tetramolopium filiforme, a member of the aster family (Asteraceae), is a dwarf shrub from 5 to 15 cm (2 to 6 in) tall with complexly branched stems. The leaves are much longer than wide; from 1 to 2 cm (0.4 to 0.8 in) long and 0.4 to 1.2 mm (0.02 to 0.05 in) wide. The

flower heads are single or grouped in clusters of two to four, each having a bell-shaped involucre (one or more whorls of bracts situated below and close to a flower, flower cluster, or fruit). There are 35 to 52 white or pale lavender ray florets in a single circle at the edge of the head. There are 18 to 30 maroon (rarely yellow) disk florets in the center of each head. The ray florets are female, while the disk florets function as male flowers. Fruits are achenes (a small dry indehiscent one-seeded fruit). This species is distinguished from the other extant species on Oahu by its separate male and female flowers both on the same plant, and its inflorescence of one to four heads (Lowrey 1999).

In cultivation, *Tetramolopium filiforme* germinates in about 3 weeks. Fifteen weeks after germination, the plants are approximately 9 cm (3.5 in) high and they produce their first buds. The first blossoms are noted about 18 weeks after germination. During growth an inflorescence forms at the apex of each shoot while new shoots develop laterally. *Tetramolopium filiforme* is relatively short-lived and usually lives less than 5 years. In the wild, it usually flowers in the late winter or spring but flowering can also be induced by heavy rainfall (Service 1998b).

Historically, *Tetramolopium filiforme* was known from the northern Waianae Mountains, from Ohikilolo Ridge, Keaau Valley, and Makaha Valley. This species remains in Keaau Valley, Kahanahaiki Valley, Makua-Keaau Ridge, Lualualei, Waianae Kai and Puu Kawiwi on Federal, State, city, and county lands. The six known populations are estimated to contain approximately 253 individuals (HINHP Database 2001; EDA Database 2001; GDSI 2001).

Tetramolopium filiforme typically grows on dry cliff faces and ridges in dry and mesic forests at elevations of 247 to 978 m (810 to 3,208 ft). Associated species include *Bidens torta*, *Carex meyenii*, *Peperomia tetraphylla* (ala ala wai nui), *Schiedea* sp., *Sida fallax*, *Dodonaea viscosa*, *Artemisia australis*, or *Schiedea mannii* (HINHP Database 2001).

The major threats to *Tetramolopium filiforme* are habitat degradation by feral goats; competition from the alien plant species *Ageratina riparia*, *Lantana camara*, *Melinis repens*, *Acacia confusa*, *Kalanchoe pinnata*, *Schinus terebinthifolius*, *Leucaena leucocephala*, *Melinis minutiflora*, and *Erigeron karvinskianus*; fire; military activities; and a risk of extinction from naturally-occurring events and/or reduced reproductive vigor due to the small number of remaining populations and trampling or collection by humans on or near trails (Service 1998b; HINHP Database 2001).

Tetraplasandra gymnocarpa (Oheohe)

Tetraplasandra gymnocarpa, a member of the ginseng family (Araliaceae), is a tree 2.5 to 10 m (8 to 33 ft) tall, either hairless or with fuzzy, short-lived hairs on the young leaves and flower clusters. The leaves have seven to 21 leathery, oval to elliptic leaflets per leaf. Each leaflet is folded upward along the midvein. The flowers are usually arranged in threes or in an umbrella-shaped arrangement. Petals usually number five or six per flower, with an equal number of stamens. The ovary, which usually has three or four sections, appears placed atop the receptacle (base of the flower) in a superior position, due to the expansion of the ovary disk (outgrowth of the receptacle) and the reduction of the hypanthium (basal portion of the flower). Fruits are purplish, oval or top-shaded drupes, that enclose a papery endocarp and single seeds. *Tetraplasandra gymnocarpa* is distinguished from all other species in the genus in that its ovary appears fully superior (Lowrey 1999).

This species was observed in flower and fruit in November 1991 and in fruit in May and September. No further information exists on reproductive cycles, longevity, specific environmental requirements, or limiting factors (Service 1998b).

Tetraplasandra gymnocarpa was historically known from Punaluu, Waikakalaua Gulch, Mount Olympus, and the region between Niu and Wailupe, all in the Koolau Mountains of Oahu. This species was also sighted in the Waianae Range at Palikea in 1954. Currently, 20 populations are scattered along the summit ridges of the Koolau Mountains from the region of Paumalu at the northern extreme to Kuliouou and Waimanalo at the southeastern most point, on Federal, State, city, and county lands. Fewer than 100 individuals are known (HINHP Database 2001; GDSI 2001; EDA Database 2001).

Tetraplasandra gymnocarpa is typically found on windswept summit ridges, slopes, or in gullies in wet or sometimes mesic lowland forests and shrublands between elevations of 93 and 959 m (305 and 3,146 ft). Associated plant species include *Cheirodendron* sp., *Antidesma platyphyllum, Syzygium sandwicensis, Hedyotis terminalis, Diplopterygium pinnatum, Melicope* spp., *Tetraplasandra oahuensis* (ohe mauka), *Bobea elaitor, Acacia koa, Cibotium chamissoi, Lobelia hypoleuca* (NCN), *Myrsine fosbergii* (kolea), *Pouteria sandwicensis, Wikstroemia* sp., *Sadleria* sp., *Metrosideros polymorpha, Cheirodendron* sp., *Dicranopteris linearis, Machaerina angustifolia, Freycinetia arborea, Broussaisia arguta, Psychotria* spp., *Labordia* sp., *Hedyotis fosbergii* (manono), *Bidens* sp., *Dubautia laxa, Cibotium* sp., or the endangered *Cyanea humboldtiara* (Service 1998b; HINHP Database 2001; 59 FR 14482).

The major threats to *Tetraplasandra gymnocarpa* are competition with the alien plant species *Pterolepis glomerata, Aleurites moluccana, Eucalyptus* sp. (gum tree), *Setaria palmifolia, Araucaria columnaris* (Norfolk Island pine), *Ardisia elliptica* (shoebutton ardisia), *Sacciolepis indica, Erigeron karvinskianus, Axonopus fissifolius, Paspalum conjugatum, Clidemia hirta* and *Psidium cattleianum;* the two spotted leafhopper; habitat degradation by feral pigs; and reduced reproductive vigor due to the species' limited gene pool, a consequence of the small number of extant individuals (Service 1998b; HINHP Database 2001; 59 FR 14482).

Trematolobelia singularis (NCN)

Trematolobelia singularis, a member of the bellflower family (Campanulacea), is an unbranched shrub with stems 0.6 to 1.5 m (2 to 5 ft) long. The long and narrow leaves are 10 to 18 cm (4 to 7 in) long and 1 to 1.8 cm (0.4 to 0.7 in) wide. The unbranched, erect flowering stalk is 20 to 42 cm (8 to 16.5 in) long. The violet petals are about 5 cm (0.2 in) long and collectively form a three-lobed tube. The largest lobe is curved downward and the other two are bent backward, giving the appearance of two lips. The capsules are almost round and contain numerous small, wind-dispersed seeds. This species differs from others of this endemic Hawaiian genus by the unbranched, erect flowering stalk (Lammers 1999).

This species has been observed in flower in October. No additional information exists on reproductive cycles, longevity, specific environmental requirements, or limiting factors (Service 1998b).

Trematolobelia singularis has been reported only from the southern Koolau Mountains. Approximately 165 plants are known from three populations Moanalua-Tripler Ridge summit to Puu Keahiakahoe, Konahuanui, and Puu Lanipo. These populations are found on State and private lands (HINHP Database 2001; GDSI 2001).

This species usually grows on steep, windswept cliff faces or slopes in *Metrosideros polymorpha-Dicranopteris*

linearis lowland wet shrubland from 545 to 953 m (1,788 to 3,126 ft) elevation. Associated plant species include *Eugenia* sp.(nioi), *Wikstroemia* sp., *Melicope* sp., *Sadleria* sp., *Cibotium* sp., *Broussaisia arguta,* or *Dubautia laxa* (Service 1998b; HINHP Database 2001; 61 FR 53089).

The threats to *Trematolobelia singularis* are habitat degradation by feral pigs; potential predation by rats and slugs; competition with the aggressive alien plant species *Clidemia hirta;* and risk of extinction from naturally-occurring events and/or reduced reproductive vigor due to the small number of extant populations are serious (Service 1998b; HINHP Database 2001; 61 FR 53089).

Urera kaalae (Opuhe)

Urera kaalae, a member of the nettle family (Urticaceae), is a small tree or shrub 3 to 7 m (10 to 23 ft) tall. The sap of the plant becomes greenish black when exposed to air. The leaves are pale green, thin and membranous, heart-shaped, 10 to 27 cm (4 to 11 in) long by 5 to 13 cm (2 to 5 in) wide, with three main veins and toothed margins. The flowers are either male or female and may grow on the same or different plants. They are arranged in three-branched inflorescences. Sepals of male flowers are fused into rather globe-shaped structures about 1.5 mm (0.06 in) long. Sepals of female flowers are less than 1 mm (0.04 in) long, and the inner pair becomes slightly fleshy to enclose the achene along about half of its 1 mm (0.04 in) length. This species can be distinguished from the other Hawaiian species of the genus by its heart-shaped leaves (Wagner *et al.* 1999).

Urera kaalae has been observed flowering in the spring. It is difficult to predict when seeds will be produced, and, when they are produced, they are often sterile. This may be an indication of pollinator limitation. The plants are fast-growing. No further information is available on reproductive cycles, specific environmental requirements, or limiting factors (Service 1998b).

Historically, *Urera kaalae* was known from the central to southern windward Waianae Mountains, from Waianae Uka to Kupehau Gulch. This species now occurs only in North and South Ekahanui, Pualii Gulch, Napepeiauolelo, Halona, and Kaluaa Gulches, North and South Palawai, Puu Hapapa, Napepeiauolelo Gulch, and Waianae Kai on Federal, State, and private lands. The 11 known populations contain approximately 41 individuals (HINHP Database 2001; GDSI 2001; EDA Database 2001).

Urera kaalae typically grows on slopes and in gulches in diverse mesic forest at elevations of 439 to 1,074 m (1,440 to 3,523 ft). Associated species include *Hibiscus* sp., *Alyxia oliviformis, Canavalia* sp., *Charpentiera* sp., *Senna gaudichaudii* (kolomona), *Claoxylon sandwicense, Pleomele* sp., *Xylosma hawaiiense, Chamaesyce* sp., *Antidesma platyphyllum, Athyrium* sp., *Streblus pendulinus, Hedyotis acuminata, Asplenium kaulfusii, Doryopteris* sp., *Pouteria sandwicensis, Freycinetia arborea, Pipturus albidus, Urera glabra, Psychotria* sp., *Diospyros hillebrandii,* or *Nestegis sandwicensis* (Service 1998b; 61 FR 53089; HINHP Database 2001; Wagner *et al.* 1999).

The major threats to *Urera kaalae* are habitat degradation by feral pigs; competition from the alien plant species *Psidium guajava, Pimenta dioica, Buddleia asiatica, Thelypteris parasitica, Rubus rosifolius, Clidemia hirta, Passiflora suberosa, Heliocarpus popayaensis, Schinus terebinthifolius, Myrica faya, Passiflora subcordata, Melinis minutiflora,* and *Psidium cattleianum;* fire; rockslides; and the small number of extant individuals and a risk of extinction from naturally occurring events and/or reduced reproductive vigor due to the small number of remaining individuals (Service 1998b; 61 FR 53089; HINHP Database 2001).

Viola chamissoniana ssp. *chamissoniana* (Olopu)

Viola chamissoniana ssp. *chamissoniana,* a member of the violet family (Violaceae), is a branched shrub up to 90 cm (3 ft) tall. The toothed leaves, usually clustered at branch tips, are triangular-oval to heart-shaped in outline. Each flowering stalk produces one or two flowers with five sepals and five white, purple-tinged petals. Capsules contain dark brown to almost black seeds. This subspecies can be distinguished from the other members of the genus in the Waianae Mountains by the small size of its leaves (Wagner *et al.* 1999).

Viola chamissoniana ssp. *chamissoniana* has been observed in fruit and flower in April, August and October. No further information is available on flowering cycle, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, or limiting factors (Service 1998b).

Historically, *Viola chamissoniana* ssp. *chamissoniana* was known from the central and southern Waianae Mountains and Makaleha Valley. This taxon now occurs on Kamaileunu Ridge, Palikea Ridge (between Nanakuli and Lualualei), Puu Hapapa, Makua-Keaau Ridge, Halona, and Puu Kumakalii on Federal, State, city, and county lands. The five known populations contain 59 individuals (HINHP Database 2001; EDA Database 2001; GDSI 2001).

Viola chamissoniana ssp. *chamissoniana* typically grows on dry cliffs, rocky ledges, and steep slopes in mesic shrubland and cliff vegetation at elevations of 414 to 1,149 m (1,358 to 3,769 ft). Associated species include *Sida fallax, Chamaesyce* sp., *Dodonaea viscosa, Schiedea sp., Dubautia* sp., *Peperomia* sp., *Lipochaeta tenuis, Rumex* sp., *Artemisia australis, Bidens torta, Carex meyenii, Eragrostis* sp., *Metrosideros polymorpha,* or *Styphelia tameiameiae* (pukiawe) (Service 1998b; 56 FR 55770; HINHP Database 2001).

The major threats to *Viola chamissoniana ssp. chamissoniana* are habitat degradation by feral goats and pigs; competition from the alien the plant species *Myrica faya, Schinus terebinthifolius, Erigeron karvinskianus, Ageratina adenophora, Ageratum riparia,* and *Melinis minutiflora;* fire; landslides; and the small number of extant individuals and a risk of extinction from naturally occurring events and/or reduced reproductive vigor due to the small number of remaining individuals (Service 1998b; 56 FR 55770; HINHP Database 2001).

Viola oahuensis (NCN)

Viola oahuensis, a member of the violet family (Violaceae), is usually an erect, unbranched subshrub 6 to 40 cm (2.4 to 16 in) tall. The papery-textured leaves are elliptic-egg-shaped to elliptic. The leaf stalks are typically 0.5 to 1 cm (0.2 to 0.4 in) long. The narrowly triangular stipules (either pair of appendages borne at the base of the leaf in many plants) have fringed edges. One to two flowers are borne on stalks typically 25 to 60 mm (1 to 2.4 in) long. The petals are pale yellow, the upper ones 8 to 13 mm (0.3 to 0.5 in) long, the lateral ones 10 to 13.5 mm (0.4 to 0.5 in) long, and the lower one 12 to 16 mm (0.5 to 0.6 in) long. The capsules are 9 to 16 mm (0.4 to 0.6 in) long. This species is distinguished from other Hawaiian members of the genus by the stipule characters, the length of the leaf stalks, and the length and papery texture of the leaves (Wagner *et al.* 1999).

Viola oahuensis has been observed flowering in August and September. No further information is available on reproductive cycles, longevity, specific environmental requirements, or limiting factors (Service 1998b).

Historically, *Viola oahuensis* was known from 17 populations in the Koolau Mountains of Oahu scattered

over about a 37 km (23 mi) distance from Puu Kainapuaa to Palolo. The nine extant populations, which total fewer than 200 individuals, are now found from the Kawainui-Koloa summit divide to the Waimalu-Koolaupoko divide. These populations are found on Federal, State, and private lands (HINHP Database 2001; GDSI 2001; EDA Database 2001).

Viola oahuensis is generally found on exposed, windswept ridges of moderate to steep slope in wet *Metrosideros polymorpha-Dicranopteris linearis* shrublands and *Metrosideros polymorpha* mixed montane bogs in the cloud zone from 415 to 959 m (1,361 to 3,146 ft) elevation. This species typically grows among wind-stunted *Broussaisia arguta, Cibotium* sp., *Labordia* sp., *Dubautia laxa, Wikstroemia* sp., *Hedyotis terminalis, Antidesma* sp., *Syzygium sandwicensis, Melicope* sp., *Bidens macrocarpa, Machaerina* sp., *Sadleria* sp., or *Vaccinium* sp. (Service 1998b; HINHP Database 2001; 61 FR 53089).

The primary threats to *Viola oahuensis* are habitat degradation and/or destruction by feral pigs; potential impacts from military activities; competition with *Pterolepis* sp. (NCN), *Axonopus fissifolius, Clidemia hirta, Psidium cattleianum,* and *Paspalum conjugatum;* and risk of extinction from naturally-occurring events and/or reduced reproductive vigor due to the small number of populations (Service1998b; HINHP Database 2001; 61 FR 53089).

Multi-Island Species

Adenophorus periens (Pendant kihi fern)

Adenophorus periens, a member of the grammitis family (Grammitidaceae) and a short-lived perennial, 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 (a leaflet or primary division of a pinnate leaf or frond) 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. 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 in the habitats where this species is found, 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. Additional information on reproductive cycles, longevity, specific environmental requirements, and limiting factors is not available (Linney 1989).

Historically, *Adenophorus periens* was known from Kauai, the Koolau Mountains of Oahu, Lanai, Maui, and the island of Hawaii. Currently, it is known from several locations on Kauai, Molokai, and Hawaii. This species is no longer extant on the island of Oahu. It was collected in 1909 on the west ridge of Palolo crater and the west ridge of Palolo Valley (HINHP Database 2001).

Adenophorus periens grows epiphytically on trees in *Metrosideros polymorpha* and *Metrosideros rugosa* wet forests between 309 and 867 m (1,014 and 2,844 ft) elevation. Associated native plant species include *Dicranopteris linearis, Cheirodendron* spp., *Machaerina angustifolia, Syzygium sanwicensis, Hedyotis terminalis,* or *Cibotium* sp. (HINHP Database 2001).

The threats to *Adenophorus periens* are habitat degradation by feral pigs and goats and competition with the alien plant species *Psidium cattleianum* (Service 1999; 59 FR 56333; HINHP Database 2001).

Alectryon macrococcus (Mahoe)

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, leaves with one to five pairs of sometimes asymmetrical egg-shaped leaflets. The underside of the leaf has dense brown hairs, only when young in *A. macrococcus* var. *macrococcus,* and whether young or mature (persistent) in *A. macrococcus* var. *auwahiensis. Alectryon macrococcus* var. *auwahiensis* is only found on the island of Maui. The only member of its genus found in Hawaii, this species is distinguished from other members of its family by being a tree with a hard fruit 2.5 cm (1 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 this species. Flowering cycles, pollination vectors, seed dispersal agents, and specific environmental requirements are unknown (Service 1997).

Currently and historically, *Alectryon macrococcus* var. *macrococcus* occurs on Kauai, Oahu, Molokai, and Maui. On Oahu, there are a total of 34 populations containing around 300 individuals. These populations are found in Kapuna Gulch, Huliwai Gulch, Kaluaa Gulch, Ekahanui Gulch, Manuwai Gulch, Mohiakea Gulch, Makua Valley, Puu Ku Makalii, Nanakuli-Lualualei Ridge, Palikea Gulch, Makaha, Pahole Gulch, Makaleha Valley, Waianae Kai, Waieli Gulch, Kaluakauila Gulch, Kaaua Gulch, Puu Hapapa, Mikilua subdistrict, Kaawa Gulch, and Napepeiauolelo Gulch on Federal, State, city, county, and private lands (HINHP Database 2001; GDSI 2001; EDA Database 2001; Wagner *et al.* 1999; EDA, *in litt.* 2001).

Alectryon macrococcus var. *macrococcus* grows on slopes, ridges, or in gulches within mesic lowland forests between elevations of 367 and 941 m (1,204 and 3,086 ft). Associated native plant species include *Pisonia sandwicensis, Elaeocarpus bifidus, Streblus pendulinus, Psychotria hathewayi, Pouteria sandwicensis, Pisonia umbellifera, Diplazium sandwichianum, Claoxylon sandwicense, Neraudia* sp., *Pipturus albidus, Diospyros hillebrandii, Charpentiera* sp., *Hibiscus arnottianus, Metrosideros polymorpha, Diospyros sandwicensis, Nestegis sandwicensis, Pisonia* sp., *Xylosma* sp., *Antidesma platyphyllum, Myrsine lanaiensis, Psydrax odorata, Canavalia* sp., or *Alyxia oliviformis* (HINHP Database 2001).

The threats to *Alectryon macrococcus* var. *macrococcus* on Oahu are impacts of feral goats and pigs; impacts of the alien plant species *Heliocarpos popayanensis, Toona ciliata, Syzygium cumini, Aleurites moluccana, Blechnum occidentale, Oplismenus hirtellus, Psidium guajava, Melinus minutiflora, Clidemia hirta, Pennisetum clandestinum* (kikuyu grass), *Buddleia asiatica, Thelypteris parasitica, Rubus rosifolius, Passiflora suberosa, Lanatana camara, Schinus terebinthifolius,* and *Psidium cattleianum;* damage from the black twig borer; seed predation by rats, mice (*Mus domesticus*), and insects; fire; depressed reproductive vigor; loss of pollinators; depressed reproductive vigor; and due to the very small remaining number of individuals and their limited distribution, a single natural or human-caused environmental disturbance could easily be catastrophic (Service 1997; 57 FR 20772).

Bonamia menziesii (NCN)

Bonamia menziesii, a member of the morning glory family (Convolvulaceae) and a short-lived perennial, 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 *Bonamia menziesii.* Reproductive cycles, longevity, specific environmental requirements, and limiting factors are unknown (Service 1999).

Historically, *Bonamia menziesii* was known from Kauai, the Waianae Mountains of Oahu, Molokai, Maui, and the Island of Hawaii. Currently, this species is extant on Kauai, Oahu, Lanai, Maui, and the Island of Hawaii. There are 16 total populations containing a total of fewer than 100 individual plants on Oahu. On Oahu, populations are found in Niu Valley, Makaleha Valley, Makua-Keaau Ridge, Wailupe, Waialae Nui-Kapakahi Ridge and Kapakahi Gulch, Kaluakauila Gulch, Keawaula, Hawaii loa Ridge and Kului Gulch, Nanakuli Valley, Kuaokala, Halona, Waialae Iki, Kapuna Gulch, Mikilua, Waianae Kai, and Alaiheihe Gulch on Federal, State, and private lands (HINHP Database 2001; GDSI 2001; EDA Database 2001).

Bonamia menziesii is found on steep slopes or level ground in dry or mesic forest in open or closed canopy at elevations between 31 and 809 m (102 and 2,654 ft). Associated species include *Alyxia oliviformis, Pleomele* sp., *Sida fallax, Waltheria indica, Erythrina sandwicensis* (wili wili), *Rauvolfia sandwicensis, Sicyos* sp., *Acacia koa, Styphelia tameiameiae, Dodonaea viscosa, Metrosideros polymorpha, Psydrax odorata, Dianella sandwicensis* (ukiuki), *Diospyros sandwicensis, Hedyotis terminalis, Melicope anisata* (mokihana), *Melicope barbigera* (alani), *Myoporum sandwicense, Nestegis sandwicensis, Pisonia* sp., *Pittosporum* sp., *Pouteria sandwicensis,* or *Sapindus oahuensis* (HINHP Database 2001; Service 1999).

The primary threats to *Bonamia menziesii* on Oahu are habitat degradation and possible predation by wild and feral pigs, goats, and cattle; competition with the alien plant species *Pennisetum setaceum* (fountain grass), *Passiflora suberosa, Aleurites moluccana, Psidium cattleianum, Montanoa hibiscifolia, Schinus terebinthifolius, Grevillea robusta, Toona ciliata, Pimenta dioica, Kalanchoe pinnata, Panicum maximum, Melia azerdarach, Syzygium cumini, Leucaena leucocephala, Lantana camara, Hyptis pectinata,* and *Rivina humilis;* fire; an alien bug (*Physomerus grossipes*); and military activities (59 FR 56333; Service 1999; HINHP Database 2001).

Cenchrus agrimonioides (Kamanomano)

Cenchrus agrimonioides, a member of the grass family (Poaceae) and a short-lived perennial, is a grass with leaf blades which are flat or folded and have a prominent midrib. There are two varieties, *Cenchrus agrimonioides* var. *laysanensis* and *Cenchrus agrimonioides* var. *agrimonioides.* They differ from each other in that var. *agrimonioides* has smaller burs, shorter stems, and narrower leaves. *Cenchrus agrimonioides* var. *laysanensis* is only known from the Northwest Hawaiian Islands. This species is distinguished from others in the genus by the cylindrical to lance-shaped bur and the arrangement and position of the bristles (O'Conner 1999).

Little is known about the life history of *Cenchrus agrimonioides.* Reproductive cycles, longevity, specific environmental requirements, and limiting factors are generally unknown, however, this species has been observed to produce fruit year round (Service 1999).

Historically, *Cenchrus agrimonioides* var. *agrimonioides* was known from the Waianae Mountains of Oahu, Lanai, and Maui. This variety is currently extant on Oahu and Maui. Currently, *Cenchrus agrimonioides* var. *agrimonioides* is known from a total of eight populations containing between 113 and 118 individuals on Oahu. On Oahu, populations are found in the Pahole Gulch, on the Makaha-Waianae Kai Ridge, in or near Kahanahaiki Gulch, in east Makaleha, Puu Kaua, Huliwai Gulch, and in the Pualii Drainage, on Federal, State, city, county, and private lands (HINHP Database 2001; GDSI 2001; EDA Database 2001; 61 FR 53108; Service 1999).

Cenchrus agrimonioides var. *agrimonioides* is usually found on dry upper slopes, or ridges in lowland mixed mesic forest at elevations between 357 and 890 m (1,171 and 2,919 ft). Associated plant species include *Acacia koa, Metrosideros polymorpha, Alyxia oliviformis, Psydrax odorata, Diospyros sandwicensis, Carex wahuensis, Nestegis sandwicensis, Psychotria* sp., *Bobea* sp., *Chamaesyce multiformis, Gahnia beecheyi* (NCN), *Coprosma foliosa, Styphelia tameiameiae,* or *Eragrostis variabilis* (HINHP Database 2001; EDA, *in litt.* 2001).

The major threats to *Cenchrus agrimonioides* var. *agrimonioides* on Oahu are habitat degradation and/or destruction by feral pigs; competition with the alien plant species *Schinus terebinthifolius, Blechnum occidentale, Ageratina riparia, Psidium cattleianum, Grevillea robusta, Passiflora suberosa, Clidemia hirta, Casuarina* sp. (ironwood), *Paspalum conjugatum,* and *Rubus argutus;* trampling and fire from military activities; and a risk of extinction from naturally occurring events and/or reduced reproductive vigor due to the small number of existing individuals (Service 1999; 61 FR 53108; HINHP Database 2001).

Centaurium sebaeoides (Awiwi)

Centaurium sebaeoides, a member of the gentian family (Gentianaceae), is an annual herb with fleshy leaves and stalkless flowers. This species is distinguished from *Centaurium erythraea,* 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. Flowering may be induced by heavy rainfall. Populations are found in dry areas, and plants are more likely to be found following heavy rains (56 FR 55770).

Historically, *Centaurium sebaeoides* was known from Kauai, Oahu, Molokai, Lanai, and Maui. This species is currently extant on Kauai, Maui, Lanai, and Oahu. Currently on Oahu, three populations of this species remains with a total of between 60 and 80 individuals at Kaena Point, Koko Head, and on the slopes above Halona Point on State, private, city, and county lands (HINHP Database 2001; Service 1999; Wagner *et al.* 1999).

Centaurium sebaeoides typically grows in volcanic or clay soils or on cliffs in arid coastal areas or on coral plains below 368 m (1,207 ft) elevation. Associated species include *Artemisia* sp., *Bidens* sp., *Jacquemontia ovalifolia, Lipochaeta succulenta* (nehe), or *Lysimachia* sp. (kolokolo kuahiwi) (HINHP Database 2001; 56 FR 55770; Wagner *et al.* 1999).

The major threats to *Centaurium sebaeoides* on Oahu are habitat degradation by feral goats and cattle; competition from the alien plant species *Leucaena leucocephala;* trampling by humans on or near trails; and fire (56 FR 55770; Service 1999).

Colubrina oppositifolia (Kauila)

Colubrina oppositifolia, a member of the Buckthorn family (Rhamnaceae) and

a long-lived perennial, is a tree with extremely hard red wood. This species is readily distinguished from the other species in Hawaii by several characters opposite leaf position, dull leaf surface, and entire leaf margins (Wagner *et al.* 1999).

Colubrina oppositifolia was observed in fruit and flower during September and June, and in flower during December and January. No other life history information is currently available (HINHP Database 2001).

Historically, *Colubrina oppositifolia* was known from Oahu, Maui and the island of Hawaii. This species now occurs on the island of Hawaii, Oahu, and Maui. Currently there are a total of five populations containing a total of 61 individuals on Oahu. On Oahu, populations are found in Kaumokunui Gulch, Makaleha Valley, and Manuwai Gulch on State and private lands (HINHP Database 2001; GDSI 2001).

Habitats of *Colubrina oppositifolia* are lowland dry and mesic forests dominated by *Diospyros sandwicensis,* found at elevations between 277 and 761 m (909 and 2,496 ft). Associated native species include *Alyxia oliviformis, Nestegis sandwicensis, Sapindus oahuensis, Psydrax odorata,* or *Reynoldsia sandwicensis* (HINHP Database 2001).

The threats to this species on Oahu are habitat destruction by feral pigs and goats; competition with the alien plant species *Syzygium cumini, Psidium cattleianum, Aleurites moluccana, Lantana camara, Pennisetum setaceum,* and *Schinus terebinthifolius;* the introduction of black twig borer; Chinese rose beetles; fire; small population numbers; limited distributions; and disturbance by military and unauthorized personnel (59 FR 10305; Service 1996c; HINHP Database 2001).

Ctenitis squamigera (Pauoa)

Ctenitis squamigera, a member of the wood fern family (Aspleniaceae), has a rhizome creeping above the ground that is densely covered with scales similar to those on the lower part of the leaf stalk. It can be readily distinguished from other Hawaiian species of *Ctenitis* by the dense covering of tan colored scales on its frond (Degener and Degener 1957).

Reproductive cycles, longevity, specific environmental requirements, and limiting factors are unknown for *Ctenitis squamigera* (Service 1998a).

Historically, *Ctenitis squamigera* was recorded from Kauai; Kaluanui, southeast of Kahana Bay, Pauoa, Nuuanu, Niu, and Wailupe in the Koolau Mountains, Mt. Kaala NAR and Schofield Barracks in the Waianae Mountains of Oahu; Molokai; Maui; and the island of Hawaii. This species is currently extant on Oahu, Molokai, Lanai, and Maui. Currently on Oahu, four populations with more than 80 individuals are found in the Waianae Mountains in Makaleha Valley, Kaaawa Gulch, Makua Valley and Waianae Kai Forest Reserve on Federal, State, and private lands (HINHP Database 2001; GDSI 2001; EDA Database 2001).

Ctenitis squamigera is found on gentle to steep slopes in *Metrosideros polymorpha/Diospyros sandwicensis* mesic forest and diverse mesic forest at elevations of 387 to 923 m (1,269 to 3,027 ft). Associated native plant taxa include *Alyxia oliviformis, Hibiscus* sp., *Diospyros hillebrandii, Nestegis sandwicensis, Psydrax odorata, Pouteria sandwicensis, Carex meyenii, Dodonaea viscosa, Freycinetia arborea, Pisonia* sp., *Dryopteris unidentata, Doodia kunthiana, Myrsine* sp., *Psychotria* sp., or *Xylosma* sp. (HINHP Database 2001).

The primary threats to *Ctenitis squamigera* on Oahu are habitat degradation by feral pigs and goats; competition with the alien plant species, *Blechnum occidentale, Ageratina riparia, Toona ciliata, Clidemia hirta, Aleurites moluccana, Syzygium cumini, Psidium guajava, Psidium cattleianum* and *Schinus terebinthifolius;* fire; decreased reproductive vigor and extinction caused by naturally occurring events due to the small number of existing populations (Service 1998a; HINHP Database 2001; 59 FR 49025).

Cyanea grimesiana ssp. *grimesiana* (Haha)

Cyanea grimesiana ssp. *grimesiana,* a member of the bellflower family (Campanulaceae) and a short-lived perennial, is a shrub with pinnately divided leaves. This species is distinguished from others in this endemic Hawaiian genus by the pinnately lobed leaf margins and the width of the leaf blades. This subspecies is distinguished from the other two subspecies by the shape and size of the calyx lobes which overlap at the base (Lammers 1999).

Little is known about the life history of *Cyanea grimesiana* ssp. *grimesiana.* Reproductive cycles, longevity, specific environmental requirements, and limiting factors are unknown (Service 1999).

Currently and historically, *Cyanea grimesiana* ssp. *grimesiana* is known from the Waianae and Koolau Mountains on Oahu, Molokai, Lanai, and Maui. On Oahu, there are populations known from Palikea Gulch, North Haleauau Gulch, Pahole NAR, Pia Gulch, Kului Gulch, and in Waialae Iki-Kapakahi on Federal, State, city, county, and private lands in a total of six populations containing nine individuals (HINHP Database 2001; GDSI 2001; EDA Database 2001).

Cyanea grimesiana ssp. *grimesiana* is typically found in mesic forest often dominated by *Metrosideros polymorpha* or *Metrosideros polymorpha* and *Acacia koa,* or on rocky or steep slopes of stream banks, at elevations between 114 and 746 m (374 and 2,447 ft). Associated plant species include *Cyanea angustifolia* (haha), *Joinvillea* sp. (ohe), *Clermontia persicaefolia* (oha wai), *Melicope* sp., *Dicranopteris linearis, Coprosma* sp., *Alyxia oliviformis, Syzygium sandwicensis, Diplazium sandwichianum, Antidesma* sp., *Bobea* sp., *Myrsine* sp., *Nestegis sandwicensis, Psychotria* sp., or *Xylosma* sp. (61 FR 53108; Service 1999).

The threats to *Cyanea grimesiana* ssp. *grimesiana* on Oahu are habitat degradation and/or destruction caused by wild and feral goats and pigs; competition with the alien plant species, *Clidemia hirta, Psidium cattleianum,* and *Toona ciliata;* random naturally occurring events causing extinction due to the small number of existing individuals; fire; trampling by hikers and/or military activities; landslides; rats; and predation by various species of slugs (61 FR 53108; Service 1999).

Cyperus trachysanthos (Puukaa)

Cyperus trachysanthos, a member of the sedge family (Cyperaceae), is a perennial grass-like plant with a short rhizome (underground stem). The culms (aerial stems) 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 *Cyperus trachysanthos.* Reproductive cycles, longevity, specific environmental requirements, and limiting factors are unknown (Service 1999).

Historically, *Cyperus trachysanthos* was known from Niihau, Kauai, scattered locations on Oahu, Molokai, and Lanai. This species is now extant on Kauai and Oahu. On Oahu, it is known from the Kaena Point NAR, nearby Manini Gulch, State land at Diamond Head, Makapuu, Queens Beach, and the Kawainui Marsh area, on Federal, State, and private lands. There are six

populations with a total of 40 individuals on Oahu (HINHP Database 2001; Service 1999)

Cyperus trachysanthos is usually found in wet sites (mud flats, wet clay soil, seasonal ponds, or wet cliff seeps) on coastal cliffs or talus slopes at elevations above 248 m (813 ft). Associated native species include *Hibiscus tiliaceus* (hau) (Service 1999; Koyama 1999; 61 FR 53108; HINHP Database 2001).

The threats to *Cyperus trachysanthos* on Oahu are a risk of extinction from naturally occurring events due to the small number of populations; competition with alien plant species; feral goats; fire; off-road vehicles to all populations; and pumping of wetlands for flood and mosquito control; modifications to the wetland topography; mowing; herbicide application; and run-off from nearby Hawaii Army National Guard (HIARNG) activities such as the cleaning of vehicles, dumping of paints or thinners, or the use of pesticides to the Diamond Head population (61 FR 53108; Service 1999).

Diellia erecta (NCN)

Diellia erecta, a member of the spleenwort family (Aspleniaceae) and a short-lived perennial, is a fern that grows in tufts of three to nine lance shaped fronds which emerge from a rhizome covered with brown to dark gray scales. This species differs from other members of the genus in having brown or dark gray scales usually more than 2 cm (0.8 in) in length, fused or separate sori (one of the dots on the underside of a fertile fern frond consisting of a cluster of spores) along both margins, shiny black midribs that have a hardened surface, and veins that do not usually encircle the sori (Degener and Greenwell 1950; Wagner 1952).

Little is known about the life history of *Diellia erecta.* Reproductive cycles, longevity, specific environmental requirements, and limiting factors are unknown (Service 1999).

Historically, *Diellia erecta* was known from Kauai; the Koolau Mountains on Oahu; Molokai; Lanai; Maui; and the island of Hawaii. Currently, it is known from Molokai, Maui, Oahu, and Hawaii. On Oahu, it is known from a single population containing at least 20 plants on Hawaii Loa Ridge on State and private lands (HINHP Database 2001; GDSI 2001).

Diellia erecta is found on moderate to steep gulch slopes or sparsely vegetated rock faces in mesic forest at elevations between 118 and 550 m (387 and 1,804 ft). Associated native plant species include *Sapindus oahuensis, Psydrax odorata, Coprosma* sp., *Dodonaea viscosa, Dryopteris unidentata, Myrsine* sp., *Psychotria* sp., *Syzygium sandwicensis,* or *Wikstroemia* sp. (HINHP Database 2001; Service 1999).

The major threats to *Diellia erecta* on Oahu are habitat degradation by pigs; competition with alien plant species, including *Blechnum occidentale, Psidium cattleianum, Schinus terebinthifolius, Cordyline fruticosa, Oplismenus hirtellus, Schefflera actinophylla, Clidemia hirta,* and *Phymatosorus scolopendria* (NCN); and random naturally occurring events causing extinction and/or reduced reproductive vigor due to the small number of existing individuals (HINHP Database 2001; 59 FR 56333; Service 1999).

Diplazium molokaiense (NCN)

Diplazium molokaiense, a member of the woodfern family (Dryopteridaceae), has a short prostrate rhizome. The leaf stalks are 15 to 20 cm (6 to 8 in) long and green or straw colored. The frond is thin textured, ovate-oblong, 15 to 50 cm (6 to 20 in) long and 10 to 15 cm (4 to 6 in) wide, truncate at the base, and pinnate with a pinnatifid apex. The sori are 0.8 to 1.3 cm (0.3 to 0.5 in) long and lie alongside the side veins of the pinnae. *Diplazium molokaiense* can be distinguished from other species of *Diplazium* in the Hawaiian Islands by a combination of characters, including venation pattern, the length and arrangement of the sori, frond shape, and the degree of dissection of the frond (Wagner and Wagner 1992).

Reproductive cycles, longevity, specific environmental requirements and limiting factors are for *Diplazium molokaiense* are unknown (Service 1998a).

Historically, *Diplazium molokaiense* was found on Kauai, Makaleha and Schofield Barracks on Oahu, Molokai, Lanai, and Maui. However, within the last 20 years, only one population of one individual has been recorded from Waiopai Gulch, East Maui on DHHL land. This species was last collected on Oahu in 1945 from Kolekole Pass to Kaala (HINHP Database 2001).

Diplazium molokaiense on Oahu was found on steep rocky wooded gulch walls in wet forests from 618 to 1,202 m (2,027 to 3,943 ft) elevation (HINHP Database 2001).

No other information is available for *Diplazium molokaiense* on Oahu.

Eugenia koolauensis (Nioi)

Eugenia koolauensis, a member of the myrtle family (Myrtaceae), is a small tree or shrub between 2 and 7 m (7 and 23 ft) tall with branch tips covered with dense brown hairs. *Eugenia koolauensis* is one of two species in the genus that are native to Hawaii, it differs from the other species in having leaves that are densely hairy on the lower surface and leaf margins that curve under the leaves (Wagner *et al.* 1999).

This species has been observed in flower from February to December in various years. No other information exists on reproductive cycles, longevity, specific environmental requirements, or limiting factors (Service 1998b).

Eugenia koolauensis was historically known from Maunaloa on western Molokai and from Kaipapau Valley, Hanaimoa and Kahawainui Gulches, and a gully southeast of Kahuku on Oahu. Currently, this species is only found on Oahu in ten populations on Federal, State, and private lands Hanaimoa Gulch, Papali Gulch, Kaleleiki Gulch, Aimuu Gulch, Kaunala Gulch, Pahipahialua Gulch, Oio Gulch, and Palikea Gulch. A total of fewer than 70 individuals occur in the Koolau populations (HINHP Database 2001; EDA Database 2001; GDSI 2001).

Eugenia koolauensis is found on gentle to steep slopes or ridges in mesic or dry forests dominated by *Metrosideros polymorpha* or *Diospyros* sp. from 57 to 437 m (187 to 1,433 ft) in elevation. Other associated plant species include *Bobea elaitor, Rauvolfia sandwicensis, Alyxia oliviformis, Pouteria sandwicensis, Dicranopteris linearis, Styphelia tameiameiae, Carex meyenii, Myrsine lessertiana, Nestegis sandwicensis, Pleomele halapepe,* or *Psydrax odorata* (HINHP Database 2001; Service 1998b).

The major threats to *Eugenia koolauensis* on Oahu are habitat degradation by feral pigs; competition with alien plant species such as *Casuarina equisetifolia, Eucalyptus* sp., *Cordyline fruticosa, Passiflora laurifolia* (yellow granadilla), *Oplismenus hirtellus, Acacia confusa, Araucaria columnaris, Toona ciliata, Melia azedarach, Grevillea robusta, Aleurites moluccana, Syzygium cumini, Passiflora suberosa, Panicum maximum, Hyptis pectinata, Ardisia elliptica, Schinus terebinthifolius, Clidemia hirta, Psidium cattleianum,* and *Lantana camara;* and the limited numbers of this species make it vulnerable to extinction due to naturally caused events and reduced reproductive vigor (59 FR 14482; HINHP Database 2001).

Euphorbia haeleeleana (Akoko)

Euphorbia haeleeleana, a member of the spurge family (Euphorbiaceae) and a short-lived perennial, is a dioecious (female and male flowers on separate

plants) tree 3 to 14 m (10 to 46 ft) tall. The alternate leaves are papery in texture, elliptic, and usually 10 to 15 cm (4 to 6 in) long and 4 to 6 cm (2 in) wide. Male trees bear many small male flowers within a cyathium (a compact inflorescence with small individual flowers). The female trees have cyathia with a single female flower surrounded by numerous abortive male flowers. The capsules (dry fruit that open at maturity) are round. This species is distinguished from others in the family 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. This species sets fruit between August and October. Little else is known about the life history of this species. Reproductive cycles, longevity, specific environmental requirements, and limiting factors are unknown (Service 1999; Wagner *et al.* 1999).

Euphorbia haeleeleana is known historically and currently from northwestern Kauai and the Waianae Mountains of Oahu. On Oahu, six populations of approximately 134 individuals are known from Keawaula Gulch, Kahanahaiki Valley, Kaumokunui-Kaumokuiki Ridge, and Alaieihe Gulch on Federal, State, and private lands (HINHP Database 2001; GDSI 2001; EDA Database 2001).

Euphorbia haeleeleana on Oahu is usually found in dry forest that is often dominated by *Diospyros* sp. The plant is typically found at elevations between 156 and 586 m (512 and 1,922 ft). Associated plant species include *Psydrax odorata, Dodonaea viscosa, Erythrina sandwicensis, Pleomele* sp., *Reynoldsia sandwicensis,* or *Sapindus oahuensis* (HINHP Database 2001).

The main threats to *Euphorbia haeleeleana* on Oahu are habitat degradation and/or destruction by wild and feral ungulates including goats and pigs; predation by rats; fire; potential military activities; and competition with the alien plant species, *Panicum maximum, Grevillea robusta, Toona ciliata, Lantana camara, Aleurites moluccana, Syzygium cumini, Melia azedarach, Psidium cattleianum, Passiflora suberosa, Schinus terenbinthifolius, Hyptis pectinata, Melinus minutiflora, Kalanchoe pinnata, Caesalpinia decapetala* (wait-a-bit), *Ficus microcarpa, Digitaria insularis* (sourgrass), *Rivina humilis, Coffea arabica,* and *Leucaena leucocephala* (HINHP Database 2001).

Flueggea neowawraea (Mehamehame)

Flueggea neowawraea, a member of the spurge family (Euphorbiaceae) and a long-lived perennial, is a large tree up to 30 m (100 ft) tall and 2 m (7 ft) in diameter with white oblong pores covering its scaly, pale brown bark. The thin, papery, oval leaves, 4 to 14 cm (1.5 to 5.5 in) long and 2 to 9 cm (0.8 to 3.5 in) wide, are green on the upper surface and pale green on the lower surface. This species is usually dioecious (having separate male and female plants) with unisexual flowers lacking petals. Male flowers, on stalks less than 4 mm (0.2 in) long, have five green sepals with brownish tips. The female flowers, on stalks 1 to 2.5 mm (0.04 to 0.1 in) long, have sepals of unequal length with irregular margins. This 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 (Hayden 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. Little else is known about the life history of this species. Reproductive cycles, longevity, specific environmental requirements, and limiting factors are unknown (Service 1999; Hayden 1999).

Historically, *Flueggea neowawraea* was known from Molokai, Oahu, Kauai and the island of Hawaii. Currently, *Flueggea neowawraea* is known from Kauai, Oahu, east Maui, and Hawaii. On Oahu, *Flueggea neowawraea* is known from 19 locations with approximately 31 individuals on Federal, State, city, county, and private lands Makua Valley, Makaha, Alaiheihe Gulch, Kaluaa Gulch, Makaleha Valley, Ekahanui Gulch, Pahole Gulch, Keaau Valley, Kahanahaiki Valley, Kaawa Gulch, Waianae Kai, Palikea Gulch, Manuwai Gulch, Mohiakea Gulch, Kauhiuhi, Mikilua, and Lualualei (HINHP Database 2001; GDSI 2001; EDA Database 2001).

Flueggea neowawraea occurs on gulch slopes, ridge crests, or near streams in dry or mesic forest at elevations of 323 to 1,006 m (1,059 to 3,300 ft). Associated plant species include *Pisonia sandwicensis, Hibiscus arnottianus, Morinda sandwicensis* (noni), *Hedyotis terminalis, Alyxia oliviformis, Chamaesyce multiformis, Metrosideros polymorpha, Myrsine* sp., *Pleomele* sp., *Myoporum sandwicense, Pteralyxia* sp., *Pipturis albidus, Diospyros hillebrandii, Pisonia umbellifera, Charpentiera* sp., *Claoxylon sandwicensis, Antidesma platyphyllum, Sapindus oahuensis, Pittosporum* sp., *Erythrina sandwicensis, Diospyros sandwicense, Antidesma pulvinatum, Bobea* sp., *Psydrax odorata, Nestegis sandwicensis, Rauvolfia sandwicensis, Streblus pendulina,* and *Chamaesyce herbstii* (akoko) (HINHP Database 2001; Hayden 1999).

The primary threat to the continued existence of *Flueggea neowawraea* on Oahu is the black twig borer that has affected all known *Flueggea neowawraea* plants. Other major threats include habitat degradation by feral and wild ungulates, pigs and goats; competition with the alien plant species *Aleurites moluccana, Schinus terebinthifolius, Psidium* spp., *Grevillea robusta, Paspalum conjugatum, Passiflora suberosa, Toona ciliata, Clidemia hirta, Lantana camara, Ficus macrophylla, Blechnum occidentale, Kalanchoe pinnata, Syzygium cumini, Ageratina riparia, Rivina* sp., *Melinis minutiflora,* and *Ficus microcarpa;* fire; Chinese rose beetle; the small population size with its limited gene pool and depressed reproductive vigor, compounded by a requirement for cross-pollination because the species is dioecious; military activities are possible threats at the Lualualei Naval Reservation and the Army's Schofield Barracks; and predation of the fruit by rats (Service 1999; HINHP Database 2001).

Gouania meyenii (NCN)

Gouania meyenii, a member of the buckthorn family (Rhamnaceae) and a short-lived perennial, is an erect to spreading shrub. The main character that tells this species apart from other members of its genus are its two to three winged fruits, peduncle length, and the hairiness of the fruits (Wagner *et al.* 1999).

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

Historically, *Gouania meyenii* was known from central and southern areas of the Waianae Mountains, from Kamaileunu Ridge to Honouliuli. This species was also recorded from Diamond Head in 1831. Currently, this species is found on Oahu and Kauai. On Oahu, this species is found on Makaha-Waianae Kai Ridge on State, private, city, and county lands. The three known populations on Oahu contain an

estimated 63 individuals (HINHP Database 2001; Wagner *et al.* 1999; GDSI 2001).

Gouania meyenii typically grows on moderate to steep slopes in dry shrubland or mesic lowland forest at elevations of 17 to 930 m (56 to 3,050 ft). Associated plant species include *Diospyros sandwicensis, Charpentiera* sp., *Alyxia oliviformis, Pisonia* sp., *Hibiscus* sp., *Canavalia* sp., *Sophora chrysophylla, Sida fallax, Schiedea* sp., *Dubautia sherffiana, Psydrax odorata, Eragrostis* sp., *Dryopteris unidentata, Sapindus oahuensis, Myrsine* sp. (kolea) *Dodonaea viscosa, Chamaesyce* sp., *Psychotria* sp., *Hedyotis* sp., *Melicope* sp., *Nestegis sandwicensis, Bidens* sp., *Carex meyenii, Diospyros* sp., *Lysimachia* sp., or *Senna gaudichaudii* (HINHP Database 2001).

The major threats to *Gouania meyenii* on Oahu are competition from the alien plant species *Pimenta dioica, Psidium guajava, Lantana camara, Melinis minutiflora, Grevillea robusta, Leucaena leucocephala, Kalanchoe pinnata, Oplismenus hirtellus, Psidium cattleianum,* and *Schinus terebinthifolius;* fire; habitat degradation by feral pigs and goats; and the small number of extant populations and a risk of extinction from naturally occurring events and/or reduced reproductive vigor due to the small number of remaining individuals (HINHP Database 2001).

Gouania vitifolia (NCN)

Gouania vitifolia, a member of the buckthorn family (Rhamnaceae), is a climbing shrub or woody vine with tendrils. The species is the only Hawaiian member of the genus with tendrils and toothed leaf margins (Wagner *et al.* 1999).

Gouania vitifolia flowers from March to May. Seed capsules develop in about 6 to 8 weeks. Plants appear to live about 10 to18 years in the wild. No other information exists on specific environmental requirements or limiting factors. (Service 1998b).

Historically, *Gouania vitifolia* was known from West Maui; the Kau District of the island of Hawaii; and the northwestern portion of the Waianae Mountains in Makaleha, Keaau, and Waianae Kai Valleys on Oahu. Currently, this species is extant on Oahu and the island of Hawaii. On Oahu, it is known from two populations on State and private lands, located at Waianae Kai and Keaau Valley, totaling 44 individuals (HINHP Database 2001; GDSI 2001; Wagner *et al.* 1999).

Gouania vitifolia typically grows on the sides of ridges and gulches in dry to mesic forests at elevations of 39 to 978 m (128 to 3,208 ft). Associated plant species include *Erythrina sandwicensis, Dodonea viscosa, Hibiscus arnottianus, Pipturis albidus, Urera glabra, Chamaesyce* sp., *Psychotria* sp., *Hedyotis* sp., *Melicope* sp., *Nestegia sandwicensis, Bidens* sp., *Carex meyenii,* or *Diospyros sandwicensis* (Service 1998b).

The major threats to *Gouania vitifolia* are competition from alien plant species particularly *Panicum* sp. (panic grass), *Leucaena leucocephala, Toona ciliata, Passiflora suberosa, Aleurites moluccana, Melinis minutiflora, Hyptis pectinata, Cordyline fruticosa, Passilfora edulis, Passiflora ligularis, Oplismenus hirtellus, Lantana camara, Rubus argutus, Buddleia asiatica, Psidium cattleianum* and *Schinus terebinthifolius;* habitat destruction by feral pigs; and a threat of random extinction and reduced reproductive vigor due to the small number of extant individuals (HINHP Database 2001; 59 FR 32932).

Hedyotis coriacea (Kioele)

Hedyotis coriacea, a member of the coffee family (Rubiaceae), is a small shrub with leathery leaves which are generally elliptic to oblong in shape, 3 to 8 cm (1.2 to 3.1 in) long and usually 1.5 to 3 cm (0.6 to 1.2 in) wide. This species is distinguished from others of the genus by its small, triangular calyx lobes, which do not enlarge in fruit, and the combination of capsules which are longer than wide and flower buds which are square in cross section (Wagner *et al.* 1999).

Little is known about the life history of *Hedyotis coriacea.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1997).

Historically, *Hedyotis coriacea* was known from the Waianae and Koolau Mountains on Oahu and the Army's Pohakuloa Training Area on the island of Hawaii. Currently, this species is extant on Maui and Hawaii. This species was last collected on Oahu in the 1800s (HINHP Database 2001).

Hedyotis coriacea is found on steep, rocky, slopes in dry to mesic *Dodonaea viscosa* dominated shrublands or forests at elevations of 57 to 836 m (187 to 2,742 ft). Associated species include *Metrosideros polymorpha, Styphelia tameiameiae,* or *Alyxia oliviformis* (HINHP Database 2001; 57 FR 20772).

The major threats to *Hedyotis coriacea* are the small number of remaining individuals; fire; and alien weeds (Service 1997; 57 FR 20772).

Hesperomania arborescens (NCN)

Hesperomannia arborescens, a member of the aster family (Asteraceae), is a small shrubby tree that usually stands 1.5 to 5 m (5 to 16 ft) tall. This member of an endemic Hawaiian genus differs from other *Hesperomannia* species in having the following combination of characters erect to ascending flower heads, thick flower head stalks, and usually hairless and relatively narrow leaves (Wagner *et al.* 1999).

This species was observed in flower from April through June and fruit during March and June. No other information is available on reproductive cycles, longevity, specific environmental requirements, and limiting factors (Service 1998b).

Hesperomannia arborescens was formerly known from Molokai, Lanai, and scattered populations throughout the Koolau Mountains, Oahu, from Koolauloa and Pupukea at its northern extreme to Konahuanui at the southern end. This species is now known from Oahu, Molokai, and Maui. On Oahu, there are 23 populations containing between 86 and 93 individuals on private, city, county, State, and Federal lands at a few disjunct locations upslope of Kahuku, Laie, and Malaekahana; along Poamoho Trail above Poamoho Stream; along Waikane-Schofield Trail near the ridge summit; at Kipapa Gulch; on Halawa Ridge; Waimanalo-Niu divide, Kainawaanui, Kaukonahua Gulch, Maakua-Kaipapau Ridge, Kapakahi Gulch, Halemano-Opaeula Ridge, Kawailoa Trail, Kaimananui Gulch, and upper Palolo Valley to Niu Valley (HINHP Database 2001; GDSI 2001; EDA Database 2001; Service 1998b).

Hesperomannia arborescens on Oahu, is often found on slopes or ridges in association with *Scaevola glabra* (ohe naupaka), *Broussaisia arguta, Melicope* sp., *Acacia koa, Machaerina angustifolia, Hedyotis terminalis, Tetraplasandra oahuensis, Scaevola gaudichaudiana* (naupaka kahakai), *Dubautia* sp., *Labordia sessilis* (kamakahala), *Cibotium* sp., *Perotettia sandwicensis, Pipturus* sp., *Wikstroemia* sp., *Cheirodendron* sp., *Coprosma* sp., *Myrsine* sp., *Bobea elatior, Hibiscus arnottianus, Metrosideros polymorpha, Nestegis sandwicensis, Dicranopteris linearis, Antidesma platyphyllum, Psychotria mariniana, Syzygium sandwicensis,* and common *Melicope* spp. It typically grows on steep slopes, ridge tops, and gulches in lowland wet forests and occasionally in shrublands between 110 and 1,147 m (361 and 3,762 ft) in elevation (HINHP Database

2001; Wagner *et al.* 1999; Service 1998b).

The major threats to *Hesperomannia arborescens* are habitat degradation by feral pigs and goats; competition with the alien plant species *Clidemia hirta, Psidium cattleianum, Leptospermum scoparium,* and *Axonopus fissifolius;* fire; impact by humans; and extinction due to random environmental events or reduced reproductive vigor due to this species' limited numbers (59 FR 14482; HINHP Database 2001)

Hesperomannia arbuscula (NCN)

Hesperomannia arbuscula, a member of the aster family (Asteraceae), is a small shrubby tree, 2 to 3.3 m (7 to 11 ft) tall. This species can be distinguished from other members of the genus by the erect flower heads and the leaves, usually hairy beneath, which are one to two times as long as wide (Wagner *et al.* 1999).

Hesperomannia arbuscula usually flowers in the spring depending on precipitation. Seeds mature in about 6 weeks and trees last about 10 to 15 years. No further information is available on reproductive cycles, specific environmental requirements, or limiting factors (Service 1998b).

Historically, *Hesperomannia arbuscula* was known from the central and southern Waianae Mountains, from Makaleha to Puu Kanehoa on Oahu, and from West Maui. This species is currently known to be extant on the Makaha-Waianae Kai Ridge and in Kaluaa and Kapuna Gulches on Oahu and on West Maui. The six known populations on Oahu contain between 90 and 92 individuals on State, private, city, and county lands (HINHP Database 2001; GDSI 2001).

Hesperomannia arbuscula on Oahu typically grows on slopes and ridges in dry to wet forest dominated by *Acacia koa* and *Metrosideros polymorpha* at elevations of 370 and 1,053 m (1,214 and 3,454 ft). Associated species include *Syzygium sandwicensis, Freycinetia arborea, Antidesma* sp., *Bobea elatior, Hibiscus* sp., *Diospyros hillebrandii, Hedyotis terminalis, Bidens* sp., *Alyxia oliviformis,* and *Psychotria* sp., or the endangered *Cyanea longifleua* (HINHP Database 2001; Service 1998b; Wagner *et al.* 1999).

The major threats to *Hesperomannia arbuscula* on Oahu are habitat degradation by feral pigs; competition from the alien plant species *Lantana camara, Psidium cattleianum, Rubus argutus, Clidemia hirta,* and *Schinus terebinthifolius;* trampling by humans; and the small number of populations and a risk of extinction from naturally occurring events and/or reduced reproductive vigor due to the small number of remaining individuals (56 FR 55770; HINHP Database 2001).

Hibiscus brackenridgei (Mao hau hele)

Hibiscus brackenridgei, a member of the mallow family (Malvaceae), is a sprawling to erect shrub or small tree. This species differs from other members of the genus in having the following combination of characteristics yellow petals, a calyx consisting of triangular lobes with raised veins and a single midrib, bracts attached below the calyx, and thin stipules that fall off, leaving an elliptic scar. Three subspecies of *Hibiscus brackenridgei* are now recognized, *brackenridgei, molokaiana,* and *mokuleianus.* Subspecies *molokaiana* and *mokuleianus* are found on the island of Oahu. When we listed this species in 1994 only two subspecies, *brackenridgei* and *mokuleianus,* were recognized. Subsequent to the final rule listing this species in 1994, we became aware of Wilson's (1993) taxonomic treatment of this group in which *Hibicsus brackenridgei* ssp. *molokaiana* was changed to subspecies status and recognized as distinct from *Hibicsus brackenridgei* ssp. *brackenridgei.* Wilson's (1993) treatment is cited in the supplement in the revised edition of the Manual of the Flowering Plants of Hawaii as the basis for recognizing *Hibicsus brackenridgei* ssp. *molokaiana.* We will address this name change in a future **Federal Register** notice (HINHP Database 2000; Bates 1999; Wilson 1993; Wagner *et al.* 1999).

Hibiscus brackenridgei is known to flower continuously from early February through late May, and intermittently at other times of year. Intermittent flowering may possibly be tied to day length. Little else is known about the life history of this plant. Pollination biology, longevity, specific environmental requirements, and limiting factors are unknown (Service 1999).

Hibiscus brackenridgei ssp. *mokuleianus* is currently known from Oahu, Lanai, Maui, and Hawaii; it may possibly occur on Kauai. On Oahu there are a total of fewer than 206 individual plants in five populations—Kaumokunui Gulch, Kawaiu Gulch, Palikea Gulch, Kihakapu Gulch, and Kaimuhole Gulch on State and private lands. *Hibiscus brackenridgei* ssp. *molokaiana* is currently known from Oahu. On Oahu, there are a total of 5 individual plants in one population in Makua Valley on land under federal jurisdiction (Joel Lau, TNCH, pers. comm., 2001; HINHP Database 2001; GDSI 2001).

Hibiscus brackenridgei ssp. *mokuleianus* on Oahu occurs on slopes, cliffs, and arid ledges in lowland dry forest and shrubland from 24 to 490 m (79 to 1,607 ft) in elevation. Associated plant species include *Erythrina sandwicensis, Heteropogon contortus, Waltheria indica, Doryopteris* sp., *Lepidium bidentatum, Lipochaeta remyi, Bidens amplectans* (kookoolau), *Chamaesyce* sp., *Reynoldsia sandwicensis, Pleomele halapepe, Diospyros hillebrandii, Dodonaea viscosa., Psydrax odorata,* or *Sida fallax. Hibiscus brackenridgei* ssp. *molokaiana* occurs in dry shrublands between 23 and 580 m (75 to 1,902 ft) elevation. Associated plant species include *Waltheria indica, Sida fallax, Doryopteris* sp., *Dodonea viscosa,* and *Heteropogon contortus* (HINHP Database 2001; GDSI Database 2001; EDA, *in litt.* 2001).

The primary threats to *Hibiscus brackenridgei* ssp. *mokuleianus* on Oahu are habitat degradation and possible predation by pigs, goats, cattle, and rats; competition with the alien plant species *Panicum maximum, Syzygium cumini, Melia azedarach, Aleurites moluccana, Hyptis pectinata, Leucaena leucocephala, Schinus terebinthifolius, Toona ciliata, Caesalpinia decapetala, Ageratum conyzoides, Glycine wightii* (NCN), *Grevillea robusta, Passiflora suberosa, Coffea arabica, Spathodea campanulata* (African tulip tree), and *Passiflora edulis;* road construction; fire; and susceptibility extinction caused by random environmental events or reduced reproductive vigor due to small population size and a limited number of populations. The primary threats to *Hibiscus brackenridgei* ssp. *molokaiana* on Oahu are habitat degradation and possible predation by pigs and goats; competition with the alien plant species *Panicum maximum, Leucaena leucocephala,* and *Ageratum conyzoides;* fire; Chinese rose beetle; and susceptibility extinction caused by random environmental events or reduced reproductive vigor due to small population size and a limited number of populations (HINHP Database 2001; 59 FR 56333).

Isodendrion laurifolium (Aupaka)

Isodendrion laurifolium, a member of the violet family (Violaceae), is a slender, straight shrub with few branches. The species is distinguished from others in the genus by its leathery, oblong-elliptic, 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 (Service 1999).

Historically, *Isodendrion laurifolium* was known from scattered locations on Kauai and the Waianae and Koolau mountains of Oahu. Currently, this species is found on Kauai and Oahu. On Oahu, there are a total of between 22 and 23 individuals found in five locations on State, private, city, and county lands Makaha in the Waianae Mountains, East Makaleha Valley, Waianae Kai, Kaawa Gulch, and Kaumokunui Gulch, (Schofield Barracks Military Reservation) (HINHP Database 2001; GDSI 2001).

Isodendrion laurifolium on Oahu is usually found between 90 and 959 m (295 and 3,146 ft) elevation on gulch slopes, in ravines, and on ridges in diverse mesic or dry forest dominated by *Metrosideros polymorpha, Acacia koa, Eugenia reinwardtiana,* or *Diospyros sandwicensis* with one or more of the following associated native plant species *Nestegis sandwicensis, Hibiscus arnottianus, Alyxia oliviformis, Rauvolfia sandwicensis, Psydrax odorata, Carex wahuensis, Charpentiera tomentosa* (papala), *Doodia* sp., *Dryopteris unidentata, Sapindus* sp. (soapberry), *Antidesma pulvinatum, Smilax melastomifolia* (hoi kuahiwi), *Antidesma platyphyllum, Xylosma hawaiiense, Hedyotis terminalis, Pisonia* sp., or *Pouteria sandwicensis* (HINHP Database 2001; Service 1999).

The primary threats to *Isodendrion laurifolium* on Oahu are habitat degradation by feral goats and pigs; competition with the alien plant species *Schinus terebinthifolius, Aleurites moluccana, Cordyline fruticosa, Psidium cattleianum, Toona ciliata,* and *Grevillea robusta;* and a potential threat from military activities (HINHP Database 2001; 61 FR 53108).

Isodendrion longifolium (Aupaka)

Isodendrion longifolium, a member of the violet family (Violaceae), is a slender, straight shrub. The 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 plant. Reproductive cycles, longevity, specific environmental requirements, and limiting factors are unknown (Service 1999).

Historically, *Isodendrion longifolium* was known from scattered locations on Kauai and the Waianae Mountains on Oahu. Currently, *Isodendrion longifolium* is known from populations on Kauai and Oahu. On Oahu, there are a total of 30 individual plants in four locations on Federal, State, and private lands Palikea Gulch, Kaawa Gulch, Makaua Gulch, and Kaukonahua Stream, (HINHP Database 2001; EDA Database 2001).

Isodendrion longifolium on Oahu is found on steep slopes and stream banks in mixed mesic or lowland wet *Metrosideros polymorpha-Dicranopteris linearis* forest, usually between 363 and 964 m (1,191 and 3,162 ft) elevation. Associated plant species include *Syzygium sandwicensis, Pouteria sandwicensis, Acacia koa, Psydrax odorata, Alyxia oliviformis, Melicope* sp., *Pittosporum* sp., *Carex* sp., *Selaginella arbuscula, Isachne pallens* (NCN), *Bobea brevipes* (ahakea lau lii), *Antidesma* sp., *Cyanea* sp. (haha), *Cyrtandra* sp., *Hedyotis terminalis, Peperomia* sp., *Perrottetia sandwicensis,* or *Psychotria* sp. (HINHP Database 2001; Service 1999).

The major threats to *Isodendrion longifolium* on Oahu are habitat degradation or destruction by feral goats and pigs; and competition with the alien plants, *Clidemia hirta, Psidium cattleianum, Thelypteris parasitica, Paspalum conjugatum, Oplismenus hirtellus, Ageratina riparia,* and *Blechnum occidentale.* The Palikea Gulch population is potentially threatened by fire (HINHP Database 2001; 61 FR 53108).

*Isodendrion pyrifolium (*wahine noho kula*)*

Isodendrion pyrifolium, a member of the violet family (Violaceae), is a small, branched shrub. The species is distinguished from other taxa in the genus by its smaller, green-yellow flowers, and hairy stipules and leaf veins (Wagner *et al.* 1999).

During periods of drought, this species will drop all but the newest leaves. After sufficient rains, the plants produce flowers with seeds ripening 1 to 2 months later. No further information is available on reproductive cycles, specific environmental requirements, or limiting factors (Service 1996c).

Isodendrion pyrifolium was known historically from Oahu's central Waianae mountains, Maui, Hawaii, Niihau, Molokai, and Lanai. Currently, this species is found on Hawaii. This species was last collected on Oahu in the late 1800s (HINHP Database 2001).

Isodendrion pyrifolium on Oahu was found on bare rocky hills and in wooded ravines in dry shrublands at low elevations from 363 to 964 m (1,191 to 3,162 ft.) (Wagner *et al.* 1999; HINHP Database 2001).

No threat information is available for *Isodendrion pyrifolium* on Oahu.

*Lobelia niihauensis (*NCN*)*

Lobelia niihauensis, a member of the bellflower family (Campanulaceae), is a small, branched shrub. This species is distinguished from others in the genus by its leaves lacking or nearly lacking leaf stalks, the magenta-colored flowers, the width of the leaf, and length of the flowers (56 FR 55770).

Lobelia niihauensis flowers in late summer and early fall. Fruits mature a month to 6 weeks later. Plants are long-lived and are known to live as long as 20 years (Service 1998b).

Historically, *Lobelia niihauensis* was known from the Waianae Mountains of Oahu (Uluhulu Gulch to Nanakuli Valley), from Kauai, and Niihau. It is now known to be extant only on Kauai and Oahu. On Oahu, this species remains on Ohikilolo Ridge, Kaimokuiki-Manuwai Ridge, Kamaileunu Ridge, Mt. Kaala, Makaha-Waianae Kai, Makua Military Reservation, Nanakuli, South Mohiakea Gulch, East of Puu Kalena, Kahanahaiki Valley, between Puu Hapapa and Puu Kanehoa, Puu Kailio, between Kolekole Pass and Puu Hapapa, North of Palikea, Puu Kaua-Kauhiuhi-Pahoa-Halona subdistricts, and Lualualei Naval Magazine in 21 populations containing between 362 and 397 individual plants on Federal, State, city, and county lands (HINHP Database 2001; GDSI 2001; EDA Database 2001).

Lobelia niihauensis on Oahu typically grows on exposed mesic or dry cliffs and ledges, at elevations from 339 to 926 m (1,112 to 3,037 ft). Associated plant species include *Osteomeles anthyllidifolia, Dodonaea viscosa, Schiedea mannii, Carex meyenii, Doryopteris* sp., *Sida fallax,* Styphelia tameiameiae, *Eragrostis* sp., *Bidens* sp., *Plectranthus parviflorus, Lipochaeta tenuis,* or *Artemisia* sp. (HINHP Database 2001; 56 FR 55770).

On Oahu, the major threats to *Lobelia niihauensis* are habitat degradation and predation by feral goats, rats, and slugs; fire; military activities; and competition from the alien plant species *Schinus terebinthifolius, Leucaena leucocephala, Acacia confusa, Grevillea robusta, Lantana camara, Melinis minutiflora, Melinis repens, Ageratina riparia, Erigeron karvinskianus, Kalanchoe pinnata,* and *Ficus microcarpa* (HINHP Database 2001; 56 FR 55770).

*Lysimachia filifolia (*NCN*)*

Lysimachia filifolia, a member of the primrose family (Primulaceae), is a small shrub 15 to 50 cm (0.5 to 1.6 ft) tall. The linear leaves measure 15 to 54 mm (0.6 to 2.1 in) long and 0.3 to 1.8 mm (0.01 to 0.07 in) wide and are

usually alternately arranged. They are single veined and sparsely hairy or hairless. The bell shaped flowers are reddish purple, 6 to 10 mm (0.2 to 0.4 in) long, and borne singly on flower stalks about 18 to 30 mm (0.7 to 1.2 in) long which elongate upon fruiting. Fruits are thick, hard capsules about 5 mm (0.2 in) long which contain numerous minute, nearly black, irregularly shaped seeds. This species is distinguished from other taxa of the genus by its leaf shape and width, calyx lobe shape, and corolla length (Service 1995b).

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 (Service 1995b).

Historically, *Lysimachia filifolia* was known only from Kauai. This species is now known from Oahu and Kauai. On Oahu, there is one population containing a total of 50 individuals, on the slopes of Waiahole Valley in the Koolau Mountains on State land (HINHP Database 2001; GDSI 2001).

On Oahu, *Lysimachia filifolia* 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 65 to 798 m (213 to 2,617 ft). Associated plants include mosses, ferns, liverworts, and *Pilea peploides* (NCN) (Service 1995b; HINHP Database 2001; Wagner *et al.* 1999).

The major threat to *Lysimachia filifolia* on Oahu is competition with the alien plant species *Ageratina riparia, Schefflera actinophylla, Cordyline fruticosa, Pluchea* sp. (sourbush), and *Blechnum occidentale.* Additionally, individuals of the species are vulnerable to rock slides. Because only one population of *Lysimachia filifolia* occurs on each of only two islands, the species is threatened by extinction due to naturally caused events (HINHP Database 2001; 59 FR 09304).

*Mariscus pennatiformis (*NCN*)*

Mariscus pennatiformis, a member of the sedge family (Cyperaceae), is a perennial plant with a woody root system covered with brown scales. The stout, smooth, three-angled stems are between 0.4 and 1.2 m (1.3 and 4 ft) long, slightly concave, and 3 to 7 mm (0.1 to 0.3 in) in diameter in the lower part. The three to five linear, somewhat leathery leaves are 8 to 17 mm (0.3 to 0.7 in) wide and at least as long as the stem. Each flower cluster, umbrella-shaped and moderately dense, is 4 to 15 cm (1.5 to 6 in) long and five to 25 cm (2 to 10 in) wide. About five to 18 spikes, comprised of numerous spikelets, form each cluster. Each spikelet, measuring about 8 to 14 mm (0.3 to 0.6 in) in length, is yellowish brown or grayish brown and is comprised of eight to 25 densely arranged flowers. The glumes (bracts beneath each flower), which are less than twice as long as wide, are spreading and overlap tightly. The lowest glume does not overlap the base of the uppermost glume. This species differs from other members of the genus by its three-sided, slightly concave, smooth stems; the length and number of spikelets; the leaf width; and the length and diameter of stems. The two subspecies are distinguished primarily by larger and more numerous spikelets, larger achenes (dry, one-seeded fruits), and more overlapping and yellower glumes in ssp. *pennatiformis* as compared with ssp. *bryanii.* Subsequent to the final rule listing this species in 1994, we became aware of Tucker's (1994) treatment of this genus in which the genus *Mariscus* was changed to *Cyperus.* Tucker's (1994) treatment is cited in the supplement in the revised edition of the Manual of the Flowering Plants of Hawaii as the basis for recognizing *Mariscus* as *Cyperus.* We will address this name change in a future **Federal Register** notice (Service 1999; Wagner *et al.* 1999).

Reproductive cycles, longevity, specific environmental requirements, and limiting factors are unknown for *Mariscus pennatiformis* ssp. *pennatiformis* (Service 1999).

Historically, *Mariscus pennatiformis* was known from Kauai, Oahu (Waianae Mountains on a ridge above Makaha Valley), East Maui, the island of Hawaii, and from Laysan (ssp. *bryani*) in the Northwestern Islands. Only one population has been seen in the last 70 years on the main islands, when an unknown number of plants were seen sometime in Keanae Valley on Maui in the 1970s (HINHP Database 2001).

Mariscus pennatiformis typically grows in mesic and wet *Metrosideros polymorpha* forest and *Metrosideros polymorpha-Acacia koa* forest at elevations between 424 and 1,032 m (1,391 and 3,385 ft). The associated native plant species on Oahu are unknown (J. Lau, *in litt.* 2001).

No threat information is available for *Mariscus pennatiformis* on Oahu.

*Marsilea villosa (*Ihiihi*)*

Marsilea villosa, a member of the marsilea family (Marsileaceae) is an aquatic to semiaquatic fern similar in appearance to a four-leaved clover that requires periodic flooding to complete its life cycle. The species is the only member of the genus native to Hawaii and is closely related to *Marsilea vestita* of the western coast of the United States (Service 1996a).

Sexual reproduction of *Marsilea villosa* is initiated through the production of a hard sporocarp borne on the rhizome of a leaf pair node. The young sporocarp is covered with rust-colored hairs which are lost as the sporocarp matures. The sporocarp will mature only if the soil dries below threshold levels for leaf growth. The sporocarp remains in the soil for an extended period of time and must be scarified before it will open. It is not known how the sporocarp (a structure in or on which spores are produced) is scarified in *Marsilea villosa* but bacterial action is thought to erode the wall of the sporocarp to the point that water can be absorbed and force the sporocarp to open, as in other *Marsilea* species (Service 1996a).

Marsilea villosa was historically known from Oahu, Molokai, and Niihau. Currently, it is found on Oahu and Molokai. There are four populations with an unknown total number of individuals on the island of Oahu Koko Head Crater, on the Lualualei Naval Reservation, Kealakipapa, and Ihiihilauakea, on Federal, city, county, and private lands (HINHP Database 2001; GDSI 2001; Service 1996a).

Marsilea villosa typically grows in cinder craters, vernal pools surrounded by lowland dry forest vegetation, mud flats, or lowland grasslands at elevations 424 and 1,032 m (1,391 and 3,385 ft ft). Associated native plant species include Sida fallax (HINHP Database 2001).

The main reason for the decline of *Marsilea villosa* on Oahu is habitat destruction and the destruction of natural hydrology; many of the areas from which it is known to have occurred are now sugar cane fields, industrial parks, housing developments, and pastures. The greatest immediate threats to the survival of this species are the encroachment and competition from naturalized, exotic plants, such as *Prosopis pallida* (kiawe), *Panicum maximum, Bidens pilosa* and *Cynodon dactylon* (Bermuda grass); and the disturbance of areas where the plant grows by off-road vehicles or by grazing cattle; continued development and habitat degradation; fire; small population size; and fragmentation, trampling and other impacts from humans and introduced mammals (57 FR 27863; HINHP Database 2001).

*Melicope pallida (*Alani*)*

Melicope pallida, a member of the citrus family (Rutaceae), is a tree with

grayish white hairs and black, resinous new growth. The species differs from *Melicope haupuensis, Melicope knudsenii,* and other members of the genus by presence of resinous new growth, leaves folded and in clusters of three, and fruits with separate carpels (Wagner *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 (Service 1995b).

Melicope pallida is currently and historically known from Kauai and Oahu on State and private lands from the Waianae Mountains, the base of Mount Kaala and near Palikea, within TNCH's privately owned Honouliuli Preserve. On Oahu, it is currently known from the base of Mount Kaala near Palikea in the Waianae Mountains. There is a single population with a single individual (HINHP Database 2001; GDSI 2001).

Melicope pallida usually grows on steep rock faces in lowland dry or mesic forests at elevations of 234 to 841 m (768 to 2,758 ft). Associated plant species include *Psychotria mariniana, Bobea elatior, Acacia koa, Cibotium* sp., *Wikstroemia oahuensis, Syzygium sandwicensis, Alyxia oliviformis, Dryopteris* sp. (NCN), *Metrosideros polymorpha, Pipturus albidus, Sapindus oahuensis, Tetraplasandra* sp. (ohiohe), *Xylosma hawaiiense* or the endangered *Abutilon sandwicense* (HINHP Database 2001; 59 FR 09304).

The major threat to *Melicope pallida* on Oahu is competition from introduced plants, especially *Andropogon virginicus, Psidium cattleianum, Pterolepis glomerata, Clidemia hirta,* and *Toona ciliata.* A potential threat to *Melicope pallida* is the black twig borer, which is known to occur in areas where this species grows and to feed on members of the genus *Melicope.* Additional threats to *Melicope pallida* are fire; habitat degradation by feral pigs; and extinction due to naturally caused events and/or reduced reproductive vigor due to the small number of existing individuals (HINHP Database 2001; 59 FR 09304).

Nototrichium humile (Kului)

Nototrichium humile, a member of the amaranth family (Amaranthaceae), is an upright to trailing shrub with branched stems to 1.5 m (5 ft) long. Stems and young leaves are covered with short hairs. Leaves are oppositely arranged, oval to oblong in outline, 3 to 9 cm (1.2 to 3.5 in) long, and 2 to 5 cm (0.8 to 2.0 in) wide. Stalkless flowers are arranged in a spike at the ends of the stem. Membranous bracts grow below each flower. Two of the bracts and the sepals fall off with the mature fruit. This species is distinguished from the only other species in the genus by its inflorescence, a slender spike 4 mm (0.2 in) in diameter or less, which is covered with short hairs (Wagner *et al.* 1999).

Nototrichium humile is found on and at the base of rock cliffs and talus slopes in areas that do not receive full sun all day. Plants have been observed flowering after heavy rain, but flowering is generally heaviest in the spring and summer. Fruits mature a few weeks after flowering. In cultivation, this species is known to live for more than a decade (Service 1998b).

Historically and currently, *Nototrichium humile* is known from Oahu and Maui. Currently, on Oahu, it is found in Kapuhi Gulch, Pahole Gulch, Kealia, Kahanahaiki, Kaluakauila Gulch, along Makua-Keaau Ridge to Makaha-Waianae Kai Ridge, and Nanakuli, where it occurs on Federal, State, city, county, and private lands. There are a total of 21 populations containing between 775 and 995 individuals on the island of Oahu (HINHP Database 2001; EDA Database 2001; GDSI 2001).

Nototrichium humile typically grows at elevations of 185 to 806 m (607 to 2,644 ft) on cliff faces, gulches, streambanks, or steep slopes in dry or mesic forests often dominated by *Sapindus oahuensis* or *Diospyros sandwicensis.* Associated species include *Erythrina sandwicensis, Sicyos* sp., *Rauvolfia sandwicensis, Nestegis sandwicensis, Streblus pendulinus, Myoporum sandwicense, Metrosideros polymorpha, Antidesma pulvinatum, Pouteria sandwicensis, Charpentiera* sp., *Hibiscus* sp., *Alyxia oliviformis, Pisonia umbellifera, Lipochaeta tenuis, Stenogyne* sp., *Artemisia australis, Bidens cervicata* (kookoolau), *Carex wahuensis, Elaeocarpus bifidus, Peperomia* sp., *Dodoanea viscosa, Canavalia* sp., *Psydrax odorata, Syzygium sandwicensis, Reynoldsia sandwicensis, Pleomele* sp., *Eugenia reinwartiana, Myrsine lanaiensis,* or the endangered species *Abutilon sandwicense* (Service 1998b; HINHP Database 2001; 56 FR 55770).

On Oahu, the major threats to *Nototrichium humile* are habitat degradation by feral goats and pigs; military activities; competition from the alien plant species *Grevillea robusta, Panicum maximum, Lantana camara, Hyptis pectinata, Rivina humilis, Aleurites moluccana, Toona ciliata, Coffea arabica, Passiflora suberosa, Melia azedarach, Syzygium cumini, Blechnum occidentale, Oplismenus hirtellus, Schefflera actinophylla, Spathodea campanulata, Psidium guajava, Triumfetta semitriloba* (Sacramento bur), *Buddleia asiatica, Ageratina adenophora, Ficus microphylla, Kalanchoe pinnata, Adiantum hispidulum, Caesalpinia decapetala, Cordyline fruticosa, Pimenta dioica, Montanoa hibiscifolia, Schinus terebinthifolius, Leucaena leucocephala, Melinis minutiflora,* and *Psidium cattleianum;* road building and maintenance; and fire (Service 1998b; HINHP Database 2001; 56 FR 55770).

Peucedanum sandwicense (Makou)

Peucedanum sandwicense, a short lived perennial and a member of the parsley family (Apiaceae), is a parsley-scented, sprawling herb. Hollow stems arise from a short, vertical, perennial stem with several fleshy roots. This species is the only member of the genus in the Hawaiian Islands (Constance and Affolter 1999).

Information on the life history of this plant, reproductive cycles, longevity, specific environmental requirements, and limiting factors are generally unknown (Service 1995b).

Historically and currently, *Peucedanum sandwicense* is known from Molokai, Maui, and Kauai. Discoveries in 1990 extended the known distribution of this species to the island of Oahu. O n Oahu, there are a total of four populations containing 51 individual plants on State, city, and county lands Keaau Valley, Puu Kawiwi, Waianae Kai, and Kamaileunu Ridge, (GDSI 2001; HINHP Database 2001).

Peucedanum sandwicense grows on cliffs, slopes, and ridges in Metrosideros *polymorpha* lowland mesic forest between 395 and 977 m (1,296 and 3,205 ft) elevation and is associated with native species such as *Dodonaea viscosa, Carex meyenii, Eragrostis* sp, *Santalum ellipticum* (iliahialoe), *Reynoldsia sandwicensis, Osteomeles anthyllidifolia, Scaevola sericea* (naupaka kahakai), *Senna gaudichaudii, Pittosporum halophilum* (hoawa), *Sida fallax, Plumbago zeylandica, Artemisia australis, Portulaca lutea* (ihi), *Lepidium bidentatum* var. *o-waihiense* (anaunau), *Schiedea globosa* (NCN), *Lipochaeta integrifolia* (nehe), *Peperomia remyi* (alaala wai nui), *Plechranthus parviflorus,* and *Dianella sandwicensis* (Constance and Affolter 1999; Service 1995b; HINHP Database 2001).

Threats to *Peucedanum sandwicense* on Oahu are habitat degradation by feral goats and pigs and competition with the non-native plant species *Schinus*

terebinthifolius, Melinis minutiflora, Kalanchoe pinnata, and *Lantana camara* (HINHP Database 2001).

Phlegmariurus nutans (Wawaeiole)

Phlegmariurus nutans is a member of the clubmoss family (Lycopodiaceae). This species can be distinguished from others of the genus in Hawaii by its epiphytic habit, simple or forking fruiting spikes, and larger and stiffer leaves (59 FR 14482).

This species has been observed fertile, with spores, in May and December. No other information is available on reproductive cycles, longevity, specific environmental requirements, or limiting factors (Service 1998b).

Historically, *Phlegmariurus nutans* was known from the island of Kauai and from scattered locations in the Koolau Mountains of Oahu, bounded by Kaluanui Valley to the north, Paalaa to the west, and Mount Tantalus to the south. On Oahu, this species is now known from only five populations containing seven individual plants on Federal and State lands Kaukonahua Gulch, Kahana, and Kaipapau Gulch, (HINHP Database 2001; GDSI 2001; EDA Database 2001).

Phlegmariurus nutans on Oahu grows on tree trunks, usually on open ridges, forested slopes, and cliffs in *Metrosideros polymorpha* dominated wet forests, cliffs, and shrublands and occasionally mesic forests between 227 and 846 m (745 and 2,775 ft) in elevation. Associated native plant species include *Machaerina angustifolia, Wikstroemia oahuensis, Antidesma platyphyllum, Syzygium sandwicensis, Elaphoglossum* sp. (ekaha), *Hibiscus* sp., *Psychotria mariniana, Cyrtandra laxiflora, Hedyotis terminalis, Broussaisia arguta,* or *Dicranopteris linearis* (HINHP Database 2001; EDA, *in litt.* 2001; Service 1998b).

The primary threat to *Phlegmariurus nutans* on Oahu is susceptibility to extinction from naturally caused events and decreased reproductive vigor because of the small number of remaining individuals and limited distribution of the species. Additional threats to *Phlegmariurus nutans* are feral pigs; floods; and the alien plants *Clidemia hirta, Paspalum conjugatum, Sacciolepis indica,* and *Psidium cattleianum* (HINHP Database 2001).

Phyllostegia mollis (NCN)

Phyllostegia mollis, a short-lived member of the mint family (Lamiaceae), grows as a nearly erect, densely hairy, nonaromatic, perennial herb. Leaves are oval in outline with rounded teeth. Flowers, usually in groups of six, are spaced along a stem; there are two shorter flowering stems directly below the main stem. The flowers have fused sepals and white petals fused into a tube and flaring into a smaller upper and a larger lower lip. Fruits are fleshy, dark green to black nutlets. A suite of technical characteristics concerning the kind and amount of hair, the number of flowers in a cluster, and details of the various plant parts separate this species from other members of the genus (Wagner *et al.* 1999).

Individual *Phyllostegia mollis* plants live for approximately 5 years. The species is known to flower in late winter and spring. Additional information on the life history of this plant, reproductive cycles, specific environmental requirements, and limiting factors is generally unknown (Service 1998b).

Historically, *Phyllostegia mollis* was known from the central and southern Waianae Mountains, from Mt. Kaala to Honouliuli, and from Makiki in the Koolau Mountains of Oahu; Molokai; and East Maui. Currently, this species is only known from Oahu and Maui. On Oahu, this species remains only in Kaluaa Gulch, Palawai Gulch, Puu Kumakalii, Mohiakea Gulch, Huliwai Gulch, Waieli Gulch, and Pualii Gulch on Federal and private lands. The eight populations contain between 85 and 105 individuals (HINHP Database 2001; GDSI 2001; EDA Database 2001).

Phyllostegia mollis typically grows on steep slopes and in gulches in diverse mesic to wet forests at elevations of 519 to 928 m (1,702 to 3,044 ft). Associated plant species include *Pouteria sandwicensis, Antidesma platyphyllum, Dryopteris unidentata, Carex meyenii, Metrosideros polymorpha, Chamaesyce multiformis, Acacia koa, Claoxylon sandwicense, Alyxia oliviformis, Myrsine* sp., *Diospyros hillebrandii, Psychotria hathewayi, Pipturus alba, Urera glabra,* or *Pisonia umbellifera* (HINHP Database 2001; EDA, *in litt.* 2001).

The major threats to *Phyllostegia mollis* are competition from the alien plant species *Passiflora suberosa, Psidium cattleianum, Kalanchoe pinnata, Blechnum occidentale, Clidemia hirta, Ageratina adenophora, Thelypteris parasitica, Heliocarpus popayanensis, Rubus rosifolius,* and *Schinus terebinthifolius;* rockslides; habitat degradation and predation by feral pigs and goats; and the small number of extant populations, which makes the species vulnerable to random mass mortality events (HINHP Database 2001).

Phyllostegia parviflora (NCN)

Phyllostegia parviflora, a member of the mint family (Lamiaceae), is a perennial herb with forward-bending hairs on the stems and straight or slightly curved hairs on the flowering stalk. The egg-shaped to broadly egg-shaped, wrinkled leaves are usually 19 to 33 cm (7.5 to 13 in) long and 7.5 to 15.3 cm (3 to 6 in) wide. The leaf surfaces are usually conspicuously dotted with coarse or stiff hairs, especially along the veins, and the edges are toothed. The leaf stalks are typically 6 to 13.5 cm (2.4 to 5.3 in) long, with straight, spreading hairs. Usually six hairy flowers are arranged along a flowering stalk with a main terminal stem and many side branches immediately below. The individual flower stalks are usually 8 to 15 mm (0.3 to 0.6 in) long with rather coarse or stiff hairs. The calyx is bell-shaped and has short, stiff hairs. The corolla is white, sometimes tinged with purple, and has short, stiff hairs. The upper corolla lip is about 3 mm (0.1 in) long while the lower lip is about 6 to 9 mm (0.2 to 0.4 in) long. The mature fruits are nutlets about 3 to 6 mm (0.1 to 0.2 in) long. The species is distinguished from others of the genus by the egg-shaped to broadly egg-shaped leaves, leaf stalks usually 6 to 13.5 cm (2.4 to 5.3 in) long, and the lower corolla lip 6 to 9 mm (0.24 to 0.36 in) long. *Phyllostegia parviflora* var. *glabriuscula* has fewer glandular hairs in the inflorescence, less pubescent leaves, and usually unbranched inflorescences compared with *Phyllostegia parviflora* var. *parviflora. Phyllostegia parviflora* var. *lydgatei* has shorter leaf stalks, spreading hairs on the leaf stalks, and fewer gland-tipped hairs in the inflorescence. At the time of listing of this species, only two varieties were recognized, *P. p.* var. *glabriuscula* and *P. p.* var. *parviflora.* Subsequent to the final rule listing this species in 1996, we became aware of Wagner *et al.* (1999) taxonomic treatment of this group in which *Phyllostegia parviflora* var. *lydgatei* was changed to variety status and recognized as distinct from *Phyllostegia parviflora* var. *parviflora.* Wagner *et al.* (1999) treatment is cited in the supplement in the revised edition of the Manual of the Flowering Plants of Hawaii as the basis for recognizing *Phyllostegia parviflora* var. *lydgatei.* This name change will be addressed in a future **Federal Register** notice (Wagner *et al.* 1999).

Historically, *Phyllostegia parviflora* was known from three islands Oahu, Hawaii, and Maui. This species is now known only from two populations on Oahu. *Phyllostegia parviflora* var.

glabriuscula was only known from the island of Hawaii on private land and has not been observed since the 1800s. *Phyllostegia parviflora* var. *parviflora* was known from Oahu and Maui, but is now known from only 30 plants on the east side of Puu Pauao, on State and Federal lands. *Phyllostegia parviflora* var. *lydgatei* is known from only four plants in North Pualii Gulch on private land (HINHP Database 2001; GDSI 2001).

Phyllostegia parviflora var. *lydgatei* is typically found on moderate to steep slopes in mesic forest from 555 to 881 m (1,820 to 2,890 ft) elevation. Native vegetation associated with *Phyllostegia parviflora* var. *lydgatei* includes *Xylosma hawaiiense, Claoxylon sandwicense, Antidesma platyphyllum, Pouteria sandwicensis, Pipturus albidus, Myrsine lessertiana, Chamaesyce multiformis, Coprosma foliosa, Dryopteris unidentata, Selaginella arbuscula,* or *Pipturus alba. Phyllostegia parviflora* var. *parviflora* is typically found in *Metrosideros polymorpha* mixed lowland wet forest from 232 to 867 m (761 to 2,844 ft) elevation. Native vegetation associated with *Phyllostegia parviflora* var. *parviflora* includes *Cibotium* sp., *Dicranopteris linearis, Broussaisia arguta, Antidesma* sp., *Pritchardia* sp. (loulu), *Tetraplasandra* sp., *Touchardia latifolia, Pipturus* sp., *Cheirodendron* sp. (Olapa), *Phyllostegia glabra* (NCN), *Cyrtandra* sp., *Syzygium sandwicensis,* or *Melicope* sp. (HINHP Database 2001).

The major threats to *Phyllostegia parviflora* var. *lydgatei* are habitat degradation and/or destruction by feral pigs; landslides, rockslides, competition with the alien plant species *Schinus terebinthifolius, Passiflora suberosa, Rubus rosifolius, Psidium cattleianum, Ageratina adenophora, Thelypteris parasitica,* and *Rivina humilis;* and extinction and/or reduced reproductive vigor due to the small number of remaining individuals and in each respective population. The major threats to *Phyllostegia parviflora* var. *parviflora* on Oahu are competition with the alien plant species *Clidemia hirta* and *Ageratina* sp.; and extinction and/or reduced reproductive vigor due to the small number of remaining individuals and in each respective population (HINHP Database 2001; Service 1999; 61 FR 53108).

Plantago princeps (laukahi kuahiwi)

Plantago princeps, a short-lived member of the plantain family (Plantaginaceae), is a small shrub or robust short lived perennial herb. This 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 *Plantago princeps.* Reproductive cycles, longevity, specific environmental requirements, and limiting factors are generally unknown. However, individuals have been observed in fruit from April through September (Service 1999).

Plantago princeps is historically and currently found on Kauai, Oahu, Molokai, and Maui. It is no longer extant on the island of Hawaii. *Plantago princeps* var. *anomala* is currently known from Kauai; var. *longibracteata* is known from Kauai and Oahu; var. *princeps* is known from Oahu; and var. *laxiflora* is known from Molokai and Maui. On Oahu, there are currently no remaining populations of var. *longibracteata,* and six remaining populations consisting of between 130 and 180 individuals of var. *princeps* on Federal, State, city, county, and private lands Palawai Gulch, Ekahanui Gulch, Nanakuli-Lualualei Ridge, Makua-Makaha Ridge, Mohiakea Gulch, and Pahole Gulch, (GDSI 2001; HINHP Database 2001; EDA Database 2001).

On Oahu, *Plantago princeps* var. *longibracteata* is typically found on the sides of waterfalls and wet rock faces at around 64 and 835 m (210 and 2,739 ft) elevation. Associated native plant species include *Lobelia gaudichaudii* (NCN), *Scaevola glabra, Bidens* sp., *Eugenia* sp., *Coprosma granadensis* (makole), or *Metrosideros rugosa* (HINHP Database 2001). *Plantago princeps* var. *princeps* is typically found on slopes and ledges in *Metrosideros polymorpha* lowland mesic forests and shrublands between 110 to 1,064 m (361 to 3,490 ft) elevation. Associated native plant species include *Lysimachia* sp., *Chamaesyce* sp., *Eragrostis* sp., *Pilea peploides, Artemisia australis, Viola* sp. (pamakani), *Dubautia plantaginea,* and *Bidens* sp. (HINHP Database 2001; EDA, *in litt.* 2001).

The primary threats to *Plantago princeps* var. *longibracteata* on Oahu are predation and habitat degradation by feral pigs and goats and competition with various alien plant species. The primary threats to *Plantago princeps* var. *princeps* on Oahu are rockslides and competition with the alien plant species *Erigeron karvinskianus, Melinis minutiflora,* and *Schinus terebinthifolius* (HINHP Database 2001; 59 FR 56333; Service 1999).

Platanthera holochila (NCN)

Platanthera holochila, a short-lived perennial and 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 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 (Service 1999).

Historically, *Platanthera holochila* was known from Maui, Oahu, Molokai, and Kauai. Currently, *Platanthera holochila* is extant on Kauai, Molokai, and Maui. This species was last collected on Oahu in 1938 in the area from Puu Kainapuaa to Kawainui-Kaipapau summit ridge and Kipapa Gulch (HINHP Database 2001).

On Oahu, *Platanthera holochila* was found in *Metrosideros polymorpha-Dicranopteris linearis* montane wet forest or *Metrosideros polymorpha* mixed montane bogs between 447 and 867 m (1,466 and 2,844 ft) elevation. Associated native plant species include *Cibotium* sp., *Coprosma ernodeoides* (kukae nene), *Styphelia tameiameiae*, *Wikstroemia* sp., *Scaevola chamissoniana* (naupaka kuahiwi), *Sadleria* sp., *Lythrum maritimum* (pukamole), *Deschampsia nubigena* (hair grass), *Luzula hawaiiensis* (wood rush), *Sisyrinchium acre* (mauu la ili), *Broussaisia arguta*, *Clermontia* sp. (oha wai), *Lycopodium cernuum* (wawaeiole), *Dubautia scabra* (naenae), *Polypodium pellucidum* (ae), *Mareletia gahniiformis* (NCN), and *Vaccinium reticulatum* (ohelo ai) (61 FR 53108; Service 1999).

Pteris lidgatei (NCN)

Pteris lidgatei, a short-lived member of the maidenhair fern family (Adiantaceae), is a coarse perennial herb, 0.5 to 1 m (1.6 to 3.3 ft) tall. It has a horizontal rhizome 1.5 cm (0.6 in) thick and at least 10 cm (3.9 in) long when mature. The fronds, including the leaf stalks, are 60 to 95 cm (24 to 37 in) long and 20 to 45 cm (8 to 18 in) wide. The leafy portion of the frond is oblong-deltoid to broadly ovate-deltoid, thick, brittle, and dark gray-green. The sori are apparently marginal in position, either fused into long linear sori, or more typically separated into distinct shorter

sori, with intermediate conditions being common. *Pteris lidgatei* can be distinguished from other species of *Pteris* in the Hawaiian Islands by the texture of its fronds and the tendency of the sori along the leaf margins to be broken into short segments instead of being fused into continuous marginal sori (Wagner and Wagner 1992; Wagner 1949).

Additional information on the life history of this plant, reproductive cycles, longevity, specific environmental requirements, and limiting factors is generally unknown (Service 1998a).

Historically, *Pteris lidgatei* was found on Oahu, Molokai, and West Maui. Currently, this species is known from Oahu and Maui. Five populations with approximately 13 individuals occur on Oahu on Federal, State, and private lands Kaluanui, Kawainui drainage, Kaukonahua Gulch, Kawai Iki Stream, Waimano Stream and Waimano Gulch, (GDSI 2001; HINHP Database 2001; EDA Database 2001).

Pteris lidgatei on Oahu grows on steep stream banks and cliffs around 75 m (246 ft) elevation in wet *Metrosideros polymorpha-Dicranopteris linearis* forest with *Cyrtandra* sp., *Machaerina angustifolia, Selaginella arbuscula, Isachne pallens, Thelypteris sandwicensis, Diploterygium pinnatum., Sadleria* sp., *Broussaisia arguta, Cibotium chamissoi, Dicranopteris linearis, Elaphoglossum crassifolium* (ekaha), *Sadleria squarrosa, Asplenium* sp. (NCN), *Doodia lyonii* (NCN), or *Sphenomeris chusana* (palaa) (HINHP Database 2001; EDA, *in litt.* 2001).

The primary threats to *Pteris lidgatei* on Oahu are competition with the alien plant species *Psidium cattleianum, Sacciolepis indica, Thelypteris parasitica, Ageratina riparia, Paspalum conjugatum, Pterolepis glomerata*, and *Clidemia hirta*; habitat destruction by feral pigs, and a risk of extinction due to random environmental events and a risk of extinction from naturally occurring events and/or reduced reproductive vigor due to the small number of remaining individuals (HINHP Database 2001).

Sanicula purpurea (NCN)

Sanicula purpurea, a short-lived member of the parsley family (Apiaceae), is a stout perennial herb, 8 to 36 cm (3 to 14 in) tall, arising from a massive perennial stem. The stems are tufted and branched, with the lower portion of the stem lying close to the ground, while the upper portion rises above the ground. The basal leaves are numerous and leathery in texture and are kidney-shaped or circular to egg-heart-shaped, with three to seven lobes. The leaf lobes are circular to inversely egg-shaped. The leaf veins are impressed on the upper surface and prominent on the lower surface. The leaf margins bear short, sharp teeth. The basal leaf stalks are slender and abruptly sheathed at the base. The leaves are palmately three-to five-lobed. The small purple, or cream-colored with a purple tinge, flowers occur in branched terminal clusters, each of which contains six to ten flowers. Each flower cluster contains one to three perfect flowers and five to seven staminate flowers. Below the inflorescence is a series of about ten oblong or inversely lance-shaped bracts. The nearly spherical fruits are covered with prickles. This species is distinguished from others in the genus by the number of flowers per cluster and by the color of the petals (Constance and Affolter 1999).

Additional information on the life history of *Sanicula purpurea*, reproductive cycles, longevity, specific environmental requirements, and limiting factors is generally unknown (Service 1999).

Historically and currently, *Sanicula purpurea* is known from Oahu and West Maui. On Oahu, four populations totaling between 21 individuals are currently known from Kaukonahua-Kahana Divide, Helemano-Punaluu Divide, the summit between Aiea and Waimano, and North Kaukonahue-Punaluu on Federal, State, and private lands (GDSI 2001; HINHP Database 2001; EDA Database 2001).

Sanicula purpurea on Oahu typically grows in open *Metrosideros polymorpha* mixed montane bogs and windswept shrublands within the cloud zone between 415 and 959 m (1,361 and 3,146 ft) elevation. Associated plant species include *Cheirodendron* sp., *Sadleria pallida, Bidens* sp., *Dicanthelium koolauensis, Styphelia tameiameiae, Gahnia beechyi, Plantago pachyphylla* (laukahi kuahiwi), *Lycopodium* sp., *Vaccinium* sp., or *Machaerina angustifolia* (HINHP Database 2001; EDA, *in litt.* 2001).

The major threats to *Sanicula purpurea* on Oahu are habitat degradation by feral pigs; a risk of extinction due to random environmental events, and/or reduced reproductive vigor due to the small number of existing populations; sun exposure; and competition with the alien plant species *Axonopus fissifolius* and *Clidemia hirta* (61 FR 53108; Service 1999; HINHP Database 2001).

Schiedea hookeri (NCN)

Schiedea hookeri, a member of the pink family (Caryophyllaceae), is a sprawling or clumped perennial herb. The stems, 0.3 to 0.5 m (1 to 1.6 ft) long, curve slightly upward or lie close to the ground and often produce matted clumps. The thin, opposite leaves are narrowly lance-shaped to narrowly elliptic. The petalless, perfect flowers are borne in open branched inflorescences, which are hairy, somewhat sticky, and 5 to 22 cm (2 to 9 in) long. The lance-shaped sepals are green to purple and 3 to 4.5 mm (1.2 to 1.8 in) long. The fruit is a capsule about 3 mm (0.1 in) long. This species is distinguished from others in this endemic Hawaiian genus by its open, hairy, and sometimes sticky inflorescence, and by the size of the capsules (Wagner *et al.* 1999).

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

clonal spread. In contrast, clonal growth has been detected for individuals at Kaluaa Gulch, where the growth form is decumbent and plants apparently root at the nodes (Service 1999; HINHP Database 2001; Weller and Sakai, unpublished data).

Historically, *Schiedea hookeri* was known from the Waianae Mountains of Oahu and from a single fragmentary collection from Haleakala on Maui that may represent *Schiedea menziesii* rather than *Schiedea hookeri*. Currently, this species is known from 17 populations on Oahu containing between 328 and 378 individuals in East Makaleha, Makaha-Waianae Kai Ridge, Kaluakauila Gulch, between Kalaulula and Kanewai Streams, Kaluaa Gulch, north of Puu Ku Makalii, Waianae Kai, Makua-Makaha Ridge, between Kolekole Pass and Puu Hapapa, southwest of Puu Kaua, Palikea Gulch, Makaha, Kamaileunu Ridge, and Kahanahaiki on Federal, State, city, county, and private lands (HINHP Database 2001; GDSI 2001; EDA Database 2001; Service 1999).

Schiedea hookeri on Oahu is usually found on slopes, cliffs and cliff bases, rock walls, and ledges in diverse mesic or dry lowland forest, often with *Metrosideros polymorpha, Diospyros sandwicensis*, or *Diospyros hillebrandii* dominant, and at elevations between 208 and 978 m (682 and 3,208 ft). Associated plants species include *Carex wahuensis, Psydrax odorata, Acacia koa, Bidens torta, Alyxia oliviformis, Pouteria sandwicensis, Hibiscus* sp., *Charpentiera tomentosa, Styphelia tameiameiae, Sida fallax, Pisonia sandwicensis, Lipochaeta tenuis, Stenogyne* sp., *Antidesma pulvinatum, Elaeocarpus bifidus, Dodonaea viscosa, Artemisia australis, Carex meyenii*, or *Eragrostis grandis* (Service 1999).

The primary threats to *Schiedea hookeri* on Oahu are habitat degradation and/or destruction by feral goats and pigs; competition with the alien plants species *Schinus terebinthifolius, Kalanchoe pinnata, Blechnum occidentale, Passiflora suberosa, Clidemia hirta, Heliocarpus popayanensis, Psidium cattleianum, Ageratina riparia, Thelypteris parasitica, Toona ciliata, Melia azedarach, Grevillea robusta, Aleurites moluccana, Syzygium cumini, Panicum maximum, Hyptis pectinata, Lantana camara, Ageratina adenophora, Adiantum hispidulum, Melinis minutiflora, Pimenta dioica, Psidium guajava*, and *Cordyline fruticosa*; and predation by introduced slugs and snails. The Kaluakauila Gulch population is also potentially threatened by fire and military activities (Service 1999).

Schiedea nuttallii (NCN)

Schiedea nuttallii, a member of the pink family (Caryophyllaceae), is a generally hairless, erect subshrub. This 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, smaller leaves, smaller flowers, and smaller seeds (Wagner *et al.* 1999).

Little is known about the life history of *Schiedea nuttallii*. Based on field and greenhouse observations, it is hermaphroditic (flowers contain both sexes). Plants located close to the Makua rim 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 pollinated, suggesting that this species requires insects for pollination. Seedlings of *Schiedea* occurring in mesic or wet sites are apparently consumed by introduced slugs and snails. These have been observed feeding on *Schiedea membranacea*, another mesic forest species occurring on Kauai. In contrast to mesic forest species, *Schiedea* occurring in dry areas produce abundant seedlings following winter rains, presumably because there are fewer alien predators in drier sites. Fruits and flowers are abundant in the wet season but can be found throughout the year. Reproductive cycles, longevity, specific environmental requirements, and limiting factors are unknown (Service 1999).

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

Schiedea nuttallii on Oahu typically grows on rock walls, forested slopes, and steep walls in *Acacia koa-Metrosideros polymorpha* lowland mesic forest and *Metrosideros polymorpha-Dodonaea viscosa* forest at elevations between 436 and 1185 m (1,430 and 3,887 ft). Associated native plant species include *Alyxia oliviformis, Bidens torta, Psydrax odorata, Cibotium chamissoi, Hedyotis terminalis, Perrottetia sandwicensis, Ilex anomala, Coprosma* sp., *Peperomia* sp., *Machaerina* sp., *Pipturis* sp., *Antidesma platyphyllum,* or the endangered *Cyanea longiflora,* (HINHP Database 2001; EDA, *in litt.,* 2001).

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

Sesbania tomentosa (Ohai)

Sesbania tomentosa, a short lived perennial and a member of the pea family (Fabaceae), is typically a sprawling shrub but may also be a small tree. Each compound leaf consists of 18 to 38 oblong to elliptic leaflets which are usually sparsely to densely covered with silky hairs. The flowers are salmon tinged with yellow, orange-red, scarlet or rarely, pure yellow. *Sesbania tomentosa* is the only endemic Hawaiian species in the genus, differing from the naturalized *Sesbania 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. Other aspects of this plant's life history are unknown (Service 1999).

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). It is no longer extant on Niihau and Lanai. On Oahu, *Sesbania tomentosa* is known from three populations of 54 to 55 wild and approximately 200 outplanted individuals on State-owned land within the Kaena Point NAR and from Keawaula on State and private lands (HINHP Database 2001; GDSI 2001; 59 FR 56333; Service 1999).

On Oahu, *Sesbania tomentosa* is found on cliff faces, broken basalt, and

sand dunes with rock outcrops in *Scaevola sericea* coastal dry shrubland and *Sporobolus virginicus* (aki aki), mixed grasslands between sea level and 152 m (499 ft) elevation. Associated plant species include *Heliotropium* sp. (ahinahina), *Jacquemontia sandwicensis, Myoporum sandwicense,* or *Sida fallax, Lipochaeta* sp., (HINHP Database 2001; Service 1999).

The primary threats to *Sesbania tomentosa* on Oahu are competition with the alien plant species *Leucana leucocephala* and *Lantana camara;* lack of adequate pollination; seed predation by rats, mice and, potentially, non-native insects; and destruction by random environmental events (e.g., fire); hikers; and motorcycles and other all terrain vehicles (59 FR 56333; Service 1999; HINHP Database 2001).

Silene lanceolata (NCN)

Silene lanceolata, a member of the pink family, is an upright, perennial plant with stems 15 to 50 cm (6 to 20 in) long, which are woody at the base. The narrow leaves are smooth except for a fringe of hairs near the base. Flowers are arranged in open clusters. The flowers are white with deeply-lobed, clawed petals. The capsule opens at the top to release reddish-brown seeds. This species is distinguished from *Silene alexandri,* the only other member of the genus found on Molokai, by its smaller flowers and capsules and its stamens, which are shorter than the sepals (Wagner *et al.* 1999).

Currently, no life history information is available for *Silene lanceolata* (Service 1996d).

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

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

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

Solanum sandwicense (Popolo aiakeakua)

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

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

Historically, *Solanum sandwicense* was known from both Oahu and Kauai. Currently, this species is only known from Kauai (Joan Yoshioka, TNCH, pers. comm., 2000; HINHP Database 2001; GDSI Database 2001; 65 FR 66808 59 FR 09304; Service 1995b).

Solanum sandwicense on Oahu was found on talus slopes and in streambeds in open, sunny areas at elevations between 131 and 1,006 m (430 and 3,300 ft). Associated plant species included *Pisonia* sp. or *Psychotria* sp. (59 FR 09304; Service 1995b; HINHP Database 2001).

The major threats to populations of *Solanum sandwicense* on Oahu were habitat degradation by feral pigs; and competition with alien the plant species *Passiflora suberosa, Psidium* sp., and *Schinus terebinthifolius;* fire; landslides; and a risk of extinction from naturally occurring events and reduced reproductive vigor due to the small number of existing individuals (59 FR 09304; Service 1995b; HINHP Database 2001).

Spermolepis hawaiiensis (NCN)

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).

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

Historically and currently, *Spermolepis hawaiiensis* is known from Kauai, Oahu, Lanai and the island of Hawaii. On Oahu, there are two known populations totaling between 110 and 910 individuals, on Makua-Keaau Ridge and near the entrance of Diamond Head on State, Federal, city, and county lands (HINHP Database 2001; GDSI 2001; EDA Database 2001).

Spermolepis hawaiiensis on Oahu typically grows on steep-vertical cliffs or at the base of cliffs and ridges in coastal dry cliff vegetation at elevations of 25 to 839 m (82 to 2,752 ft). Associated plant species include *Dodonaea viscosa, Artemisia australis, Bidens* sp., *Santalum ellipticum, Waltheria indica, Heteropogon contortus,* or *Doryopteris* sp. (HINHP Database 2001; EDA, *in litt.,* 2001).

The primary threats to *Spermolepis hawaiiensis* on Oahu are habitat degradation by feral goats; competition with various alien plant species such as *Melinis minutiflora, Lantana camara,* and grasses; and habitat destruction and extinction due to natural environmental events such as erosion, landslides, and rockslides due to natural weathering (HINHP Database 2001; 59 FR 56333; Service 1999).

Tetramolopium lepidotum ssp. *lepidotum* (NCN)

Tetramolopium lepidotum ssp. *lepidotum,* a member of the aster family (Asteraceae), is an erect shrub 12 to 36 cm (4.7 to 14 in) tall, branching near the ends of the stems. Leaves of this taxon are lance-shaped, wider at the leaf tip, and measure 25 to 45 mm (1.0 to 1.8 in) long and 1 to 7 mm (0.04 to 0.3 in) wide. Flower heads are arranged in groups of six to 12. The involucre is bell-shaped and less than 4 mm (0.2 in) high. Florets are either female or bisexual, with both occurring on the same plant. There are 21 to 40 white to pinkish lavender ray florets 1 to 2 mm (0.04 to 0.08 in) long on the periphery of each head. In the center of each head there are four to eleven maroon to pale salmon disk florets. The fruits are achenes, 1.6 to 2.5 mm (0.06 to 0.1 in) long and 0.5 to 0.8 mm (0.02 to 0.03 in) wide. This taxon can be distinguished from the other extant species on Oahu by its hermaphroditic (having both male and female flowers) disk flowers and its

inflorescence of six to 12 heads (Lowrey 1999).

Tetramolopium lepidotum ssp. *lepidotum* is a short-lived perennial that has been observed producing fruit and flowers from April through July. No further other information is available on reproductive cycles, longevity, specific environmental requirements, or limiting factors (59 FR 09304; Service 1995b).

Historically, *Tetramolopium lepidotum* ssp. *lepidotum* was known from nearly the entire length of the Waianae Mountains, from Makua Valley to Cachexia Ridge, as well as from the island of Lanai. On Oahu, a total of four populations of approximately 15 individual plants are currently known from Federal, State, and private lands on Mauna Kapu, Ekahanui-Lualualei summit, Waianae Kai, and Puu Hapapa. TNCH has outplanted three individuals in a fenced exclosure within Honouliuli Preserve. These individuals have since died, yet two healthy *Tetramolopium lepidotum* ssp. *lepidotum* have sprouted near the exclosure (56 FR 55770; Lowrey 1999; Service 1998b; HINHP 2001; GDSI 2001; EDA Database 2001).

Tetramolopium lepidotum ssp. *lepidotum* typically grows on grassy ridge tops, slopes, or cliffs in windblown dry forests at elevations of 330 to 1,157 m (1,082 to 3,795 ft). Associated species include *Eragrostis* sp., *Carex wahuensis, Bidens* sp., or *Metrosideros polymorpha* (HINHP Database 2001).

The major threats to *Tetramolopium lepidotum* ssp. *lepidotum* on Oahu are competition from the alien plant species *Schinus terebinthifolius, Melinis minutiflora,* and *Andropogon virginicus;* habitat degradation and predation by goats and pigs; fire; and the small number of populations (Service 1998b; 56 FR 55770; HINHP Database 2001).

Vigna o-wahuensis (NCN)

Vigna o-wahuensis, a member of the pea family (Fabaceae), is a slender twining perennial herb with fuzzy stems. Each leaf is made up of three leaflets which vary in shape from round to linear, and are sparsely or moderately covered with coarse hairs. Flowers, in clusters of one to four, have thin, translucent, pale yellow or greenish yellow petals. The two lowermost petals are fused and appear distinctly beaked. The sparsely hairy calyx has asymmetrical lobes. The fruits are long slender pods that may or may not be slightly inflated and contain seven to 15 gray to black seeds. This species differs from others in the genus by its thin yellowish petals, sparsely hairy calyx, and thin pods which may or may not be slightly inflated (Geesink *et al.* 1999).

Additional information on the life history of this plant, reproductive cycles, longevity, specific environmental requirements, and limiting factors are generally unknown (Service 1999).

Historically, *Vigna o-wahuensis* was known from Niihau, Oahu, and Maui. Currently, *Vigna o-wahuensis* is known from the islands of Molokai, Lanai, Kahoolawe, Maui, and Hawaii. There are no currently known populations on Niihau or Oahu. The last collection on Oahu was made in 1938 on the Mokulua Islets and North Islet (HINHP Database 2001).

Vigna o-wahuensis on Oahu occurred on open dry fossil reef, climbing over shrubs and grasses on limestone deposit and on fairly steep slopes from sea level to 609 m (0 to 1,998 ft) in elevation. The associated native plant species for this plant are unknown for Oahu (HINHP Database 2001).

The threats for this species are unknown for Oahu.

A summary of populations and landownership for these 101 plant species reported from Oahu is given in Table 2.

TABLE 2.—SUMMARY OF EXISTING POPULATIONS OCCURRING ON OAHU, AND LANDOWNERSHIP FOR 101 SPECIES REPORTED FROM OAHU

Species	Number of current populations	Landownership/jurisdiction		
		Federal	State	Private
Abutilon sandwicense	16	X [2 6]	X	X
Adenophorus periens	0			
Alectryon macrococcus	34	X[1 2 6]	X	X
Alsinidendron obovatum	5	X[1]	X	
Alsinidendron trinerve	3	X[2]	X	
Bonamia menziesii	16	X[1 6]	X	X
Cenchrus agrimonioides	8	X[1 2]	X	X
Centaurium sebaeoides	3		X	X
Chamaesyce celastroides var. kaenana	13	X[1]	X	
Chamaesyce deppeana	1		X	
Chamaesyce herbstii	4		X	X
Chamaesyce kuwaleana	4	X[6]	X	
Chamaesyce rockii	16	X [2 3 8]	X	X
Colubrina oppositifolia	5		X	X
Ctenitis squamigera	4	X[1 2]	X	X
Cyanea acuminata	22	X[2 3 8]	X	X
Cyanea crispa	11	X[3]	X	X
Cyanea grimesiana ssp. grimesiana	6	X[2]	X	X
Cyanea grimesiana ssp. obatae	6		X	X
Cyanea humboltiana	8	X[3,8]	X	X
Cyanea koolauensis	25	X[2 3 4 8]	X	X
Cyanea longiflora	4		X	X
Cyanea pinnatifida	0			
Cyanea st.-johnii	6	X[3]	X	X
Cyanea superba	1	X[1]	X	
Cyanea truncata	1		X	X
Cyperus trachysanthos	6	X[7]	X	
Cyrtandra crenata	0			
Cyrtandra dentata	8	X[1 3]	X	
Cyrtandra polyantha	1		X	X
Cyrtandra subumbellata	2	X[2 8]	X	X

TABLE 2.—SUMMARY OF EXISTING POPULATIONS OCCURRING ON OAHU, AND LANDOWNERSHIP FOR 101 SPECIES REPORTED FROM OAHU—Continued

Species	Number of current populations	Landownership/jurisdiction		
		Federal	State	Private
Cyrtandra viridiflora	8	X[38]	X	X
Delissea subcordata	18	X[12]	X	X
Diellia erecta	1		X	X
Diellia falcata	29	X[126]	X	X
Diellia unisora	4		X	X
Diplazium molokaiense	0			
Dubautia herbstobatae	4	X[1]	X	
Eragrostis fosbergii	4	X[2]	X	
Eugenia koolauensis	10	X[34]	X	X
Euphorbia haeleeleana	6	X[1]	X	X
Flueggea neowawraea	19	X[126]	X	X
Gardenia mannii	31	X[2348]	X	X
Gouania meyenii	3		X	X
Gouania vitifolia	2		X	X
Hedyotis coriacea	0			
Hedyotis degeneri	5	X[1]	X	
Hedyotis parvula	5	X[16]	X	
Hesperomannia arborescens	23	X[348]	X	X
Hesperomannia arbuscula	6		X	X
Hibiscus brackenridgei	6	X[16]	X	X
Isodendrion laurifolium	5		X	X
Isodendrion longifolium	4	X[2]	X	X
Isodendrion pyrifolium	0			
Labordia cyrtandrae	9		X	X
Lepidium arbuscula	10	X[126]	X	
Lipochaeta lobata var. leptophylla	5	X[26]	X	
Lipochaeta tenuifolia	12	X[126]	X	
Lobelia gaudichaudii ssp. koolauensis	4	X[238]	X	X
Lobelia monostachya	1		X	X
Lobelia niihauensis	21	X[126]	X	
Lobelia oahuensis	10	X[1238]	X	X
Lysimachia filifolia	1		X	
Mariscus pennatiformis	0			
Marsilea villosa	4	X[6]	X	X
Melicope lydgatei	4	X[3]	X	X
Melicope pallida	1		X	X
Melicope saint-johnii	5	X[6]		X
Myrsine juddii	3	X[3]	X	
Neraudia angulata	5	X[126]	X	X
Nototrichium humile	21	X[126]	X	X
Peucedanum sandwicense	4		X	
Phlegmariurus nutans	5	X[238]	X	
Phyllostegia hirsuta	23	X[2368]	X	X
Phyllostegia kaalaensis	4		X	X
Phyllostegia mollis	8	X[2]	X	
Phyllostegia parviflora	2	X[3]	X	X
Plantago princeps	6	X[1236]	X	X
Platanthera holochila	0			
Pritichardia kaalae	6	X[12]	X	
Pteris lidgatei	5	X[238]	X	X
Sanicula mariversa	4	X[16]	X	
Sanicula purpurea	4	X[238]	X	X
Schiedea hookeri	17	X[126]	X	X
Schiedea kaalae	8		X	X
Schiedea kealiae	4	X[5]	X	X
Schiedea nuttallii	5	X[12]	X	X
Sesbania tomentosa	3		X	X
Silene lanceolata	2	X[1]	X	
Silene perlmanii	0			
Solanum sandwicense	0			
Spermolepis hawaiiensis	2	X[1]	X	
Stenogyne kanehoana	1			X
Tetramolopium filiforme	6	X[16]	X	
Tetramolopium lepidotum ssp. lepidotum	4	X[26]	X	X
Tetraplasandra gymnocarpa	20	X[2348]	X	X
Trematalobelia singularis	3		X	X
Urera kaalae	11	X[26]	X	X
Vigna o-wahuensis	0			
Viola chamissoniana ssp. chamissoniana	5	X[126]	X	

TABLE 2.—SUMMARY OF EXISTING POPULATIONS OCCURRING ON OAHU, AND LANDOWNERSHIP FOR 101 SPECIES REPORTED FROM OAHU—Continued

Species	Number of current populations	Landownership/jurisdiction		
		Federal	State	Private
Viola oahuensis	9	X[2 3 8]	X	X

[1] Makua Military Reservation.
[2] Schofield Barracks Military Reservation/Schofield Barracks East Range.
[3] Kawailoa Training Area.
[4] Kahuku Training Area.
[5] Dillingham Military Reservation.
[6] Naval Magazine Pearl Harbor Lualualei Branch and Naval Computer and Telecommunication Area Master Station Pacific Transmitting Facility at Lualualei.
[7] Hawaii Army National Guard.
[8] Oahu Forest National Wildlife Refuge.

Previous Federal Action

Federal action on these plants began as a result of section 12 of the Endangered Species Act of 1973, as amended (Act) (16 U.S.C. 1531 *et seq.*), 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, *Abutilon sandwicense* (as *Abutilon sandwicense* var. *sandwicense*), *Adenophorus periens, Alectryon macrococcus* (as *Alectryon macrococcum* var. *macrococcum* and *Hesperomannia arborescens* var. *bushiana* and var. *swezeyi*), *Hesperomannia arbuscula, Hibiscus brackenridgei* (as *Hibiscus brackenridgei* var. *brackenridgei,* var. *mokuleianus,* and var. ''from Hawaii''), *Lipochaeta lobata* var. *leptophylla, Lobelia gaudichaudii* ssp. *koolauensis* (as *Lobelia gaudichaudii* var. *koolauensis*), *Lobelia niihauensis, Lobelia oahuensis, Marsilea villosa, Melicope lydgatei* (as *Pelea descendens* and *Pelea lydgatei*), *Melicope pallida* (as *Pelea leveillei* and *Pelea pallida*), *Melicope saint-johnii* (as *Pelea saint-johnii* var. *elongata*), *Neraudia angulata, Nototricium humile, Peucedanum sandwicense, Phyllostegia mollis, Plantago princeps* (as *Plantago princeps* var. *elata,* var. *laxifolia,* var. *princeps*), *Lipochaeta lobata* var. *leptophylla, Lobelia gaudichaudii* ssp. *koolauensis* (as *Lobelia gaudichaudii* var. *koolauensis*), *Lobelia niihauensis, Lobelia oahuensis, Marsilea villosa, Pritchardia kaalae* (as *Pritchardia kaalae* var. *kaalae* and var. *minima*), *Schiedea kaalae, Schiedea kealiae, Sesbania tomentosa* (as *Sesbania hobdyi* and *Sesbania tomentosa* var. *tomentosa*), *Silene lanceolata, Solanum sandwicense* (as *Solanum hillebrandii* and *Solanum kauaiense*), *Tetramolopium lepidotum* ssp. *lepidotum, Tetraplasandra gymnocarp*a (as *Tetraplasandra gymnocarpa* var. *pupukeensis*), *Urera kaalae, Vigna o-wahuensis* (as *Vigna sandwicensis* var. *heterophylla* and var. *sandwicensis*), *Viola chamissoniana* ssp. chamissoniana (as *Viola chamissoniana*), and *Viola oahuensis* were considered endangered; *Diellia erecta, Diellia unisora, Huperzia nutans* (as *Lycopodium nutans*), *Lipochaeta tenuifolia, Lobelia monostachya* (as *Lobelia hillebrandii* var. *monostachya*), *Lysimachia filifolia,* and *Phyllostegia hirsuta* (as *Phyllostegia hirsuta* var. *hirsuta* and var. *laxior*) were considered threatened; and, *Chamaesyce deppeana* (as *Euphorbia deppeana*), *Ctenitis squamigera, Diplazium molokaiense, Eugenia koolauensis* (as *Eugenia molokaiana*), *Gouania meyenii, Gouania vitifolia, Hedyotis cookiana, Hedyotis coriacea, Isodendrion pyrifolium, Plantago princeps* (as *Plantago princeps* var. *acaulis,* var. *denticulata,* and var. *queleniana*), *Pteris lidgatei,* and *Tetramolopium filiforme,* were considered to be extinct. On July 1, 1975, we published a notice in the **Federal Register** (40 FR 27823) of our 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 our intention to review the status of the plant taxa named therein. As a result of that review, on June 16, 1976, we 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 considered to be endangered or thought to be extinct; *Diellia erecta* was also included in the 1976 document. 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 are summarized in an April 26, 1978, **Federal Register** publication (43 FR 17909). In 1978, amendments to the Act required that all proposals over 2 years old be withdrawn. A 1-year grace period was given to proposals already over 2 years old. On December 10, 1979, we 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. We 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), September 30, 1993 (58 FR 51144), February 28, 1996 (61 FR 7596). A summary of the status categories for these 101 plant species in the 1980–1996 notices of review can be found in Table 3(a). We listed the 101 species as endangered or threatened between 1991 and 1996. A summary of the listing actions can be found in Table 3(b).

TABLE 3(a).—SUMMARY OF CANDIDACY STATUS FOR 101 PLANT SPECIES FROM OAHU

Species	**Federal Register** notice of review			
	12/15/80	9/27/85	2/20/90	9/30/93
Abutilon sandwicense	C1	C1	C1	
Adenophorus periens	C1	C1	C1	

TABLE 3(a).—SUMMARY OF CANDIDACY STATUS FOR 101 PLANT SPECIES FROM OAHU—Continued

Species	**Federal Register** notice of review			
	12/15/80	9/27/85	2/20/90	9/30/93
Alectryon macrococcus	C1	C1	C1	
Alsinidendron obovatum	C1	C1	C1	
Alsinidendron trinerve	C1	C1	C1	
Bonamia menziesii	C1	C1	C1	
Cenchrus agrimonioides				
Centaurium sebaeoides	.....	.....	C1	
Chamaesyce celastroides var. *kaenana*				
Chamaesyce deppeana	C1	C1	C1	
Chamaesyce herbstii	.....	.....	C1	
Chamaesyce kuwaleana	C1	C1	C1	
Chamaesyce rockii	3A	3A	C1	
Colubrina oppositifolia				
Ctenitis squamigera	C1	C1	C1	
Cyanea acuminata				
Cyanea crispa	C1	C1	C1	
Cyanea grimesiana ssp. *grimesiana*	C1*	C1*	C1*	
Cyanea grimesiana ssp. *obatae*	C1	C1	.....	C2
Cyanea humboltiana	.....	.....	C2	
Cyanea koolauensis	C1	C1	3C	
Cyanea longiflora				
Cyanea pinnatifida	C1	C1		
Cyanea st.-johnii	C1	C1	C1	
Cyanea superba	C1	C1	3C	
Cyanea truncata	C1	C1	C1	
Cyperus trachysanthos	.....	.....	C1	
Cyrtandra crenata	.....	.....	.....	C2
Cyrtandra dentata	C1	C1	C1	
Cyrtandra polyantha	.....	.....	3C	
Cyrtandra subumbellata	C1	C1	C1	
Cyrtandra viridiflora	C1	C1	C2	C2
Delissea subcordata	.....	.....	.....	C2
Diellia erecta	3C	3C		
Diellia falcata	C1	C1	C1	
Diellia unisora	C1	C1	C1	
Diplazium molokaiense	C1	C1	C1*	
Dubautia herbstobatae	C1*	C1*	C1	
Eragrostis fosbergii	C1	C1	C1	
Eugenia koolauensis	C1	C1	C1*	C2*
Euphorbia haeleeleana	C1	C1	C1	
Flueggea neowawraea	C1	C1	C1	
Gardenia mannii				
Gouania meyenii	3A	3A	C1	
Gouania vitifolia	C1*	C1*	C1*	
Hedyotis coriacea	3A	3A	C1	
Hedyotis degeneri	C1	C1	C1	
Hedyotis parvula	C1	C1	C1	
Hesperomannia arborescens	C1	C1	C1	
Hesperomannia arbuscula	C1	C1	C1	
Hibiscus brackenridgei	C1	C1	C1	
Isodendrion laurifolium	C1	C1	C1	
Isodendrion longifolium	C1	C1	C1	C2
Isodendrion pyrifolium	C1	C1	C1	3C
Labordia cyrtandrae	C1*	C1*	3A	
Lepidium arbuscula	.....	.....	C2	C2
Lipochaeta lobata var. *leptophylla*	.....	C1*	C2	C2
Lipochaeta tenuifolia	C1	C1	C1	
Lobelia gaudichaudii ssp. *koolauensis*	C1	C1	C1	
Lobelia monostachya	C1	C1	3B	
Lobelia niihauensis	.....	C1	3A	
Lobelia oahuensis	C1	C1	C1	
Lysimachia filifolia	C1	C1	C1	
Mariscus pennatiformis	C2	C2	C1	
Marsilea villosa	.....	.....	C1	
Melicope lydgatei	.....	.....	.....	C2
Melicope pallida	.....	C1	C1	.....
Melicope saint-johnii	C1	C1	C1	
Myrsine juddii	C1	C1	C1*	
Neraudia angulata	.....	.....	C1*	.....
Nototrichium humile	C1	C1	3C	
Peucedanum sandwicense	C1	C1	C1	

TABLE 3(a).—SUMMARY OF CANDIDACY STATUS FOR 101 PLANT SPECIES FROM OAHU—Continued

Species	Federal Register notice of review			
	12/15/80	9/27/85	2/20/90	9/30/93
Phlegmariurus nutans	C1	C1	C1	
Phyllostegia hirsuta	C2	C2	C2	
Phyllostegia kaalaensis	C1	C2	3C	
Phyllostegia mollis				
Phyllostegia parviflora	C1	C1	C1	
Plantago princeps				
Platanthera holochila	C2	C2	C1	
Pritchardia kaalae	C1	C1	C1	C2
Pteris lidgatei	3C	3C		
Sanicula mariversa	.....	.....	C1	.....
Sanicula purpurea	.....	.....	C1	.....
Schiedea hookeri	.....	.....	.....	C2
Schiedea kaalae	C1	C1	C1	
Schiedea kealiae	3C	3C		
Schiedea nuttallii	.....	.....	.....	C2
Sesbania tomentosa	C1*	C1*	C1	
Silene lanceolata	C1	C1	C1	
Silene perlmanii	.....	.....	C1	
Solanum sandwicense	C1*	C1*	C1	
Spermolepis hawaiiensis	.....	.....	C1	
Stenogyne kanehoana	C1	C1	C1	
Tetramolopium filiforme	C1	C1	C1	
Tetramolopium lepidotum ssp. *lepidotum*	C1	C1	C1	
Tetraplasandra gymnocarpa	3B	3B	C1	
Trematalobelia singularis	.....	.....	C2	C2
Urera kaalae	C1	C1	C1	
Vigna o-wahuensis	C1	C1	C1	
Viola chamissoniana ssp. *chamissoniana*	C1	C1	C1	
Viola oahuensis	C1	C1	C2	C2

Key:
C: Taxa for which the Service has on file sufficient information on the biological vulnerability and threat(s) to support proposals to list them as endangered or threatened species. (The 1996 Notice of Review discontinued the use of different categories of candidates (as described below; candidates were redefined as species meeting the definition of former C1 species.)
C1: Taxa for which the Service has on file enough sufficient 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.
3B: Names that, on the basis of current taxonomic understanding (usually as represented in published revisions and monographs), do not represent distinct taxa meeting the Act's definition of ''species''. Such supposed entities could be reevaluated in the future on the basis of new information.
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. If further research or changes in habitat conditions indicate a significant decline in any of these taxa, they may be reevaluated for possible inclusion in categories 1 or 2.
Federal Register Notices of Review:
1980: 45 FR 82479
1985: 50 FR 39525
1990: 55 FR 6183
1993: 58 FR 51144
1996: 61 FR 7596

TABLE 3(b).—SUMMARY OF LISTING ACTIONS FOR 101 PLANT SPECIES FROM OAHU

Species	Federal status	Proposed rule		Final rule		Proposed critical habitat	
		Date	Federal Register	Date	Federal Register	Date	Federal Register
Abutilon sandwicense	E	09/28/90	55 FR 39664	10/29/91	56 FR 55770		
Adenophorus periens	E	09/14/93	58 FR 48012	11/10/94	59 FR 56333	11/07/00	65 FR 66808
						01/28/02	67 FR 3939
						03/04/02	67 FR 9806
						04/05/02	67 FR 16492
Alectryon macrococcus	E	05/24/91	56 FR 23842	05/15/92	57 FR 20772	11/07/00	65 FR 66808
						12/18/00	65 FR 79192
						12/29/00	65 FR 83158
						01/28/02	67 FR 3939
						04/03/02	67 FR 15856
						04/05/02	67 FR 16492
Alsinidendron obovatum	E	09/28/90	55 FR 39664	10/29/91	56 FR 55770		
Alsinidendron trinerve	E	09/28/90	55 FR 39664	10/29/91	56 FR 55770		

TABLE 3(b).—SUMMARY OF LISTING ACTIONS FOR 101 PLANT SPECIES FROM OAHU—Continued

Species	Federal status	Proposed rule		Final rule		Proposed critical habitat	
		Date	Federal Register	Date	Federal Register	Date	Federal Register
Bonamia menziesii	E	09/14/93	58 FR 48012	11/10/94	59 FR 56333	11/07/00 12/18/00 12/27/00 01/28/02 04/03/02 03/04/02	65 FR 66808 65 FR 79192 65 FR 82086 67 FR 3939 67 FR 15856 67 FR 9806
Cenchrus agrimonioides	E	10/02/95	60 FR 51417	10/10/96	61 FR 53108	12/18/00 04/03/02 03/04/02	65 FR 79192 67 FR 15856 67 FR 9806
Centaurium sebaeoides	E	09/28/90	55 FR 39664	10/29/91	56 FR 55770	11/07/00 12/18/00 12/27/00 12/29/00 01/28/02 04/03/02 03/04/02 04/05/02	65 FR 66808 65 FR 79192 65 FR 82086 65 FR 83158 67 FR 3939 67 FR 15856 67 FR 9806 67 FR 16492
Chamaesyce celastroides var. *kaenana*	E	09/28/90	55 FR 39664	10/29/91	56 FR 55770		
Chamaesyce deppeana	E	10/14/92	57 FR 47028	03/28/94	59 FR 14482		
Chamaesyce herbstii	E	10/02/95	55 FR 51398	10/10/96	61 FR 53089		
Chamaesyce kuwaleana	E	09/28/90	55 FR 39664	10/29/91	56 FR 55770		
Chamaesyce rockii	E	10/02/95	60 FR 51398	10/10/96	61 FR 53089		
Colubrina oppositifolia	E	12/17/92	57 FR 59951	03/04/94	59 FR 10305	12/18/00 04/03/02 05/28/02	65 FR 79192 67 FR 15856 HI PR
Ctenitis squamigera	E	06/24/93	58 FR 34231	09/26/94	59 FR 49025	12/18/00 12/27/00 01/28/02 04/03/02 03/04/02 04/05/02 05/28/02	65 FR 79192 65 FR 82086 67 FR 3939 67 FR 15856 67 FR 9806 67 FR 16492 HI PR
Cyanea acuminata	E	10/02/95	60 FR 51398	10/10/96	61 FR 53089		
Cyanea crispa	E	10/14/92	57 FR 47028	03/28/94	59 FR 14482		
Cyanea grimesiana ssp. *grimesiana*	E	10/02/95	60 FR 51417	10/10/96	61 FR 53108	12/18/00 12/27/00 12/29/00 04/03/02 03/04/02 04/05/02	65 FR 79192 65 FR 82086 65 FR 83158 67 FR 15856 67 FR 9806 67 FR 16492
Cyanea grimesiana ssp. *obatae*	E	12/14/92	57 FR 59066	06/27/94	59 FR 32932		
Cyanea humboltiana	E	10/02/95	60 FR 51398	10/10/96	61 FR 53089		
Cyanea koolauensis	E	10/02/95	60 FR 51398	10/10/96	61 FR 53089		
Cyanea longiflora	E	10/02/95	60 FR 51398	10/10/96	61 FR 53089		
Cyanea pinnatifida	E	09/28/90	55 FR 39664	10/29/91	56 FR 55770		
Cyanea st.-johnii	E	10/02/95	60 FR 51389	10/10/96	61 FR 53089		
Cyanea superba	E	07/17/90	55 FR 29072	09/11/91	56 FR 46235		
Cyanea truncata	E	10/14/92	57 FR 47028	03/28/94	59 FR 14482		
Cyperus trachysanthos	E	10/02/95	60 FR 51417	10/10/96	61 FR 53108	11/07/00 01/28/02 03/04/02	65 FR 66808 67 FR 3939 67 FR 9806
Cyrtandra crenata	E	10/14/92	57 FR 47028	03/28/94	59 FR 14482		
Cyrtandra dentata	E	10/02/95	60 FR 51398	10/10/96	61 FR 53089		
Cyrtandra polyantha	E	10/14/92	57 FR 47028	03/28/94	59 FR 14482		
Cyrtandra subumbellata	E	10/02/95	60 FR 51398	10/10/96	61 FR 53089		
Cyrtandra viridiflora	E	10/02/95	60 FR 51398	10/10/96	61 FR 53089		
Delissea subcordata	E	10/02/95	60 FR 51398	10/10/96	61 FR 53089		
Diellia erecta	E	09/14/93	58 FR 48012	11/10/94	59 FR 56333	12/18/00 12/29/00 01/28/02 04/03/02 03/04/02 04/05/02 05/28/02	65 FR 79192 65 FR 83158 67 FR 3939 67 FR 15856 67 FR 9806 67 FR 16492 HI PR
Diellia falcata	E	09/28/90	55 FR 39664	10/29/91	56 FR 55770		
Diellia unisora	E	12/14/92	57 FR 39066	06/27/94	59 FR 32932		

TABLE 3(b).—SUMMARY OF LISTING ACTIONS FOR 101 PLANT SPECIES FROM OAHU—Continued

Species	Federal status	Proposed rule		Final rule		Proposed critical habitat	
		Date	Federal Register	Date	Federal Register	Date	Federal Register
Diplazium molokaiense	E	06/24/93	58 FR 34231	09/26/94	59 FR 49025	12/18/00	65 FR 79192
						01/28/02	67 FR 3939
						04/03/02	67 FR 15856
						03/04/02	67 FR 9806
						04/05/02	67 FR 16492
Dubautia herbstobatae	E	09/28/90	55 FR 39664	10/29/91	56 FR 55770		
Eragrostis fosbergii	E	10/02/95	60 FR 51398	10/10/96	61 FR 53089		
Eugenia koolauensis	E	10/14/92	57 FR 47028	03/28/94	59 FR 14482	04/05/02	67 FR 16492
Euphorbia haeleeleana	E	10/02/95	60 FR 51417	10/10/96	61 FR 53108	11/07/00	65 FR 66808
						01/28/02	67 FR 3939
Flueggea neowawraea	E	09/14/93	58 FR 48012	11/10/94	59 FR 56333	11/07/00	65 FR 66808
						12/18/00	65 FR 79192
						01/28/02	67 FR 3939
						04/03/02	67 FR 15856
						04/05/02	67 FR 16492
						05/28/02	HI PR
Gardenia mannii	E	10/02/95	60 FR 51398	10/10/96	61 FR 53089		
Gouania meyenii	E	09/28/90	55 FR 39664	10/29/91	56 FR 55770	11/07/00	65 FR 66808
						01/28/02	67 FR 3939
Gouania vitifolia	E	12/14/92	57 FR 59066	06/27/94	59 FR 32932		
Hedyotis coriacea	E	05/24/91	56 FR 23772	05/15/92	56 FR 20772	12/18/00	65 FR 79192
						04/03/02	67 FR 15856
						05/28/02	HI PR
Hedyotis degeneri	E	09/28/90	55 FR 39664	10/29/91	56 FR 55770		
Hedyotis parvula	E	09/28/90	55 FR 39664	10/29/91	56 FR 55770		
Hesperomannia arborescens	E	10/14/92	57 FR 47028	03/28/94	59 FR 14482	12/18/00	65 FR 79192
						12/29/00	65 FR 83158
						04/03/02	67 FR 15856
						03/04/02	67 FR 9806
						04/05/02	67 FR 16492
Hesperomannia arbuscula	E	09/28/90	55 FR 39664	10/29/91	56 FR 55770	12/18/00	65 FR 79192
						04/03/02	67 FR 15856
Hibiscus brackenridgei	E	09/14/93	58 FR 48012	11/10/94	59 FR 56333	12/18/00	65 FR 79192
						12/27/00	65 FR 82086
						01/28/02	67 FR 3939
						04/03/02	67 FR 15856
						03/04/02	67 FR 9806
						04/05/02	67 FR 16492
						05/28/02	HI PR
Isodendrion laurifolium	E	10/02/95	60 FR 51417	10/10/96	61 FR 53108	11/07/00	65 FR 66808
						01/28/02	67 FR 3939
Isodendrion longifolium	E	10/02/95	60 FR 51417	10/10/96	61 FR 53108	11/07/00	65 FR 66808
						01/28/02	67 FR 3939
Isodendrion pyrifolium	T	12/17/92	57 FR 59951	03/04/94	59 FR 10305		
Labordia cyrtandrae	E	10/02/95	60 FR 51398	10/10/96	61 FR 53089		
Lepidium arbuscula	E	10/02/95	60 FR 51398	10/10/96	61 FR 53089		
Lipochaeta lobata var. *leptophylla*	E	09/28/90	55 FR 39664	10/29/91	56 FR 55770		
Lipochaeta tenuifolia	E	09/28/90	55 FR 39664	10/29/91	56 FR 55770		
Lobelia gaudichaudii ssp. *koolauensis*	E	10/02/95	60 FR 51398	10/10/96	61 FR 53089		
Lobelia monostachya	E	10/02/95	60 FR 51398	10/10/96	61 FR 53089		
Lobelia niihauensis	E	09/28/90	55 FR 39664	10/29/91	56 FR 55770	11/07/00	65 FR 66808
						01/28/02	67 FR 3939
Lobelia oahuensis	E	10/14/92	57 FR 47028	03/28/94	59 FR 14482		
Lysimachia filifolia	E	10/30/91	56 FR 55862	02/25/94	59 FR 09304	11/07/00	65 FR 66808
						01/28/02	67 FR 3939
Mariscus pennatiformis	E	09/14/93	58 FR 58012	11/10/94	59 FR 56333	12/18/00	65 FR 79192
						01/28/02	67 FR 3939
						04/03/02	67 FR 15856
						05/14/02	67 FR 34522
						05/28/02	HI PR
Marsilea villosa	E	02/15/91	56 FR 6349	06/22/92	57 FR 27863	12/29/00	65 FR 83158
						04/05/02	67 FR 16492
Melicope lydgatei	E	10/14/92	57 FR 47028	03/28/94	59 FR 14482		
Melicope pallida	E	10/30/91	56 FR 55862	2/25/94	59 FR 09304	11/07/00	65 FR 66808
						01/28/02	67 FR 3939
Melicope saint-johnii	E	10/02/95	60 FR 51398	10/10/96	61 FR 53089		
Myrsine juddii	E	10/02/95	60 FR 51398	10/10/96	61 FR 53089		
Neraudia angulata	E	9/28/90	55 FR 39664	10/29/91	56 FR 55770		
Nototrichium humile	E	9/28/90	55 FR 39664	10/29/91	56 FR 55770		

TABLE 3(b).—SUMMARY OF LISTING ACTIONS FOR 101 PLANT SPECIES FROM OAHU—Continued

Species	Federal status	Proposed rule		Final rule		Proposed critical habitat	
		Date	Federal Register	Date	Federal Register	Date	Federal Register
Peucedanum sandwicense	E	10/30/91	56 FR 55862	02/25/94	59 FR 09304	11/07/00	65 FR 66808
						12/18/00	65 FR 79192
						12/29/00	65 FR 83158
						01/28/02	67 FR 3939
						04/03/02	67 FR 15856
						04/05/02	67 FR 16492
Phlegmariurus nutans	E	10/14/92	57 FR 47028	03/28/94	59 FR 14482		
Phyllostegia hirsuta	T	10/02/95	60 FR 51398	10/10/96	61 FR 53089		
Phyllostegia kaalaensis	E	10/02/95	60 FR 51398	10/10/96	61 FR 53089		
Phyllostegia mollis	E	09/28/90	55 FR 39664	10/29/91	56 FR 55770	12/18/00	65 FR 79192
						04/03/02	67 FR 15856
						04/05/02	67 FR 16492
Phyllostegia parviflora	E	10/02/95	60 FR 51417	10/10/96	61 FR 53108		
Plantago princeps	E	09/14/93	58 FR 48012	11/10/94	59 FR 56333	11/07/00	65 FR 66808
						12/18/00	65 FR 79192
						01/28/02	67 FR 3939
						04/03/02	67 FR 15856
						04/05/02	67 FR 16492
Platanthera holochila	E	10/02/95	60 FR 51417	10/10/96	61 FR 53108	11/07/00	65 FR 66808
						12/18/00	65 FR 79192
						12/29/00	65 FR 83158
						01/28/00	67 FR 3939
						04/03/02	67 FR 15856
						04/05/02	67 FR 16492
Pritichardia kaalae	E	10/02/95	60 FR 51398	10/10/96	61 FR 53089		
Pteris lidgatei	E	06/24/93	58 FR 34231	09/26/94	59 FR 49025	12/18/00	65 FR 79192
						04/03/02	67 FR 15856
						04/05/02	67 FR 16492
Sanicula mariversa	E	09/28/90	55 FR 39664	10/29/91	56 FR 55770		
Sanicula purpurea	E	10/02/95	60 FR 51417	10/10/96	61 FR 53108	12/18/00	65 FR 79192
						04/03/02	67 FR 15856
Schiedea hookeri	E	10/02/95	60 FR 51417	10/10/96	61 FR 53108		
Schiedea kaalae	E	09/28/90	55 FR 39664	10/29/91	56 FR 55770		
Schiedea kealiae	E	10/02/95	60 FR 51398	10/10/96	61 FR 53089		
Schiedea nuttallii	E	10/02/95	60 FR 51417	10/10/96	61 FR 53108	11/07/00	65 FR 66808
						12/29/00	65 FR 83158
						04/05/02	67 FR 16492
Sesbania tomentosa	E	09/14/93	58 FR 48012	11/10/94	59 FR 56333	11/07/00	65 FR 66808
						12/18/00	65 FR 79192
						12/29/00	65 FR 83158
						01/28/02	67 FR 3939
						04/03/02	67 FR 15856
						03/04/02	67 FR 9806
						04/05/02	67 FR 16492
						05/14/02	67 FR 34522
						05/28/02	HI PR
Silene lanceolata	E	09/20/91	56 FR 47718	10/08/92	57 FR 46325	12/29/00	65 FR 83158
						01/28/02	67 FR 3939
						04/05/02	67 FR 16492
						05/28/02	HI PR
Silene perlmanii	E	09/28/90	55 FR 39664	10/29/91	56 FR 55770		
Solanum sandwicense	E	10/30/91	56 FR 55862	02/25/94	59 FR 09304	11/07/00	65 FR 66808
						01/28/02	67 FR 3939
Spermolepis hawaiiensis	E	09/14/93	58 FR 48012	11/10/94	59 FR 56333	11/07/00	65 FR 66808
						12/18/00	65 FR 79192
						12/27/00	65 FR 82086
						12/29/00	65 FR 83158
						01/28/02	67 FR 3939
						04/03/02	67 FR 15856
						03/04/02	67 FR 9806
						04/05/02	67 FR 16492
						05/28/02	HI PR
Stenogyne kanehoana	E	01/23/91	56 FR 2493	05/13/92	57 FR 20592		
Tetramolopium filiforme	E	09/28/90	55 FR 39664	10/29/91	56 FR 55770		
Tetramolopium lepidotum ssp. *lepidotum*	E	09/28/90	55 FR 39664	10/29/91	56 FR 55770		
Tetraplasandra gymnocarpa	E	10/14/92	57 FR 47028	03/28/94	59 FR 14482		
Trematalobelia singularis	E	10/02/95	60 FR 51398	10/10/96	61 FR 53089		
Urera kaalae	E	09/28/90	55 FR 39664	10/29/91	56 FR 55770		

TABLE 3(b).—SUMMARY OF LISTING ACTIONS FOR 101 PLANT SPECIES FROM OAHU—Continued

Species	Federal status	Proposed rule		Final rule		Proposed critical habitat	
		Date	Federal Register	Date	Federal Register	Date	Federal Register
Vigna o-wahuensis	E	09/14/93	58 FR 48012	11/10/94	59 FR 56333	12/18/00 12/29/00 01/28/02 04/03/02 03/04/02 04/05/02 05/28/02	65 FR 79192 65 FR 83158 67 FR 3939 67 FR 15856 67 FR 9806 67 FR 16492 HI PR
Viola chamissoniana ssp. *chamissoniana*	E	09/28/90	55 FR 39664	10/29/91	56 FR 55770		
Viola oahuensis	E	10/02/95	60 FR 51398	10/10/96	61 FR 53089		

Key: E = Endangered.
T = Threatened.

Critical Habitat

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 will find that critical habitat designation 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.

The not prudent determinations for these species, along with others, were challenged in *Conservation Council for Hawaii* v. *Babbitt,* 2 F. Supp. 2d 1280 (D. Haw. 1998). 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 101 species reported from Oahu. 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 (*id.* at 1283–85).

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, State, and local governments of the listing and of the areas that are essential to the species' conservation, the court found that there may be Federal activity on private property in the future, even though no such activity may be occurring there at the present (*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).

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 more than 100 responses from individuals, non-profit organizations, the Division of Forestry and Wildlife (DOFAW), county governments, 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 some of the respondents expressed support for the designation of critical habitat for 245 Hawaiian plants, more than 80 percent opposed the designation of critical habitat for these plants. In general, these respondents opposed designation because they believed it will cause economic hardship, discourage cooperative projects, polarize relationships with hunters, or potentially increase trespass or vandalism on private lands. In addition, commenters also cited a lack of information on the biological and ecological needs of these plants which, they suggested, may lead to designation based on guesswork. 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 November 7, 2000, we published the first of the court-ordered prudency determinations and proposed critical habitat designations or non-designations for 76 Kauai and Niihau plants (65 FR 66808). The prudency determinations and proposed critical habitat designations for Maui and Kahoolawe plants were published December 18, 2000 (65 FR 79192), for Lanai plants on December 27, 2000 (65 FR 82086), and for Molokai plants on December 29, 2000 (65 FR 83157). All of these proposed rules had been sent to the **Federal Register** on or by November 30, 2000, as required by the court's order. In those proposals, we determined that critical habitat was prudent for 45

species (*Adenophorus periens, Alectryon macrococcus, Bonamia menziesii, Cenchrus agrimonioides, Centaurium sebaeoides, Colubrina oppositifolia, Ctenitis squamigera, Cyanea grimesiana* ssp. *grimesiana, Cyperus trachysanthos, Diellia erecta, Diplazium molokaiense, Eugenia koolauensis, Euphorbia haeleeleana, Flueggea neowawraea, Gouania meyenii, Gouania vitifolia, Hedyotis coriacea, Hesperomannia arborescens, Hesperomannia arbuscula, Hibiscus brackenridgei, Isodendrion laurifolium, Isodendrion longifolium, Isodendrion pyrifolium, Lobelia niihauensis, Lysimachia filifolia, Mariscus pennatiformis, Marsilea villosa, Melicope pallida, Nototrichium humile, Peucedanum sandwicense, Phlegmariurus nutans, Phyllostegia mollis, Phyllostegia parviflora, Plantago princeps, Platanthera holochila, Pteris lidgatei, Sanicula purpurea, Schiedea hookeri, Schiedea nuttallii, Sesbania tomentosa, Silene lanceolata, Solanum sandwicense, Spermolepis hawaiiensis, Tetramolopium lepidotum* ssp. *lepidotum,* and *Vigna o-wahuensis*) that are reported from Oahu as well as on Kauai, Niihau, Maui, Kahoolawe, Lanai, or Molokai.

On October 3, 2001, we submitted a joint stipulation with Earth Justice Legal Defense Fund requesting extension of the court order for the final rules to designate critical habitat for plants from Kauai and Niihau (July 30, 2002), Maui and Kahoolawe (August 23, 2002), Lanai (September 16, 2002), and Molokai (October 16, 2002), citing the need to revise the proposals to incorporate or address new information and comments received during the comment periods. The joint stipulation was approved and ordered by the court on October 5, 2001. In the revised proposed rules published on January 28, 2002 (67 FR 3939), March 4, 2002 (67 FR 9806), April 3, 2002 (67 FR 15856), and April 5, 2002 (67 FR 16492), we proposed that designation of critical habitat was prudent for *Eugenia koolauensis, Gouania vitifolia, Isodendrion pyrifolium, Nototrichium humile, Phlegmariurus nutans, Phyllostegia parviflora, Schiedea hookeri, and Tetramolopium lepidotum* ssp. *lepidotum,* eight species reported from Oahu as well as Kauai, Maui, Molokai, and Lanai. The designation of critical habitat is proposed for all of these species on Oahu.

On May 14, 2002, we published the prudency determinations and proposed critical habitat designations for the Northwestern Hawaiian Islands plants (67 FR 34522) and in this issue of the **Federal Register** we are publishing the prudency determinations and proposed critical habitat designations for the Hawaii Island plants. Publication of this proposal for plants from Oahu is consistent with the August 10, 1998, court order.

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 or a threatened species to the point at which listing under the Act is no longer necessary.

Critical habitat receives protection under section 7 of the Act through the prohibition against destruction or adverse modification of critical habitat 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 destruction or adverse modification of proposed critical habitat. Aside from the added protection that may be provided under section 7, the Act does not provide other forms of protection to lands designated as critical habitat. Because consultation under section 7 of the Act does not apply to activities on private or other non-Federal lands that do not involve a Federal nexus, critical habitat designation would not afford any additional regulatory protections under the Act.

Critical habitat also provides non-regulatory benefits to the species by informing the public and private sectors of areas that are important for species recovery and where conservation actions would be most effective. 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 the conservation of that species, and can alert the public as well as land-managing agencies to the importance of those areas. Critical habitat also identifies areas that may require special management considerations or protection, and may help provide protection to areas where significant threats to the species have been identified to help to avoid accidental damage to such areas.

In order to be included in a critical habitat designation, the habitat must be ''essential to the conservation of the species.'' Critical habitat designations identify, to the extent known and using the best scientific and commercial data available, habitat areas that provide at least one of the physical or biological features essential to the conservation of the species (primary constituent elements, as defined at 50 CFR 424.12(b)). Section 3(5)(C) of the Act states that not all areas that can be occupied by a species should be designated as critical habitat unless the Secretary determines that such areas are essential to the conservation of the species. Our regulations (50 CFR 424.12(e)) also state that, ''The Secretary shall designate as critical habitat areas outside the geographic area presently occupied by the species only when a designation limited to its present range would be inadequate to ensure the conservation of the species.''

Section 4(b)(2) of the Act requires that we take 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.

Our Policy on Information Standards Under the Endangered Species Act, published on July 1, 1994 (59 FR 34271), provides criteria, establishes procedures, and provides guidance to ensure that our decisions represent the best scientific and commercial data available. It requires that our biologists, to the extent consistent with the Act and with the use of the best scientific and commercial data available, use primary and original sources of information as the basis for recommendations to designate critical habitat. When determining which areas are critical habitat, a primary source of information should be the listing rule for the species. Additional information may be obtained from a recovery plan, articles in peer-reviewed journals, conservation plans developed by States and counties, scientific status surveys and studies, and biological assessments or other unpublished materials.

Section 4 of the Act requires that we designate critical habitat based on what we know at the time of designation. Habitat is often dynamic, and species may move from one area to another over time. Furthermore, we recognize that designation of critical habitat may not

include all of the habitat areas that may eventually be determined to be necessary for the recovery of the species. For these reasons, critical habitat designations do not signal that habitat outside the designation is unimportant or may not be required for recovery. Areas outside the critical habitat designation will continue to be subject to conservation actions that may be implemented under section 7(a)(1) of the Act and to the regulatory protections afforded by the section 7(a)(2) jeopardy standard and the section 9 prohibitions, as determined on the basis of the best available information at the time of the action. Federally funded or assisted projects affecting listed species outside their designated critical habitat areas may still result in jeopardy findings in some cases. Similarly, critical habitat designations made on the basis of the best available information at the time of designation will not control the direction and substance of future recovery plans, habitat conservation plans (HCPs), or other species conservation planning efforts if new information available to these planning efforts calls for a different outcome.

A. Prudency Redeterminations

In other proposals (65 FR 66808, 65 FR 79192, 65 FR 82086, 65 FR 83158, 67 FR 3939, 67 FR 9806, 67 FR 15856, 67 FR 16492), we proposed that designation of critical habitat was prudent for 45 plants that are reported from Oahu as well as from Kauai, Niihau, Lanai, Maui, Kahoolawe, and Molokai. These 45 species are: *Adenophorus periens, Alectryon macrococcus, Bonamia menziesii, Cenchrus agrimonioides, Centaurium sebaeoidea, Colubrina oppositifolia, Ctenitis squamigera, Cyanea grimesiana* ssp. *grimesiana, Cyperus trachysanthos, Diellia erecta, Diplazium molokaiense, Eugenia koolauensis, Euphorbia haeleeleana, Flueggea neowawraea, Gouania meyenii, Gouania vitifolia, Hedyotis coriacea, Hesperomannia arborescens, Hesperomannia arbuscula, Hibiscus brackenridgei, Isodendrion laurifolium, Isodendrion longifolium, Isodendrion pyrifolium, Lobelia niihauensis, Lysimachia filifolia, Mariscus pennatiformis, Marsilea villosa, Melicope pallida, Nototrichium humile, Peucedanum sandwicense, Phlegmariurus nutans, Phyllostegia mollis, Phyllostegia parviflora, Plantago princeps, Platanthera holochila, Pteris lidgatei, Sanicula purpurea, Schiedea hookeri, Schiedea nuttallii, Sesbania tomentosa, Silene lanceolata, Solanum sandwicense, Spermolepis hawaiiensis, Tetramolopium lepidotum* ssp. *lepidotum,* and *Vigna o-wahuensis.*

To determine whether critical habitat would be prudent for each of the 56 species for which a prudency determination has not been made previously, we analyzed the potential threats and benefits for each species in accordance with the court's order. These 56 plants were listed as endangered species under the 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. We examined the evidence currently available for each of these species and found specific evidence of vandalism, disturbance, and/or the threat of unrestricted collection for one species of *Pritchardia,* the native palm. At the time of listing, we determined that designation of critical habitat was not prudent for *Pritchardia kaalae* because it would increase the degree of threat from vandalism or collecting, and would provide no benefit (61 FR 53108). Recently, we received information on the commercial trade in palms conducted through the internet (Grant Canterbury, Service, *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 kaalae.* In light of this information, we believe that designation of critical habitat would likely increase the threat from vandalism or collection to this species of *Pritchardia* on the island of Oahu. 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). We believe that the evidence shows that these species of palm may be attractive to such collectors. The final listing rule for this species contained only general information on its distribution, but the publication of precise maps and descriptions of critical habitat in the **Federal Register** would make this species more vulnerable to incidents of vandalism or collection, and, therefore, contribute to the decline of these species and make recovery more difficult.

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 *Pritchardia kaalae,* we believe that the benefits of designating critical habitat do not outweigh the potential increased threats from vandalism or collection. Given the above considerations, we propose that designation of critical habitat for *Pritchardia kaalae* is not prudent.

One species, *Cyrtandra crenata,* endemic to the island of Oahu, is no longer extant in the wild. *Cyrtandra crenata* was last collected in 1932 from Waikane Valley (HINHP Database 2001). In addition, this species is not known to be in storage or under propagation. Under these circumstances, we propose that designation of critical habitat for *Cyrtandra crenata* is not prudent because such designation would be of no benefit to this species. If this 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)).

We examined the evidence available for the other 54 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 54 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 or the occupancy is in question; (2) focusing conservation activities on the most essential areas; (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 54 plant species there would be some benefit 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. Thirty-nine of these species are reported from federally owned lands or lands under Federal jurisdiction (*Abutilon sandwicense, Alsinidendron obovatum, Alsinidendron trinerve, Chamaesyce celastroides* var. *kaenana, Chamaesyce kuwaleana, Chamaesyce rockii, Cyanea acuminata, Cyanea*

crispa, Cyanea grimesiana ssp. *obatae, Cyanea humboldtiana, Cyanea koolauensis, Cyanea st.-johnii, Cyanea superba, Cyrtandra dentata, Cyrtandra subumbellata, Cyrtandra viridiflora, Delissea subcordata, Diellia falcata, Dubautia herbstobatae, Eragrostis fosbergii, Gardenia mannii, Hedyotis degeneri, Hedyotis parvula, Lipochaeta lobata* var. *leptophylla, Lipochaeta tenuifolia, Lobelia gaudichaudii* ssp. *koolauensis, Lobelia oahuensis, Melicope lydgatei, Melicope saint-johnii, Myrsine juddii, Neraudia angulata, Phyllostegia hirsuta, Sanicula mariversa, Schiedea kealiae, Tetramolopium filiforme, Tetraplasandra gymnocarpa, Urera kaalae, Viola chamissoniana* ssp. *chamissoniana,* and *Viola oahuensis*) (see Table 2), where most actions would be subject to section 7. While some of the species 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 be unlikely to 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 may also be some educational or informational benefits to the designation of critical habitat. Educational benefits include the notification of landowner(s), 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, particularly for *Cyanea pinnatifida* and *Silene perlmanii,* two species currently only in propagation. Therefore, we propose that designation of critical habitat is prudent for 54 plant species: *Abutilon sandwicense, Alsinidendron obovatum, Alsinidendron trinerve, Chamaesyce celastroides* var. *kaenana, Chamaesyce deppeana, Chamaesyce herbstii, Chamaesyce kuwaleana, Chamaesyce rockii, Cyanea acuminata, Cyanea crispa, Cyanea grimesiana* ssp. *obatae, Cyanea humboldtiana, Cyanea koolauensis, Cyanea longiflora, Cyanea pinnatifida, Cyanea st.-johinii, Cyanea superba, Cyanea truncata, Cyrtandra dentata, Cyrtandra polyantha, Cyrtandra subumbellata, Cyrtandra viridiflora, Delissea subcordata, Diellia falcata, Diellia unisora, Dubautia herbstobatae, Eragrostis fosbergii, Gardenia mannii, Hedyotis degeneri, Hedyotis parvula, Labordia cyrtandrae, Lepidium arbuscula, Lipochaeta lobata* var. *leptophylla, Lipochaeta tenuifolia, Lobelia gaudichaudii* ssp. *koolauensis, Lobelia monostachya, Lobelia oahuensis, Melicope lydgatei, Melicope saint-johnii, Myrsine juddii, Neraudia angulata, Phyllostegia hirsuta, Phyllostegia kaalaensis, Sanicula mariversa, Schiedea kaalae, Schiedea kealiae, Silene perlmanii, Stenogyne kanehoana, Tetramolopium filiforme, Tetraplasandra gymnocarpa, Trematalobelia singularis, Urera kaalae, Viola chamissoniana* ssp. *chamissoniana,* and *Viola oahuensis.*

B. Methods

As required by the Act (section 4(b)(2)) and regulations at 50 CFR 424.12, we used the best scientific data available to determine areas that are essential to conserve *Abutilon sandwicense, Adenophorus periens, Alectryon macrococcus, Alsinidendron obovatum, Alsinidendron trinerve, Bonamia menziesii, Cenchrus agrimonioides, Centaurium sebaeoides, Chamaesyce celastroides* var. *kaenana, Chamaesyce deppeana, Chamaesyce herbstii, Chamaesyce kuwaleana, Chamaesyce rockii, Colubrina oppositifolia, Ctenitis squamigera, Cyanea acuminata, Cyanea crispa, Cyanea grimesiana* ssp. *grimesiana, Cyanea grimesiana* ssp. *obatae, Cyanea humboltiana, Cyanea koolauensis, Cyanea longiflora, Cyanea pinnatifida, Cyanea st.-johnii, Cyanea superba, Cyanea truncata, Cyperus trachysanthos, Cyrtandra dentata, Cyrtandra polyantha, Cyrtandra subumbellata, Cyrtandra viridiflora, Delissea subcordata, Diellia erecta, Diellia falcata, Diellia unisora, Diplazium molokaiense, Dubautia herbstobatae, Eragrostis fosbergii, Eugenia koolauensis, Euphorbia haeleeleana, Flueggea neowawraea, Gardenia mannii, Gouania meyenii, Gouania vitifolia, Hedyotis coriacea, Hedyotis degeneri, Hedyotis parvula, Hesperomannia arborescens, Hesperomannia arbuscula, Hibiscus brackenridgei, Isodendrion laurifolium, Isodendrion longifolium, Isodendrion pyrifolium, Labordia cyrtandrae, Lepidium arbuscula, Lipochaeta lobata* var. *leptophylla, Lipochaeta tenuifolia, Lobelia gaudichaudii* ssp. *koolauensis, Lobelia monostachya, Lobelia niihauensis, Lobelia oahuensis, Lysimachia filifolia, Mariscus pennatiformis, Marsilea villosa, Melicope pallida, Melicope saint-johnii, Myrsine juddii, Neraudia angulata, Nototrichium humile, Pelea lydgatei, Peucedanum sandwicense, Phlegmariurus nutans, Phyllostegia hirsuta, Phyllostegia kaalaensis, Phyllostegia mollis, Phyllostegia parviflora, Plantago princeps, Platanthera holochila, Pteris lidgatei, Sanicula mariversa, Sanicula purpurea, Schiedea hookeri, Schiedea kaalae, Schiedea kealiae, Schiedea nuttallii, Sesbania tomentosa, Silene lanceolata, Silene perlmanii, Solanum sandwicense, Spermolepis hawaiiensis, Stenogyne kanehoana, Tetramolopium filiforme, Tetramolopium lepidotum* ssp. *lepidotum, Tetraplasandra gymnocarpa, Trematalobelia singularis, Urera kaalae, Vigna o-wahuensis, Viola chamissoniana* ssp. *chamissoniana,* and *Viola oahuensis.* This information included the known locations, site-specific species information from the HINHP database and our own 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; island-wide Geographic Information System (GIS) coverages, (*e.g.* vegetation, soils, annual rainfall, elevation contours, land ownership); the final listing rules for these 99 species; recent biological surveys and reports; our recovery plans for these 99 species; discussions with botanical experts; and recommendations from the Hawaii Pacific Plants Recovery Coordinating Committee (HPPRCC) (see also the discussion below) (Service 1994, 1995a, 1995b, 1996a, 1996b, 1996c, 1996d, 1997, 1998a, 1998b, 1999; HPPRCC 1998; HINHP Database 2000, CPC *in litt.* 1999; J. Lau *et al.,* pers. comm., 2001).

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

The HPPRCC identified essential habitat areas for all listed, proposed, and candidate plants and evaluated species of concern to determine if essential habitat areas would provide for their habitat needs. However, the HPPRCC's mapping of habitat is distinct from the regulatory designation of critical habitat as defined by the Act. More data has been collected since the recommendations made by the HPPRCC

in 1998. Much of the area that was identified by the HPPRCC as inadequately surveyed has now been surveyed in some way. New location data for many species has been gathered. Also, the HPPRCC identified areas as essential based on species clusters (areas that included listed species as well as candidate species, and species of concern) while we have only delineated areas that are essential for the conservation of the 99 listed species at issue. As a result, the proposed critical habitat designations in this proposed rule include not only some habitat that was identified as essential in the 1998 recommendation but also habitat that was not identified as essential in those recommendations.

C. Primary Constituent Elements

In accordance with section 3(5)(A)(i) 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 (primary consistent elements) 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.

In previous proposals (65 FR 66808, 65 FR 79192, 65 FR 82086, 65 FR 83158, 67 FR 3939, 67 FR 9806, 67 FR 15856, 67 FR 16492), we determined that designation of critical habitat was prudent for 45 plants (*Adenophorus periens, Alectryon macrococcus, Bonamia menziesii, Cenchrus agrimonioides, Centaurium sebaeoides, Colubrina oppositifolia, Ctenitis squamigera, Cyanea grimesiana* ssp. *grimesiana, Cyperus trachysanthos, Diellia erecta, Diplazium molokaiense, Eugenia koolauensis, Euphorbia haeleeleana, Flueggea neowawraea, Gouania meyenii, Gouania vitifolia, Hedyotis coriacea, Hesperomannia arborescens, Hesperomannia arbuscula, Hibiscus brackenridgei, Isodendrion laurifolium, Isodendrion longifolium, Isodendrion pyrifolium, Lobelia niihauensis, Lysimachia filifolia, Mariscus pennatiformis, Marsilea villosa, Melicope pallida, Nototrichium humile, Peucedanum sandwicense, Phlegmariurus nutans, Phyllostegia mollis, Phyllostegia parviflora, Plantago princeps, Platanthera holochila, Pteris lidgatei, Sanicula purpurea, Schiedea hookeri, Schiedea nuttallii, Sesbania tomentosa, Silene lanceolata, Solanum sandwicense, Spermolepis hawaiiensis, Tetramolopium lepidotum* ssp. *lepidotum,* and *Vigna o-wahuensis*) that are reported from Oahu as well as from Kauai, Niihau, Maui, Kahoolawe, Lanai, and/or Molokai.

In this proposal, we have determined that designation of critical habitat is prudent for 54 plants (*Abutilon sandwicense, Alsinidendron obovatum, Alsinidendron trinerve, Chamaesyce celastroides* var. *kaenana, Chamaesyce deppeana, Chamaesyce herbstii, Chamaesyce kuwaleana, Chamaesyce rockii, Cyanea acuminata, Cyanea crispa, Cyanea grimesiana* ssp. *obatae, Cyanea humboltiana, Cyanea koolauensis, Cyanea longiflora, Cyanea pinnatifida, Cyanea st.-johnii, Cyanea superba, Cyanea truncata, Cyrtandra dentata, Cyrtandra polyantha, Cyrtandra subumbellata, Cyrtandra viridiflora, Delissea subcordata, Diellia falcata, Diellia unisora, Dubautia herbstobatae, Eragrostis fosbergii, Gardenia mannii, Hedyotis degeneri, Hedyotis parvula, Labordia cyrtandrae, Lepidium arbuscula, Lipochaeta lobata* var. *leptophylla, Lipochaeta tenuifolia, Lobelia gaudichaudii* ssp. *koolauensis, Lobelia monostachya, Lobelia oahuensis, Melicope lydgatei, Melicope saint-johnii, Myrsine juddii, Neraudia angulata, Phyllostegia hirsuta, Phyllostegia kaalaensis, Sanicula mariversa, Schiedea kaalae, Schiedea kealiae, Silene perlmanii, Stenogyne kanehoana, Tetramolopium filiforme, Tetraplasandra gymnocarpa, Trematalobelia singularis, Urera kaalae, Viola chamissoniana* ssp. *chamissoniana,* and *Viola oahuensis*) reported only from Oahu.

Ten of the 99 species (*Adenophorus periens, Cyanea pinnatifida, Diplazium molokaiense, Hedyotis coriacea, Isodendrion pyrifolium, Mariscus pennatiformis, Platanthera holochila, Silene perlmanii, Solanum sandwicense,* and *Vigna o-wahuensis*) no longer occur on Oahu. Eight of these species (*Adenophorus periens, Diplazium molokaiense, Hedyotis coriacea, Isodendrion pyrifolium, Mariscus pennatiformis, Platanthera holochila, Solanum sandwicense,* and *Vigna o-wahuensis*) occur on one or more other Hawaiian Islands. *Cyanea pinnatifida* and *Silene perlmanii* are currently extant only in propagation. Based on the information available at this time, we have identified the physical and biological features that are considered essential to the conservation of all ten species on Oahu. Therefore, we were able to identify the specific areas outside the geographic areas occupied by these species at the time of their listing (unoccupied habitat) that are essential for the conservation of *Adenophorus periens, Cyanea pinnatifida, Diplazium molokaiense, Hedyotis coriacea, Isodendrion pyrifolium, Mariscus pennatiformis, Platanthera holochila, Silene perlmanii, Solanum sandwicense,* and *Vigna o-wahuensis.*

All areas proposed as critical habitat are within the historical range of one or more of the 99 species at issue and contain one or more of the physical or biological features (primary constituent elements) essential for the conservation of one or more of the species.

As described in the discussions for each of the 99 species for which we are proposing critical habitat, we are proposing to define the primary constituent elements on the basis of the habitat features of the areas in which the plant species are reported from, as described by the type of plant community, associated native plant species, locale information (*e.g.,* steep rocky cliffs, talus slopes, stream banks), and elevation. The habitat features provide the ecological components required by the plant. The type of plant community and associated native plant species indicates specific microclimate conditions, retention and availability of water in the soil, soil microorganism community, and nutrient cycling and availability. The locale provides information on soil type, elevation, rainfall regime, and temperature. Elevation indicates information on daily and seasonal temperature and sun intensity. Therefore, the descriptions of the physical elements of the locations of each of these species, including habitat type, plant communities associated with the species, location, and elevation, as described in the *Supplementary Information-Discussion of the Plant Taxa* section above, constitute the primary constituent elements for these species on Oahu.

D. Criteria Used To Identify Critical Habitat

Based on the comments received during the public comment periods following publication of the four proposals to designate critical habitat for Hawaiian plants on Kauai and Niihau (65 FR 66808), Maui and Kahoolawe (65 FR 79192), Lanai (65 FR 82086), and Molokai (65 FR 83158), we have reevaluated the manner in which

we delineated proposed critical habitat. In addition, we met with members of the HPPRCC, and State and Federal agencies to discuss criteria and methods to delineate critical habitat units for these Hawaiian plants.

The lack of detailed scientific data on the life history of these plant species makes it impossible for us to develop a robust quantitative model (e.g., population viability analysis) to identify the optimal number, size, and location of critical habitat units to achieve recovery (Beissinger and Westphal 1998; Burgman *et al.* 2001; Ginzburg *et al.* 1990; Karieva and Wennergren 1995; Menges 1990; Murphy *et al.* 1990; Taylor 1995). At this time, and consistent with the listing of these species and their recovery plans, the best available information leads us to conclude that the current size and distribution of the extant populations are not sufficient to expect a reasonable probability of long-term survival and recovery of these plant species. Therefore, we used the best available information, including expert scientific opinion to identify potentially suitable habitat within the known historic range of each species.

We considered several factors in the selection and proposal of specific boundaries for critical habitat for these 99 species. For each of these species, the overall recovery strategy outlined in the approved recovery plans includes the following components: (1) Stabilization of existing wild populations, (2) protection and management of habitat, (3) enhancement of existing small populations and reestablishment of new populations within historic range, and (4) research on species' biology and ecology (Service 1994, 1995a, 1995b, 1996a, 1996b, 1996c, 1996d, 1997, 1998a, 1998b, 1999). Thus, the long-term recovery of these species is dependent upon the protection of existing population sites and potentially suitable unoccupied habitat within historic range.

The overall recovery goal stated in the recovery plans for each of these species includes the establishment of 8 to 10 populations with a minimum of 100 mature individuals per population for long-lived perennials, 300 mature individuals per population for short-lived perennials, and 500 mature individuals per population for annuals. There are some specific exceptions to this general recovery goal of 8 to10 populations for multi-island species (see discussion below on *Marsilea villosa*) and for species that are believed to be very narrowly distributed on a single island, and the proposed critical habitat designations reflect this exception for these species. To be considered recovered, each population of a species endemic to the island of Oahu should occur on the island to which it is endemic, and likewise the populations of a multi-island species should be distributed among the islands of its known historic range (Service 1994, 1995a, 1995b, 1996a, 1996b, 1996c, 1996d, 1997, 1998a, 1998b, 1999). A population, for the purposes of this discussion and as defined in the recovery plans for these species, is a unit in which the individuals could be regularly cross-pollinated, and influenced by the same small-scale events (such as landslides), and containing 100, 300, or 500 mature individuals, depending on whether the species is a long-lived perennial, short-lived perennial, or annual.

Marsilea villosa, a short-lived perennial aquatic fern, was historically known from six populations on three different islands, Molokai, Oahu, and Niihau. This species is now extant only on Oahu and Molokai. Delisting objectives for this species include protection and stabilization of at least six (rather than 8 to 10) geographically distinct, self-sustaining populations (either three on Oahu and three on Molokai or three on Oahu, two on Molokai, and one on Niihau), stable or increasing population sizes, no active management needed, and self-maintenance of each population through two successive floods resulting in sexual reproduction. Delisting objectives for *Marsilea villosa* do not include a specific number of mature individuals per population because of its clonal nature (it is extemely difficult to distinguish between individuals in clonal plant species) (Service 1996c).

By adopting the specific recovery objectives enumerated above, the adverse effects of genetic inbreeding and random environmental events and catastrophes, such as landslides, hurricanes, or tsunamis that could destroy a large percentage of the species at any one time may be reduced (Menges 1990; Podolsky 2001). These recovery objectives were initially developed by the HPPRCC and are found in all of the recovery plans for these species. While they are expected to be further refined as more information on the population biology of each species becomes available, the justification for these objectives is found in the current conservation biology literature addressing the coonservation of rare and endangered plants and animals (Beissinger and Westphal 1998; Burgman *et al.* 2001; Falk et al. 1996; Ginzburg *et al.* 1990; Hendrix and Kyhl 2000; Karieva and Wennergren 1995; Luijten *et al.* 2000; Meffe and Carroll 1997; Menges 1990; Murphy *et al.* 1990; Quintana-Ascencio and Menges 1996; Taylor 1995; Tear *et al.* 1995; Wolf and Harrison 2001). The overall goal of recovery in the short-term is a successful population that can carry on basic life-history processes, such as establishment, reproduction, and dispersal, at a level where the probability of extinction is low. In the long-term, the species and its populations should be at a reduced risk of extinction and be adaptable to environmental change through evolution and migration.

The long-term objectives, as reviewed by Pavlik, range from 50 to 2,500 individuals per population, based largely on research and theoretical modeling on endangered animals. Many aspects of species life history are typically considered to determine guidelines for species interim stability and recovery, including longevity, breeding system, growth form, fecundity, ramet (a plant that is an independent member of a clone) production, survivorship, seed duration, environmental variation, and successional stage of the habitat. Hawaiian species are poorly studied, and the only one of the afore-mentioned characteristics that can be uniformly applied to all Hawaiian plant species is longevity (*i.e.*, long-lived perennial, short-lived perennial, and annual). In general, long-lived woody perennial species would be expected to be viable at population levels of 50 to 250 individuals per population, while short-lived perennial species would be viable at population levels of 1,500 to 2,500 individuals or more per population. These population numbers were refined for Hawaiian plant species by the HPPRCC (1994) due to the restricted distribution of suitable habitat typical of Hawaiian plants and the likelihood of smaller genetic diversity of several species that evolved from one single introduction. For recovery of Hawaiian plants, the HPPRCC recommended a general recovery guideline of 100 mature individuals per population for long-lived perennial species, 300 mature individuals per population for short-lived perennial species, and 500 mature individuals per population for annual species.

The HPPRCC also recommended the conservation and establishment of 8 to10 populations to address the numerous risks to the long-term survival and conservation of Hawaiian plant species. Although absent the detailed information inherent to the types of PVA models described above (Burgman *et al.* 2001), this approach nevertheless

employs two widely recognized and scientifically accepted goals for promoting viable populations of listed species: (1) Creation or maintenance of multiple populations so that a single or series of catastrophic events cannot destroy the whole listed species (Luijten *et al.* 2000; Menges 1990; Quintana-Ascencio and Menges 1996); and (2) increasing the size of each population in the respective critical habitat units to a level where the threats of genetic, demographic, and normal environmental uncertainties are diminished (Hendrix and Kyhl 2000; Luijten et al. 2000; Meffe and Carroll 1997; Service 1997; Tear *et al.* 1995; Wolf and Harrison 2001). In general, the larger the number of populations and the larger the size of each population, the lower the probability of extinction (Raup 1991; Meffe and Carroll 1997). This basic conservation principle of redundancy applies to Hawaiian plants. By maintaining 8 to10 viable populations in the several proposed critical habitat units, the threats represented by a fluctuating environment are alleviated and the species has a greater likelihood of achieving long-term survival and conservation. Conversely, loss of one or more of the plant populations within any critical habitat unit could result in an increase in the risk that the entire listed species may not survive and recover.

Due to the reduced size of suitable habitat areas for these Hawaiian plant species, they are now more susceptible to the variations and weather fluctuations affecting quality and quantity of available habitat, as well as direct pressure from hundreds of species of non-native plants and animals. Establishing and conserving 8 to 10 viable populations on one or more islands(s) within the historic range of the species will provide each species with a reasonable expectation of persistence and eventual recovery, even with the high potential that one or more of these populations will be eliminated by normal or random adverse events, such as hurricanes, fires, and alien plant invasions (HPPRCC 1994; Luijten *et al.* 2000; Mangel and Tier 1994; Pimm *et al.* 1998; Stacey and Taper 1992). We conclude that designation of adequate suitable habitat for 8 to 10 populations as critical habitat will help give the species a reasonable likelihood of long-term survival and recovery, based on currently available information.

In summary, the long-term survival and recovery requires the designation of critical habitat units on one or more of the Hawaiian islands with suitable habitat for 8 to 10 populations of each plant species, with the exceptions discussed above. Some of this habitat is currently not known to be occupied by these species. To recover the species, it will be necessary to conserve suitable habitat in these unoccupied units, which in turn will allow for the establishment of additional populations through natural recruitment or managed reintroductions. Establishment of these additional populations will increase the likelihood that the species will survive and recover in the face of normal and stochastic events (*e.g.*, hurricanes, fire, and non-native species introductions) (Pimm *et al.* 1998; Stacey and Taper 1992; Mangel and Tier 1994).

In this proposal, we have defined the primary constituent elements on the basis of the habitat features of the areas in which the plants are reported from such as the type of plant community, the associated native plant species, the 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 one or more of the 99 plant species.

We have delineated proposed critical habitat units in the following manner:

1. We focused on designating units representative of the known current and historical geographic and elevational range of each species;

2. Proposed critical habitat units would allow for expansion of existing wild populations and reestablishment of wild populations within historic range, as recommended by the recovery plans for each species; and

3. Critical habitat boundaries were delineated in such a way that areas with overlapping occupied or potentially suitable unoccupied habitat could be depicted clearly (multi-species units).

We began by creating rough models for each species by screen digitizing polygons (map units) using ArcView (ESRI), a computer GIS program. The polygons were created by overlaying current and historic plant location points onto a digital map of the island's elevation range and vegetation types.

The resulting shape files (delineating historic range and potential, suitable habitat) were then evaluated. Elevation ranges were further refined and land areas identified as not suitable for a particular species (*i.e.,* not containing the primary constituent elements) were avoided. The resulting shape files for each species then were considered to define all suitable habitat on the island, including occupied and unoccupied habitat.

These shape files of potentially suitable habitat were further evaluated. Several factors were then used to delineate the proposed critical habitat units from these land areas. We reviewed the recovery objectives as described above and in recovery plans for each of the species to determine if the number of populations and population size requirements needed for full recovery would be available within the critical habitat units identified as containing the appropriate primary constituent elements for each species. If more than the area needed for the number of recovery populations was identified as potentially suitable, only those areas within the least disturbed suitable habitat were designated as proposed critical habitat. A population for this purpose is defined as a discrete aggregation of individuals located a sufficient distance from a neighboring aggregation such that the two are not affected by the same small-scale events and are not believed to be consistently cross-pollinated. In the absence of more specific information indicating the appropriate distance to assure limited cross-pollination, we are using a distance of 1,000 m (3,281 ft) based on our review of current literature on gene flow (Barret and Kohn 1991; Fenster and Dudash 1994; Havens 1998; Schierup and Christiansen 1996).

Using the above criteria, we delineated the proposed critical habitat for each species. When species units overlapped, we combined units for ease of mapping. Such critical habitat units encompass a number of plant communities. Using satellite imagery and parcel data we then eliminated areas that did not contain the appropriate vegetation, associated native plant species, or features such as cultivated agriculture fields, housing developments or other areas that are unlikely to contribute to the conservation of one or more of the 99 plant species. Geographic features (ridge lines, valleys, streams, coastlines, etc.) or man-made features (roads or obvious land use) that created an obvious boundary for a unit were used as unit area boundaries. We also used watershed delineations to dissect very large proposed critical habitat units in order to simplify the unit mapping and their descriptions.

Within the critical habitat boundaries, adverse modification under section 7 generally would occur only if the primary constituent elements are affected. Therefore, not all activities within critical habitat would trigger an adverse modification conclusion. In defining critical habitat boundaries, we made an attempt to avoid areas, such as towns and other similar lands that are unlikely to contribute to the

conservation of the 99 species. However, the minimum mapping unit that we used to approximate our delineation of critical habitat for these species did not allow us to exclude all such developed areas. In addition, existing features and structures within the boundaries of the mapped units, such as buildings, roads, aqueducts, telecommunications equipment, telemetry antennas, radars, missile launch sites, arboreta and gardens, heiau (indigenous places of worship or shrines), airports, other paved areas, and other rural residential areas do not contain one or more of the primary constituent elements and would be excluded under the terms of this proposed regulation. Federal actions limited to those areas, therefore, would not trigger a section 7 consultation, unless they affect the species and/or primary constituent elements in adjacent critical habitat.

In summary, for most of these species we utilized the approved recovery plan guidance to identify appropriately sized land units containing suitable occupied and unoccupied habitat. These areas are our best estimation of the habitat necessary to provide for the recovery of these 99 species.

E. Managed Lands

Currently occupied or historically known sites containing one or more of the primary constituent elements considered essential to the conservation of these 99 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 these plants at these sites, including published reports and surveys; annual performance and progress reports; 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.

Pursuant to the definition of critical habitat in section 3 of the Act, the primary constituent elements as found in any area so designated must also require ''special management considerations or protections.'' Adequate special management or protection is provided by a legally operative plan that addresses the maintenance and improvement of the essential elements and provides for the long-term conservation of the species. We consider a plan adequate when it: (1) Provides a conservation benefit to the species (*i.e.*, the plan must maintain or provide for an increase in the species' population or the enhancement or restoration of its habitat within the area covered by the plan); (2) provides assurances that the management plan will be implemented (*i.e.*, those responsible for implementing the plan are capable of accomplishing the objectives, have an implementation schedule and/or have adequate funding for the management plan); and, (3) provides assurances the conservation plan will be effective (*i.e.*, it identifies biological goals, has provisions for reporting progress, and is of a duration sufficient to implement the plan and achieves the plan's goals and objectives). If an area is covered by a plan that meets these criteria, it does not constitute critical habitat as defined by the Act because the primary constituent elements found there are not in need of special management.

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:

(1) The factors that led to the listing of the species, as described in the final rules for listing each of the species. Effects of clearing and burning for agricultural purposes and of invasive non-native plant and animal species have contributed to the decline of nearly all endangered and threatened plants in Hawaii (Smith 1985; Howarth 1985; Stone 1985; Wagner *et al.* 1985; Scott *et al.* 1986; Cuddihy and Stone 1990; Vitousek 1992; Service 1994, 1995a, 1995b, 1996a, 1996b, 1996c, 1996d, 1997, 1998a, 1998b, 1999; Loope 1998).

Current threats to these species include non-native grass and shrub-carried wildfire; browsing, digging, rooting, and trampling from feral ungulates (including goats, deer, and pigs); direct and indirect effects of non-native plant invasions, including alteration of habitat structure and microclimate; and disruption of pollination and gene-flow processes by adverse effects of mosquito-borne avian disease on forest bird pollinators, direct competition between native and non-native insect pollinators for food, and predation of native insect pollinators by non-native hymenopteran insects (ants). In addition, physiological processes such as reproduction and establishment continue to be stifled by fruit and flower eating pests such as non-native arthropods, mollusks, and rats, and photosynthesis and water transport affected by non-native insects, pathogens and diseases. Many of these factors interact with one another, thereby compounding effects. Such interactions include non-native plant invasions altering wildfire regimes, feral ungulates vectoring weeds and disturbing vegetation and soils thereby facilitating dispersal and establishment of non-native plants, and numerous non-native insects feeding on native plants, thereby increasing their vulnerability and exposure to pathogens and disease (Howarth 1985; Smith 1985; Scott *et al.* 1986; Cuddihy and Stone 1990; Mack 1992; D'Antonio and Vitousek 1992; Tunison *et al.* 1992; Service 1994, 1995a, 1995b, 1996a, 1996b, 1996c, 1996d, 1997, 1998a, 1998b, 1999; Bruegmann *et al.* 2001).

(2) The recommendations from the HPPRCC in their 1998 report to us (''Habitat Essential to the Recovery of Hawaiian Plants''). As summarized in this report, recovery goals for endangered Hawaiian plant species cannot be achieved without the effective control of non-native species threats, wildfire, and land use changes.

(3) The management actions needed for assurance of survival and ultimate recovery of Hawaii's endangered plants. These actions are described in our recovery plans for these 99 species (Service 1994, 1995a, 1995b, 1996a, 1996b, 1996c, 1996d, 1997, 1998a, 1998b, 1999), in the 1998 HPPRCC report to us (HPPRCC 1998), 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) non-native plant control; (3) rodent control; (4) invertebrate pest control; (5) fire management; (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 (Service 1994, 1995a, 1995b, 1996a, 1996b, 1996c, 1996d, 1997, 1998a, 1998b, 1999). 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; wildfire management; non-native plant control; rodent control; invertebrate pest 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; and control of human activities/access.

As shown in Table 2, the proposed critical habitat designations for 99 species of plants are found on Federal, State, and private lands on the island of Oahu. Information received in response to our public notices, meetings, and information in our files indicated that there is some on-going conservation management action for these plants, as noted below. However, without management plans and assurances that the plans will be implemented, we are unable to find that the land in question does not require special management or protection.

Federal Lands

The Sikes Act Improvements Act of 1997 (Sikes Act) requires each military installation that includes land and water suitable for the conservation and management of natural resources to complete, by November 17, 2001, an INRMP. An INRMP integrates implementation of the military mission of the installation with stewardship of the natural resources found there. Each INRMP includes an assessment of the ecological needs on the installation, including needs to provide for the conservation of listed species; a statement of goals and priorities; a detailed description of management actions to be implemented to provide for these ecological needs; and a monitoring and adaptive management plan. We consult with the military on the development and implementation of INRMPs for installations with listed species. We believe that bases that have completed and approved INRMPs that address the needs of the species generally do not meet the definition of critical habitat discussed above, because they require no additional special management or protection. Therefore, we do not include these areas in critical habitat designations if they meet the following three criteria: (1) A current INRMP must be complete and provide a conservation benefit to the species; (2) the plan must provide assurances that the conservation management strategies will be implemented; and (3) the plan must provide assurances that the conservation management strategies will be effective, by providing for periodic monitoring and revisions as necessary. If all of these criteria are met, then the lands covered under the plan would not meet the definition of critical habitat.

Lands Under U.S. Army Jurisdiction

The Army has six installations under its jurisdiction on Oahu-Dillingham Military Reservation (DMR), Kawailoa Training Area (KLOA), Kahuku Training Area (KTA), Makua Military Reservation (MMR), Schofield Barracks Military Reservation (SBMR) and Schofield Barracks East Range (SBER). All of these lands are administered by the Army Garrison, Hawaii for various types of routine military training. The Army has written an Integrated Natural Resources Management Plan (INRMP) for all of the Oahu training areas (Army 2001b), Ecosystem Management Plan (Army 1998), an Endangered Species Management Plan (Research Corporation of Hawaii (RCUH) 1998), a Wildland Fire Management Plan (which is finalized only for MMR at this time) (Army 2000), monthly summary reports (Col. W.E. Ryan III, Army, *in litt.* 2000–2002), and annual reports on the natural resources management projects performed under the Ecosystems Management Program for all of these installations (RCUH 1998, 1999, and 2000). These documents indicate that some of the management actions identified in these plans, including their 2001 INRMP, have been implemented and have proven beneficial to populations of some species. However, current management is not sufficient to address the on-going threats to the listed plant species on these lands. In addition, there is currently no guarantee of long-term funding for management actions that are ongoing or future management actions. The Army is currently engaged in or will begin discussions with the Service to identify training-related impacts to the listed plant species at SBMR, SBER, KLOA, KTA, and DMR and develop measures that avoid, minimize and offset those impacts. However, more comprehensive management documents have not been completed at this time. Therefore, we can not, at this time, find that management on these lands under Federal jurisdiction is adequate to preclude a proposed designation of critical habitat.

Dillingham Military Reservation

Four species, *Cyperus trachysanthos, Hibiscus brackenridgei* ssp. *mokuleianus, Nototrichium humile,* and *Schiedea kealiae* are reported from the Army's Dillingham Military Reservation, though only *Schiedea kealiae* is currently known to occur on this land (Army 2001b; HINHP Database 2001). We believe this land is needed for the recovery of one or more of these four species. Currently, the Army is not implementing any management actions for these listed species at the Dillingham Military Reservation (HINHP Database 2001; Army 2001b). In addition, proposed management actions identified for *Schiedea kealiae* in the 2001 INRMP are ''subject to available funding''. We do not believe that appropriate conservation management strategies have been adequately funded or effectively implemented. Therefore, we cannot at this time find that management of this land under Federal jurisdiction is adequate to preclude a proposed designation of critical habitat. However, if an INRMP or other endangered species management plan that addresses the maintenance and improvement of the essential elements for the listed plant species reported from Dillingham Military Reservation, and provides for their long-term conservation and assurances that it will is completed and implemented, we will reassess the critical habitat boundaries in light of these management plans. Also, we may exclude these military lands under section 4(b)(2) of the Act if benefits of exclusion outweigh the benefits of including the areas within critical habitat, provided the exclusion will not result in extinction of the species.

Kahuku Training Area

Ten species, *Adenophorus periens, Chamaesyce rockii, Cyanea grimesiana* ssp. *grimesiana, Cyanea koolauensis, Cyanea longiflora, Eugenia koolauensis, Gardenia mannii, Hesperomannia arborescens, Phyllostegia hirsuta,* and *Tetraplasandra gymnocarpa,* are reported from the Army's Kahuku Training Area though only *Cyanea koolauensis, Eugenia koolauensis, Gardenia mannii, Hesperomannia arborescens,* and *Tetraplasandra gymnocarpa* are currently known to occur on this land (HINHP Database 2001; Army 2001b). We believe this land is needed for the recovery of one or more of these 10 species. Currently, management actions for listed plants at Kahuku Training Area consists of weed control around known populations of *Eugenia koolauensis* and collection of

propagules for propagation and eventual outplanting (Army 2001b). Proposed management actions identified for listed plant species in the 2001 INRMP are ''subject to available funding''. We do not believe that there are sufficient assurances that appropriate conservation management strategies will be adequately funded or effectively implemented. Therefore, we cannot at this time find that management of this land under Federal jurisdiction is adequate to preclude a proposed designation of critical habitat. However, if an INRMP or other endangered species management plan that addresses the maintenance and improvement of the essential elements for the listed plant species reported from Kahuku Training Area, and provides for their long-term conservation and assurances that it will is completed and implemented, we will reassess the critical habitat boundaries in light of these management plans. Also, we may exclude these military lands under section 4(b)(2) of the Act if benefits of exclusion outweigh the benefits of including the areas within critical habitat, provided the exclusion will not result in extinction of the species.

Kawailoa Training Area

Twenty-nine species, *Adenophorus periens, Chamaesyce rockii, Cyanea acuminata, Cyanea crispa, Cyanea grimesiana* ssp. *grimesiana, Cyanea humboldtiana, Cyanea koolauensis, Cyanea longiflora, Cyanea st.-johnii, Cyrtandra dentata, Cyrtandra viridiflora, Delissea subcordata, Eugenia koolauensis, Gardenia mannii, Hesperomannia arborescens, Labordia cyrtandrae, Lobelia gaudichaudii* ssp. *koolauensis, Lobelia oahuensis, Melicope lydgatei, Myrsine juddii, Phlegmariurus nutans, Phyllostegia hirsuta, Phyllostegia parviflora, Plantago princeps, Platanthera holochila, Pteris lidgatei, Sanicula purpurea, Tetraplasandra gymnocarpa,* and *Viola oahuensis,* are reported from the Army's Kawailoa Training Area, and 23 of the 29 plant species (*Chamaesyce rockii, Cyanea acuminata, Cyanea crispa, Cyanea humboldtiana, Cyanea koolauensis, Cyanea st.-johnii, Cyrtandra dentata, Cyrtandra viridiflora, Eugenia koolauensis, Gardenia mannii, Hesperomannia arborescens, Lobelia gaudichaudii* ssp. *koolauensis, Lobelia oahuensis, Melicope lydgatei, Myrsine juddii, Phlegmariurus nutans, Phyllostegia hirsuta, Phyllostegia parviflora, Plantago princeps, Pteris lydgatei, Sanicula purpurea, Tetraplasandra gymnocarpa,* and *Viola oahuensis*) are currently known to occur on this land (HINHP Database 2001; Army 2001b). We believe this land is needed for the recovery of one or more of these 29 species. Currently, management for listed plant species at Kawailoa Training area includes monitoring to examine population health, the collection of propagules for ex-situ propagation, and the identification of threats to these populations. The populations of *Cyanea st.-johnii* and *Cyrtandra viridiflora* have been intensely monitored since 1999. The Army plans to construct a fenced exclosure around the *Cyrtandra viridiflora* population to protect the individuals from browsing by feral ungulates. *Gardenia mannii* has been actively monitored for threats and competition from exotic plants but no fences have been erected to prevent browsing from feral pigs (Army 2001b). Proposed management actions identified for listed plant species in the 2001 INRMP are ''subject to available funding''. We do not believe that the current management measures are sufficient to address the primary threats to these species, nor do we believe that there are appropriate assurances that appropriate conservation management strategies will be adequately funded or effectively implemented. Therefore, we cannot at this time find that management of this land under Federal jurisdiction is adequate to preclude a proposed designation of critical habitat. However, if an INRMP or other endangered species management plan that addresses the maintenance and improvement of the essential elements for the listed plant species reported from Kawailoa Training Area, and provides for their long-term conservation and assurances that it will be implemented, we will reassess the critical habitat boundaries in light of these management plans. Also, we may exclude these military lands under section 4(b)(2) of the Act if benefits of exclusion outweigh the benefits of including the areas within critical habitat, provided the exclusion will not result in extinction of the species.

Makua Military Reservation

Thirty-one species, *Alectryon macrococcus, Alsinidendron obovatum, Bonamia menziesii, Cenchrus agrimonioides, Chamaesyce celastroides var. keanana, Ctenitis squamigera, Cyanea superba, Cyrtandra dentata, Delissea subcordata, Diellia falcata, Dubautia herbstobatae, Euphorbia haeleeleana, Flueggea neowawraea, Hedyotis degeneri, Hedyotis parvula, Hibiscus brackenridgei, Lepidium arbuscula, Lipochaeta tenuifolia, Lobelia niihauensis, Lobelia oahuensis, Neraudia angulata, Nototrichium humile, Plantago princeps, Sanicula mariversa, Schiedea hookeri, Schiedea nuttallii, Silene lanceolata, Spermolepis hawaiiensis, Tetramolopium filiforme, Tetramolopium lepidotum* ssp. *lepidotum,* and *Viola chamissoniana* ssp. *chamissoniana,* are reported from the Army's Makua Military Reservation, and all but *Tetramolopium lepidotum* ssp. *lepidotum* are currently known to occur on this land (HINHP Database 2001; Army 2001b). We believe this land is needed for the recovery of one or more of these 31 species. Currently, management for listed plant species at Makua Military Reservation includes monitoring to examine population health, the collection of propagules for ex-situ propagation, and the identification of threats to these populations. Seeds of *Alectryon macroccocus, Alsinidendron obovatum, Cenchrus agrinomioides, Cyanea superba* ssp. *superba, Hedyotis degeneri, Hedyotis parvula, Sanicula mariversa, Silene lanceolata,* and *Viola chamissoniana* ssp. *chamissoniana* have been collected and propagated for future reintroduction into protected habitat. Slug control has been initiated on populations of *Alsinidendron obovatum* and intensive rat control has been implemented for *Euphorbia haeleeleana.* Erosion barriers have been constructed to protect *Sanicula mariversa* populations. Fenced exclosures have been constructed around populations of *Cenchrus agrinomioides, Cyanea superba* ssp. *superba, Cyrtandra dentata, Delissea subcordata,* and *Diellia falcata* to protect them from browsing by feral ungulates. Fenced exclosures for some species are not possible due to unexploded ordnance hazards near individual plants, for example, of *Flueggea neowawraea* (Army 2001b). While we believe that some of these species specific actions may control threats in the short term, we do not believe that these measures are sufficient to address the primary threats to all of the species reported from Makua Military Reservation at this time. The Army has completed a programmatic section 7 consultation with the Service for Makua Military Reservation. We issued a biological opinion of no jeopardy for the Army's routine training on June 23, 1999. Part of the Army's proposed action included the development and implementation of an Implementation Plan (IP) to outline detailed steps needed to stabilize the species impacted by Army training. The IP is still in the development phase and may not be completed for another year.

If the implementation plan addresses the maintenance and improvement of the essential elements for the listed plant species reported from Makua Military Reservation, and provides for their long-term conservation and assurances that it will be implemented, we will reassess the critical habitat boundaries in light of the Implementation Plan. However, we cannot at this time find that management of this land under Federal jurisdiction is adequate to preclude a proposed designation of critical habitat. In addition, we may exclude these military lands under section 4(b)(2) of the Act if benefits of exclusion outweigh the benefits of including the areas within critical habitat, provided the exclusion will not result in extinction of the species.

Schofield Barracks East Range

Seventeen species, *Chamaesyce rockii, Cyanea acuminata, Cyanea koolauensis, Cyanea longiflora, Cyanea st.johnii, Cyrtandra subumbellata, Gardenia mannii, Hesperomannia arborescens, Isodendrion laurifolium, Lobelia gaudichaudii* ssp. *koolauensis, Lobelia oahuensis, Plegmariurus nutans, Phyllostegia hirsuta, Pteris lidgatei, Sanicula pupurea, Tetraplasandra gymnocarpa*, and *Viola oahuensis*, are reported from the Army's Schofield Barracks East Range, and all but *Cyanea longiflora, Cyanea st.johnii*, and *Lobelia oahuensis* are currently known to occur on this land (HINHP Database 2001; Army 2001b). We believe this land is needed for the recovery of one or more of these 17 species. Currently, management for listed plant species at Schofield Barracks East Range includes monitoring of some plant populations, the collection of propagules for ex-situ propagation, and the identification of threats to the rare plant populations. *Phlegmariurus nutans* is the only species at Schofield Barracks East Range that has been collected for ex-situ propagation and results have been unsuccessful (Army 2001b). Proposed management actions identified for listed plant species in the 2001 INRMP are ''subject to available funding''. We do not believe that the current management measures are sufficient to address the primary threats to these species, nor do we believe that there are sufficient assurances that appropriate conservation management strategies will be adequately funded or effectively implemented. Therefore, we cannot at this time find that management of this land under Federal jurisdiction is adequate to preclude a proposed designation of critical habitat. However, if an INRMP or other endangered species management plan that addresses the maintenance and improvement of the essential elements for the listed plant species reported from Schofield Barracks East Range, and provides for their long-term conservation and assurances that it will be implemented, we will reassess the critical habitat boundaries in light of these management plans. Also, we may exclude these military lands under section 4(b)(2) of the Act if benefits of exclusion outweigh the benefits of including the areas within critical habitat, provided the exclusion will not result in extinction of the species.

Schofield Barracks Military Reservation

Thirty-four species, *Abutilon sandwicense, Alectryon macrococcus, Alsinidendron trinerve, Cenchrus agriminioides, Ctenitis squamigera, Cyanea acuminata, Cyanea grimesiana* ssp. *grimesiana, Cyanea grimesiana* ssp. *obatae, Cyanea superba, Delissea subcordata, Diellia falcata, Diplazium molokaiense, Eragrostis fosbergii, Flueggea neowawraea, Gardenia mannii, Isodendrion longifolium, Labordia cyrtandrae, Lepidium arbuscula, Lipochaeta lobata* var. *leptophylla, Lipochaeta tenuifolia, Lobelia niihauensis, Lobelia oahuensis, Neraudia angulata, Nototrichium humile, Phyllostegia hirsuta, Phyllostegia mollis, Plantago princeps, Schiedea hookeri, Schiedea nuttalii, Solanum sandwicense, Stenogyne kanehoana, Tetramolopium lepidotum* ssp. *lepidotum, Urera kaalae*, and *Viola chamissoniana* ssp. *chamissoniana*, are reported from the Army's Schofield Barracks Military Reservation and 23 of the 34 plant species are currently known to occur on this land (HINHP Database 2001; Army 2001b). Eleven species, *Cenchrus agriminioides, Ctenitis squamigera, Cyanea grimesiana* ssp *obatae, Cyanea superba, Diplazium molokaiense, Eragrostis fosbergii, Neraudia angulata, Nototrichium humile, Schiedea nuttalii, Solanum sandwicense*, and *Stenogyne kanehoana* are only known from historical records. We believe this land is needed for the recovery of one or more of these 34 species. Currently, management for listed plant species at Schofield Barracks Military Reservation includes rare plant surveys and the identification and monitoring of threats to the rare plant species. Propagules of *Alectryon macrococcus, Flueggea neowawraea, Gardenia mannii, Phyllostegia hirsuta, Urera kaalae*, and *Viola chamissoniana* ssp. *chamissoniana* have been collected and are being propagated for outplanting into protected habitat. Propagated individuals of *Flueggea neowawraea*, and *Urera kaalae* have already been outplanted into habitat that is protected by ungulate exclosure fences and is regularly monitored for alien plant species. Monitoring for many of the rare plants at Schofield Barracks Military Reservation is restricted due to unexploded ordnance hazards (Army 2001b). Proposed management actions identified for listed plant species in the 2001 INRMP are ''subject to available funding''. We do not believe that the current management measures are sufficient to address the primary threats to these species, nor do we believe that there are sufficient assurances that appropriate conservation management strategies will be adequately funded or effectively implemented. Therefore, we cannot at this time find that management of this land under Federal jurisdiction is adequate to preclude a proposed designation of critical habitat. However, if an INRMP or other endangered species management plan that addresses the maintenance and improvement of the essential elements for the listed plant species reported from Schofield Barracks Military Reservation, and provides for their long-term conservation and assurances that it will be implemented, we will reassess the critical habitat boundaries in light of these management plans. Also, we may exclude these military lands under section 4(b)(2) of the Act if benefits of exclusion outweigh the benefits of including the areas within critical habitat, provided the exclusion will not result in extinction of the species.

Hawaii Army National Guard

One plant species, *Cyperus trachysanthos*, occurs on HIARNG lands at Diamond Head Crater (HINHP Database 2001). We conducted surveys and prepared management plans for all HIARNG lands in Hawaii, including Diamond Head Crater (Service 1998c and 2001). Current management on HIARNG lands at Diamond Head include rare plant seed collection for off-site propagation, fire control, some weed control, and some habitat restoration. However, these actions are not sufficient to address the on-going threats to this species on this land. In addition, currently there is no guarantee that appropriate conservation management strategies will be adequately funded or effectively implemented. Therefore, we cannot, at this time, find that management on these lands is adequate to preclude a proposed designation of critical habitat.

Naval Magazine Pearl Harbor Lualualei Branch and Naval Computer and Telecommunication Area Master Station Pacific Transmitting Facility at Lualualei

The U.S. Navy (Navy) owns or leases much of Lualualei Valley, which is operated as a naval magazine and transmitting facility. One species, *Marsilea villosa*, occurs on land at the Naval Computer and Telecommunications Area Master Station Pacific Radio Transmitting Facility at Lualualei and we believe this land is needed for the recovery of this species. Some management actions to protect and maintain the population are included in the 2001 INRMP but these actions have not been adequately funded or effectively implemented (HINHP Database 2001; Navy 2001a). Therefore, we cannot at this time find that management of this land under Federal jurisdiction is adequate to preclude a proposed designation of critical habitat. However, if an INRMP or other endangered species management plan that addresses the maintenance and improvement of the essential elements for *Marsilea villosa*, and provides for its long-term conservation and assurances that it will be implemented, we will reassess the critical habitat boundaries in light of these management plans. Also, we may exclude this military land under section 4(b)(2) of the Act if benefits of exclusion outweigh the benefits of including the area within critical habitat, provided the exclusion will not result in extinction of the species.

Twenty-three species, *Abutilon sandwicense, Alectryon macrococcus, Bonamia menziesii, Chamaesyce kuwaleana, Diellia falcata, Flueggea neowawraea, Hedyotis parvula, Lepidium arbuscula, Lipochaeta lobata, Lipochaeta tenuifolia, Lobelia niihauensis, Marsilea villosa, Melicope saint-johnii, Neraudia angulata, Nototrichium humile, Phyllostegia hirsuta, Plantago princeps, Sanicula mariversa, Schiedea hookeri, Tetramolopium filiforme, Tetramolopium lepidotum, Urera kaalae*, and *Viola chamissoniana* ssp. *chamissoniana*, are reported from the Naval Magazine Pearl Harbor Lualualei Branch land and we believe this land is needed for the recovery of one or more of these 23 species (HINHP Database 2001; Navy 2001b). One fenced exclosure at the Halona management area has been erected to protect *Abutilon sandwicense* from feral ungulates, and another exclosure at Puu Hapapa protects *Abutilon sandwicense, Bonamia menziesii, Fleuggea neowawraea, Lipochaeta lobata* var. *leptophylla*, and *Nototrichium humile* from browsing by feral ungulates. Other management actions include some monitoring of rare plants, surveying for rare plants and controlling some invasive plants in rare plant habitats (The Traverse Group 1988; Navy 1997, 2001a, 2001b). We do not believe that these measures are sufficient to address the primary threats to these species on this land, nor do we believe that appropriate conservation management strategies have been adequately funded or effectively implemented. Therefore, we cannot at this time find that management of this land under Federal jurisdiction is adequate to preclude a proposed designation of critical habitat. However, if an INRMP or other endangered species management plan that addresses the maintenance and improvement of the essential elements for these plant species, and provides for their long-term conservation and assurances that it will be implemented, we will reassess the critical habitat boundaries in light of these management plans. Also, we may exclude this military land under section 4(b)(2) of the Act if benefits of exclusion outweigh the benefits of including the area within critical habitat, provided the exclusion will not result in extinction of the species.

Oahu Forest National Wildlife Refuge

The Oahu Forest National Wildlife Refuge was established to protect and manage a portion of some of the best remaining native forest in the northern Koolau Mountains of Oahu. The southern portion of the refuge is owned by the Service, while the northern portion is private land leased by the Army as part of Schofield Barracks Military Reservation and included as an overlay refuge. Sixteen plant species (*Chamaesyce rockii, Cyanea acuminata, Cyanea koolauensis, Cyanea humboldtiana, Cyrtrandra subumbellata, Cyrtrandra viridiflora, Gardenia mannii, Hesperomannia arborescens, Lobelia gaudichaudii* ssp. *koolauensis, Lobelia oahuensis, Phlegmariurus nutans, Phyllostegia hirsuta, Pteris lydgatei, Sanicula purpurea, Tetraplasandra gymnocarpa*, and *Viola oahuensis*) are reported from the refuge lands (HINHP Database 2001). The refuge was established in December 2000 and no management plan has been developed yet. We have included this area within the critical habitat proposal.

State of Hawaii Lands

The State lands on the island of Oahu include ceded and leased lands, and those that are administered by the Department of Hawaiian Home Lands (DHHL), the Division of State Parks, and the Department of Land and Natural Resources (DLNR). Eighty-six plants are reported from State lands (*Abutilon sandwicense, Alectryon macrococcus, Alsinidendron obovatum, Alsinidendron trinerve, Bonamia menziesii, Cenchrus agrimonioides, Centaurium sebaeoides, Chamaesyce celastroides* var. *kaenana, Chamaesyce deppeana, Chamaesyce herbstii, Chamaesyce kuwaleana, Chamaesyce rockii, Colubrina oppositifolia, Ctenitis squamigera, Cyanea acuminata, Cyanea crispa, Cyanea grimesiana* ssp. *grimesiana, Cyanea grimesiana* ssp. *obatae, Cyanea humboldtiana, Cyanea koolauensis, Cyanea longiflora, Cyanea st.-johnii, Cyanea superba, Cyanea truncata, Cyperus trachysanthos, Cyrtandra dentata, Cyrtandra polyantha, Cyrtandra subumbellata, Cyrtandra viridiflora, Delissea subcordata, Diellia erecta, Diellia falcata, Diellia unisora, Dubautia herbstobatae, Eragrostis fosbergii, Eugenia koolauensis, Euphorbia haeleeleana, Flueggea neowawraea, Gardenia mannii, Gouania meyenii, Gouania vitifolia, Hedyotis degeneri, Hedyotis parvula, Hesperomannia arborescens, Hesperomannia arbuscula, Hibiscus brackenridgei, Isodendrion laurifolium, Isodendrion longifolium, Labordia cyrtandrae, Lepidium arbuscula, Lipochaeta lobata* var. *leptophylla, Lipochaeta tenuifolia, Lobelia gaudichaudii* ssp. *koolauensis, Lobelia monostachya, Lobelia niihauensis, Lobelia oahuensis, Lysimachia filifolia, Marsilea villosa, Melicope lydgatei, Melicope pallida, Myrsine juddii, Neraudia angulata, Nototrichium humile, Peucedanum sandwicense, Phlegmariurus nutans, Phyllostegia hirsuta, Phyllostegia kaalaensis, Phyllostegia parviflora, Plantago princeps, Pteris lydgatei, Sanicula mariversa, Sanicula purpurea, Schiedea hookeri, Schiedea kaalae, Schiedea kealiae, Schiedea nuttallii, Sesbania tomentosa, Silene lanceolata, Spermolepis hawaiiensis, Tetramolopium filiforme, Tetramolopium lepidotum* ssp. *lepidotum, Tetraplasandra gymnocarpa, Trematolobelia singularis, Urera kaalae, Viola chamissoniana* ssp. *chamissoniana, and Viola oahuensi*). DLNR lands on Oahu are made up of Forest Reserves, Game Hunting Units, and Natural Area Reserves (NAR). Within DLNR, DOFAW administers all of these lands.

Many of DLNR's programs provide beneficial effects to endangered species and their habitat. Hawaii DOFAW

management actions on Oahu include fences that have been built to exclude feral ungulates from rare plant sites, propagation and dissemination of native tree species that help restore native plant assemblages around the island, participation in a cooperative watershed management partnership with other Federal and State agencies and private land owners, and administration of programs that either directly or indirectly benefit endangered species and their habitats.

DOFAW has four fenced areas on Oahu for the protection of rare plants. An area of approximately 101 ha (250 ac) is fenced in Pahole Gulch within Pahole NAR for the protection of numerous endangered plant species and the endangered land snail *Achatinella mustelina*. DOFAW is currently seeking funding for an additional large fence within Pahole NAR in adjacent Kapuna Gulch. In addition, DOFAW has constructed three other, small rare plant exclosures for the protection of extant rare plant populations and reintroduction of propagated material (Marie Bruegmann, Service, pers. comm., 2001).

DOFAW's Natural Area Reserves System (NARS) was established in 1970 with the intent to preserve and maintain unique Hawaiian ecosystems and geological features. The island of Oahu has three NARs that encompass a total of 728 ha (1,799 ac). All three of these NARs harbor endangered species and are managed primarily to maintain the native ecosystems that support these species. Management plans have been developed for these NARs and intensive management actions that have occurred in the NARs include construction of feral ungulate exclosure fences around particularly unique plant communities and endangered species; treatment of endangered tree species for invasive alien insects, physical and chemical control of alien plant populations, rat baiting, and feral cat trapping (DLNR 1988a and b, 1990).

The other DOFAW-administered program on the island that has indirect benefits to endangered plant species is the Hawaii Forest Stewardship Program (FSP). Forest Stewardship projects are designed to be implemented over a 1-year period where private landowners are provided funds to establish forestry projects over a 4-year period and maintain these projects over the subsequent 10 years. Projects can be variable in nature and use native and non-native species. A few of these projects that have focused on native forest habitat restoration in areas that harbor endangered plant species have demonstrated success in restoring native forest habitat suitable for the maintenance and recovery of endangered plant species. We believe that private landowners in this program have the potential to contribute to the recovery of endangered plant species. However, no FSP projects have been implemented on Oahu to date (Vickie Caraway, DOFAW, pers. comm., 2001).

Numerous efforts by the State of Hawaii on Oahu contribute to the conservation of listed plant species, including their rare plant management activities and administration of the NARs. However, these programs do not adequately address the threats to the listed plant species on their lands. In addition, there are no comprehensive management plans for the long-term conservation of endangered and threatened plants on these lands, no updated detailed reports on management actions conducted, and no assurances that management actions will be implemented. Therefore, we cannot, at this time, find that management on these State lands is adequate to preclude a proposed designation of critical habitat.

Partnership (Federal-State-Private) Lands

Koolau Mountains Watershed Partnership

Thirty-five species (*Bonamia menziesii, Chamaesyce deppeana, Chamaesyce rockii, Cyanea acuminata, Cyanea crispa, Cyanea grimesiana* ssp. *grimesiana, Cyanea humboldtiana, Cyanea koolauensis, Cyanea st.-johnii, Cyanea truncata, Cyrtandra dentata, Cyrtandra polyantha, Cyrtandra subumbellata, Cyrtandra viridiflora, Diellia erecta, Eugenia koolauensis, Gardenia mannii, Hesperomannia arborescens, Isodendrion longifolium, Lobelia gaudichaudii* ssp. *koolauensis, Lobelia monostachya, Lobelia oahuensis, Lysimachia filifolia, Melicope lydgatei, Myrsine juddii, Phlegmariurus nutans, Phyllostegia hirsuta, Phyllostegia parviflora, Plantago princeps, Pteris lidgatei, Sanicula purpurea, Schiedea kaalae, Tetraplasandra gymnocarpa, Trematolobelia singularis*, and *Viola oahuensis*) are reported from the Koolau Mountains Watershed Management lands owned by State, Federal, and private entities on Oahu (GDSI Database 2001; HINHP Database 2001). In an effort to better protect native biological resources, landowners and other interested parties established a voluntary partnership to cooperatively manage some of the lands within the Koolau Mountains. The partnership cooperative agreement, signed in 1999, indicates the shared interest in the joint management of threats shared by the landowners involved. The partnership is completing a natural resources management plan that will include, feral animal and alien plant control measures, collaborative research projects, and habitat protection and restoration (Craig Rowland, Service, pers. comm., 2001). Because no management plan is developed yet, management has been implemented only in small areas, and there is no long-term commitment of funding, we cannot, at this time, find that management on these lands is adequate to preclude a proposed designation of critical habitat.

Opaeula Watershed Protection Project

The partners in this effort are Kamehameha Schools, the Army, DOFAW, and the Service. The project, located on land owned by Kamehameha Schools in the Koolau Mountains, entails construction of an ungulate exclusion fence and removal of ungulates from within the 61 ha (150 ac) enclosure. The wet summit crest shrubland and forest within the enclosure contains four of the 99 species: *Chamaesyce rockii, Cyrtandra viridiflora, Myrsine juddii*, and *Viola oahuensis* (C. Rowland, pers. comm., 2002). Because there is no management plan and no long-term commitment of funding, we cannot, at this time, find that management on this land is adequate to preclude a proposed designation of critical habitat.

Waianae Mountains Feral Goat Management Group

The Waianae Mountains Feral Goat Management Group is a voluntary group composed of 12 Federal, State, and county agencies and private organizations with the mission of ''* * * working together cooperatively to manage feral goats for the protection of Hawaiian plants, animals, watersheds, and ecosystems.'' The group has developed short-term goals and has ongoing projects regarding feral goat control in the Waianae Mountains, but has no detailed plan and no long-term funding, or jurisdiction other than on the lands of each participating agency or organization. In addition, the group is only addressing one of the many threats to endangered plants in the Waianae Mountains. Therefore, we cannot, at this time, find that management on these lands is adequate to preclude a proposed designation of critical habitat.

Private Lands

Honouliuli Preserve

The Honouliuli Preserve is a 1,494 ha (3,692 ac) preserve managed by TNCH through a long-term lease with the landowner, the Estate of James Campbell. Several rare native plant communities and endangered animals, along with 25 plant species (*Abutilon sandwicense*, *Alectryon macrococcus*, *Cenchrus agrimonioides*, *Chamaescye herbstii*, *Cyanea grimesiana* ssp. *grimesiana*, *Cyanea grimesiana* ssp. *obatae*, *Delissea subcordata*, *Diellia falcata*, *Diellia unisora*, *Flueggea neowawraea*, *Gardenia mannii*, *Hesperomannia arbuscula*, *Lipochaeta lobata* var. *leptophylla*, *Melicope saint-johnii*, *Neraudia angulata*, *Phyllostegia hirsuta*, *Phyllostegia kaalaensis*, *Phyllostegia mollis*, *Phyllostegia parviflora*, *Plantago princeps*, *Schiedea hookeri*, *Schiedea kaalae*, *Stenogyne kanehoana*, *Tetramolopium lepidotum* ssp. *lepidotum*, and *Urera kaalae*). TNCH has developed a management plan for the preserve that includes ungulate control, rodent control, weed control, fire control, and reintroduction of endangered and other rare plant species (TNCH 1997). Some of the management actions identified have been implemented and have proven beneficial to populations of some species, and a new plan is currently being developed to incorporate more rare plant management and reintroduction actions (TNCH, *in litt.* 2000; Trae Menard, TNCH, pers. comm., 2001). However, these actions do not adequately address the on-going threats to the listed plant species on this land. In addition, there is currently no guarantee of long-term funding for ongoing or future management actions. Therefore, we cannot, at this time, find that management on these private lands is adequate to preclude a proposed designation of critical habitat.

Ihiihilauakea Preserve

TNCH also manages the Ihiihilauakea Preserve on Oahu, through a conservation agreement with the City and County of Hawaii. This preserve harbors one endangered species, *Marsilea villosa*. There is an existing management plan for the site (TNCH 1990), and a new site restoration plan is being developed that will involve turning the preserve over to a local community group for volunteer management. TNCH has conducted periodic weed control efforts at this site, but there is no long-term commitment of funds for adequate management (T. Menard, pers. comm., 2001). Therefore, for these reasons we cannot, at this time, find that management on these lands is adequate to preclude a proposed designation of critical habitat.

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 the 99 listed species at issue in this proposed designation, 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 addition, we are aware that other private landowners and the State of Hawaii are considering the development of land management plans or agreements that may promote the conservation and recovery of endangered and threatened plant species on the island of Oahu. We support these efforts and provide technical assistance whenever possible. We are also soliciting comments on whether future development and approval of conservation measures (*e.g.,* Habitat Conservation Plans, Conservation Agreements, Safe Harbor Agreements) should trigger revision of designated critical habitat to exclude such lands and, if so, by what mechanism.

The proposed critical habitat units described below constitute our best assessment of the physical and biological features needed for the conservation of the 99 plant species, and the special management needs of these species, and are based on the best scientific and commercial information available and described above. We put forward this proposal acknowledging that we may have incomplete information regarding many of the primary biological and physical requirements for these species. However, both the Act and the relevant court order requires us to proceed with designation at this time based on the best information available. As new information accrues, we may reevaluate which areas warrant critical habitat designation. We anticipate that comments received through the public review process and from any public hearings, if requested, will provide us with additional information to use in our decision making process and in assessing the potential impacts of designating critical habitat for one or more of these species.

The approximate areas of proposed critical habitat by landownership or jurisdiction are shown in Table 4.

TABLE 4.—APPROXIMATE PROPOSED CRITICAL HABITAT AREA BY UNIT AND LAND OWNERSHIP OR JURISDICTION, HONOLULU COUNTY, OAHU [1].

Unit name	State/local	Private	Federal	Total
Oahu A	5,778 ha (14,278 ac)	1,901 ha (4,698 ac)	824 ha (2,036 ac)	8,503 ha (21,013 ac)
Oahu B	34 ha (83 ac)			34 ha (83 ac)
Oahu C	14 ha (35 ac)			14 ha (35 ac)
Oahu D	110 ha (271 ac)			110 ha (271 ac)
Oahu E	38 ha (94 ac)			38 ha (94 ac)
Oahu F	44 ha (109 ac)		37 ha (91 ac)	81 ha (200 ac)
Oahu G			16 ha (40 ac)	16 ha (40 ac)
Oahu H			28 ha (68 ac)	28 ha (68 ac)
Oahu I	1,138 ha (2,813 ac)	3,056 ha (7,552 ac)	914 ha (2,258 ac)	5,109 ha (12,623 ac)
Oahu J			10 ha (25 ac)	10 ha (25 ac)
Oahu K			7 ha (18 ac)	7 ha (18 ac)
Oahu L	7,938 ha (19,617 ac)	21,170 ha (52,313 ac)	960 ha (2,371 ac)	30,068 ha (74,301 ac)
Oahu M	<1 ha (<1 ac)	99 ha (245 ac)		100 ha (246 ac)
Oahu N	5 ha (12 ac)			5 ha (12 ac)
Oahu O	184 ha (455 ac)	247 ha (611 ac)		431 ha (1,066 ac)
Oahu P	2 ha (3 ac)			2 ha (3 ac)

TABLE 4.—APPROXIMATE PROPOSED CRITICAL HABITAT AREA BY UNIT AND LAND OWNERSHIP OR JURISDICTION, HONOLULU COUNTY, OAHU [1].—Continued

Unit name	State/local	Private	Federal	Total
Oahu Q	1 ha (3 ac)			1 ha (3 ac)
Oahu R	6 ha (15 ac)			6 ha (15 ac)
Oahu S	4 ha (12 ac)			4 ha (12 ac)
Oahu T	4 ha (9 ac)			4 ha (9 ac)
Oahu U	27 ha (67 ac)			27 ha (67 ac)
Oahu V	4 ha (10 ac)			4 ha (10 ac)
Oahu W	339 ha (839 ac)	<1 ha (<1 ac)		340 ha (840 ac)
Oahu X1	117 ha (290 ac)			117 ha (290 ac)
Oahu X2	8 ha (21 ac)			8 ha (21 ac)
Total	15,797 ha (39,037 ac)	26,474 ha (65,420 ac)	2,796 ha (6,907 ac)	45,067 ha (111,364 ac)

[1] Area differences due to digital mapping discrepancies between TMK data (GDSI 2000) and USGS coastline, or differences due to rounding.

Proposed critical habitat includes habitat for 99 species under private, State, and Federal jurisdiction (owned and leased lands), with Federal lands including lands managed by the Department of Defense and the Service. Lands proposed as critical habitat have been divided into 25 units (Oahu A through Oahu X) on the island of Oahu. A brief description of each unit is presented below.

Descriptions of Critical Habitat Units

Oahu A

The proposed unit Oahu A provides occupied habitat for 58 species: *Abutilon sandwicense, Alectryon macrococcus, Alsinidendron obovatum, Alsinidendron trinerve, Bonamia menzeisii, Cenchrus agrimonioides, Centaurium sebaeoides, Chamaesyce celastroides* var. *kaenana, Chamaesyce herbstii, Colubrina oppositifolia, Ctenitis squamigera, Cyanea acuminata, Cyanea grimesiana* ssp. *obatae, Cyanea longiflora, Cyanea superba, Cyperus trachysanthos, Cyrtandra dentata, Delissea subcordata, Diellia falcata, Dubautia herbstobatae, Eragrostis fosbergii, Eugenia koolauensis, Euphorbia haeleeleana, Fluggea neowawraea, Gardenia mannii, Gouania meyenii, Gouania vitifolia, Hedyotis degeneri, Hedyotis parvula, Hesperomannia arborescens, Hesperomannia arbuscula, Hibiscus brackenridgei, Isodendrion laurifolium, Isodendrion longifolium, Labordia cyrtandrae, Lepidium arbuscula, Lipochaeta lobata* var. *leptophylla, Lipochaeta tenuifolia, Lobelia niihauensis, Melicope pallida, Neraudia angulata, Nototrichium humile, Peucedanum sandwicense, Phyllostegia hirsuta, Phyllostegia kaalaensis, Phyllostegia mollis, Plantago princeps, Sanicula mariversa, Schiedea hookeri, Schiedea kaalae, Schiedea kealiae, Schiedea nuttallii, Sesbania tomentosa, Silene lanceolata, Spermolepis hawaiiensis, Tetramolopium filiforme, Urera kaalae,* and *Viola chamissoniana* ssp. *chamissoniana.* It is proposed for designation because it contains the physical and biological features that are considered essential for their conservation on Oahu and provides habitat to support one or more of the 8 to 10 populations and 100 mature individuals per population for *Alectryon macrococcus, Colubrina oppositifolia, Flueggea neowawraea, Hesperomannia arborescens, Hesperomannia arbuscula, Melicope pallida, Schiedea nuttallii,* and *Vigna o-wahuensis;* or 300 mature individuals per population for *Abutilon sandwicense, Alsinidendron obovatum, Alsinidendron trinerve, Bonamia menzeisii, Cenchrus agrimonioides, Centaurium sebaeoides, Chamaesyce celastroides* var. *kaenana, Chamaesyce herbstii, Ctenitis squamigera, Cyanea acuminata, Cyanea grimesiana* ssp. *obatae, Cyanea longiflora, Cyanea superba, Cyperus trachysanthos, Cyrtandra dentata, Delissea subcordata, Diellia falcata, Dubautia herbstobatae, Eragrostis fosbergii, Eugenia koolauensis, Euphorbia haeleeleana, Gardenia mannii, Gouania meyenii, Gouania vitifolia, Hedyotis degeneri, Hedyotis parvula, Hibiscus brackenridgei, Isodendrion laurifolium, Isodendrion longifolium, Labordia cyrtandrae, Lepidium arbuscula, Lipochaeta lobata* var. *leptophylla, Lipochaeta tenuifolia, Lobelia niihauensis, Neraudia angulata, Nototrichium humile, Peucedanum sandwicense, Phyllostegia hirsuta, Phyllostegia kaalaensis, Phyllostegia mollis, Plantago princeps, Sanicula mariversa, Schiedea hookeri, Schiedea kaalae, Schiedea kealiae, Sesbania tomentosa, Silene lanceolata, Tetramolopium filiforme, Urera kaalae,* and *Viola chamissoniana* ssp. *chamissoniana;* or 500 mature individuals per population for *Spermolepis hawaiiensis,* throughout their known historical range considered by the recovery plans to be necessary for the conservation of each species. This unit also provides unoccupied habitat for seven species: *Diplazium molokaiense, Isodendrion pyrifolium, Mariscus pennatiformis, Solanum sandwicense, Stenogyne kaneohoana, Tetramolopium lepidotum* ssp. *lepidotum,* and *Vigna o-wahuense.* Designation of this unit is essential to the conservation of these species because it contains the physical and biological features that are considered essential for their conservation on Oahu, and provides habitat to support one or more additional populations necessary to meet the recovery objectives for these species of 8 to 10 populations and 100 mature individuals per population for *Vigna o-wahuense,* or 300 mature individuals per population for *Diplazium molokaiense, Isodendrion pyrifolium, Mariscus pennatiformis, Solanum sandwicense, Stenogyne kaneohoana,* and *Tetramolopium lepidotum* ssp. *lepidotum,* throughout their known historical range (see the discussion of conservation requirements in Section D, and in the table for Oahu A).

This unit contains a total of 8,503 ha (21,013 ac) on State (Kuaokala Game Management Area, Kaena Point Natural Area Reserve and State Park, Kaala Natural Area Reserve, Waianae Kai Forest Reserve, Makua Keauu Forest Reserve, Mokuleia Forest Reserve, and Pahole Natural Area Reserve), Federal (Makua Military Reservation, Schofield Barracks Military Reservation, and Dillingham Military Reservation), and private lands. The natural features found in this unit are Kaneana Cave, Manini Pali, Alei Pali, Kauhao Pali, Mahoe Pali, Peacock Flat, Kamaileunu

Ridge, Kaala, Kamaile Heiau summit, Kaupakuhale summit, Puu Pueo, Puu Iki, Puu Pane, Kamaohanui summit, Puu Kamaileunu, Puu Kawiwi, Puu Kepauala, Puu Keaau, Alau Gulch, Haili Gulch, Uluhulu Gulch, and Nihoa Gulch.

The following key should be used for critical habitat units Oahu A through Oahu X tables:

Key:

1. This unit is needed to meet the recovery plan objectives of 8 to 10 viable populations (self perpetuating and sustaining for at least 5 years) with 100 to 500 mature, reproducing individuals per species throughout its historical range as specified in the recovery plans.

2. Island endemic.

3. Multi-island species with current locations on other islands.

4. Multi-island species with no current locations on other islands.

5. Current locations do not necessarily represent viable populations with the required number of mature individuals.

6. Several current locations may be affected by one naturally occurring, catastrophic event.

7. Species with variable habitat requirements, usually over wide areas. Wide ranging species require more space per individual over more land area to provide needed primary constituent elements to maintain healthy population size.

8. Not all currently occupied habitat was determined to be essential to the recovery of the species.

9. Life history, long-lived perennial–100 mature, reproducing individuals per population.

10. Life history, short-lived perennial–300 mature, reproducing individuals per population.

11. Life history, annual–500 mature, reproducing individuals per population.

12. Narrow endemic, the species probably never naturally occurred in more than a single or a few populations.

13. Species has extremely restricted, specific habitat requirements.

14. Hybridization is possible so distinct populations of related species should not overlap, requiring more land area.

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Table for Oahu A

Species	Abutilon sandwicense	Alectryon macrococcus	Alsinidendron obovatum	Alsinidendron trinerve	Bonamia menziesii
1. 8–10 pop. guidelines	X	X *	X *	X *	X *
2. Island endemic.	X		X	X	
3. Multi-island/current other islands.		X			X
4. Multi-island/no current other islands.					
5. Non-viable populations.	X	X	X	X	X
6. Several occ. vulnerable to destruction	X	X	X	X	
7. Species with variable habitats.	X	X	X	X	X
8. Not all occupied habitat needed	X	X			X
9. Long-lived perennial–100/pop.		X			
10. Short-livedperennial–300/pop.	X		X	X	X
11. Annual–500/pop.					
12. Narrow endemic.				X	
13. Restricted habitat requirements					
14. Hybridization is possible.	X				
Notes		*Species is wide ranging, each island was probably one large, population.	*Not enough suitable habitat for 8 to 10 pops	*Not enough suitable habitat for 8 to 10 pops	*Species is wide ranging, each island was probably one large, population.

Cenchrus agrimonioides	X *		X		X	X	X		X			*Species is wide ranging, each island was probably one large, population.
Centaurium sebaeoides	X *		X		X	X				X	X**	*Species is wide ranging, each island was probably one large, population. **volcanic or clay soils
Chamaesyce celastroides var. kaenana	X *	X			X	X	X	X	X			*Not enough suitable habitat for 8 to 10 pops
Chamaesyce herbstii	X *	X			X	X	X		X			*Not enough suitable habitat for 8 to 10 pops
Colubrina oppositifolia	X *		X		X	X	X	X				*Species is wide ranging, each island was probably one large, population.
Ctenitis squamigera	X *		X		X	X	X		X			*Species is wide ranging, each island was probably one large, population.
Cyanea acuminata	X	X			X	X	X	X	X			
Cyanea grimesiana ssp. obatae	X	X			X	X	X		X			
Cyanea longiflora	X	X			X	X	X		X			
Cyanea superba	X *	X			X	X	X		X			*Not enough suitable habitat for 8 to 10 pops

Cyperus trachysanthos	X*		X		X					X			X**		*Species is wide ranging, each island was probably one large, population. **wet sites (mud flats, wet clay soil, seasonal ponds, or wet cliff seeps) on coastal cliffs or talus slopes
Cyrtandra dentata	X	X			X	X	X			X				X	
Delissea subcordata	X	X			X	X	X	X		X					
Diellia falcata	X*	X			X	X	X	X		X				X	*Species is wide ranging, each island was probably one large, population.
Diplazium molokaiense	X*		X**		X**					X			X***		*Species is wide ranging, each island was probably one large, population. **Historical on Oahu ***Steep rocky wooded gulch walls in wet forests.
Dubautia herbstobatae	X*	X			X	X	X			X				X	*Not enough suitable habitat for 8 to10 pops.
Eragrostis fosbergii	X*	X			X	X	X			X		X			*Species is wide ranging, each island was probably one large, population.

Eugenia koolauensis	X *			X	X	X	X		X					*Species is wide ranging, each island was probably one large, population.
Euphorbia haeleeleana	X *		X		X	X	X			X				*Species is wide ranging, each island was probably one large, population.
Flueggea neowawraea	X *		X		X	X	X	X	X					*Species is wide ranging, each island was probably one large, population.
Gardenia mannii	X *	X			X	X	X	X		X			X	*Species is wide ranging, each island was probably one large, population.
Gouania meyenii	X		X		X	X	X			X				
Gouania vitifolia	X *		X		X	X	X			X				*Species is wide ranging, each island was probably one large, population.
Hedyotis degeneri	X *	X			X	X				X			X**	*Not enough suitable habitat for 8 to 10 pops **Ridge crests.
Hedyotis parvula	X	X			X	X				X			X*	*On and at the base of cliff faces, rock outcrops, and ledges.
Hesperomannia arborescens	X *		X		X	X	X	X	X					*Species is wide ranging, each island was probably one large, population.

Hesperomannia arbuscula	X*		X		X	X	X		X						*Species is wide ranging, each island was probably one large, population.
Hibiscus brackenridgei	X*		X		X	X	X			X					*Species is wide ranging, each island was probably one large, population.
Isodendrion laurifolium	X		X		X	X	X			X				X	
Isodendrion longifolium	X		X		X	X	X			X				X	
Isodendrion pyrifolium	X		X*		X*		X			X					*Historical on Oahu
Labordia cyrtandrae	X	X			X	X	X			X					
Lepidium arbuscula	X	X			X	X		X		X			X*		*Exposed ridge tops and cliff faces.
Lipochaeta lobata var. leptophylla	X	X			X	X	X			X					
Lipochaeta tenuifolia	X	X			X	X		X		X			X*		*Ridgetops and bluffs.
Lobelia niihauensis	X*		X		X	X		X			X		X**		*Species is wide ranging, each island was probably one large, population. **Exposed mesic or dry cliffs and ledges.
Mariscus pennatiformis	X		X*		X*		X			X					*Historical on Oahu
Melicope pallida	X		X		X	X			X				X*		*Steep rock faces.
Neraudia angulata	X	X			X		X	X		X					

Nototrichium humile	X			X	X	X	X	X		X					
Peucedanum sandwicense	X *		X		X	X	X	X		X					*Species is wide ranging, each island was probably one large, population.
Phyllostegia hirsuta	X	X			X	X	X	X		X				X	
Phyllostegia kaalaensis	X	X			X	X	X			X				X	
Phyllostegia mollis	X		X		X	X	X	X		X				X	
Plantago princeps	X		X		X					X			X*		*Sides of waterfalls and wet rock faces.
Sanicula mariversa	X *	X			X	X	X			X					*Not enough suitable habitat for 8 to 10 pops
Schiedea hookeri	X *			X	X	X	X	X		X					*Not enough suitable habitat for 8 to 10 pops (not done on other island in historic range)
Schiedea kaalae	X	X			X	X	X	X		X					
Schiedea kealiae	X *	X			X	X				X		X	X** *		*Not enough suitable habitat for 8 to 10 pops **Steep slopes and cliff faces and bases in dry remnant Erythrina sandwicensis forest.
Schiedea nuttallii	X		X		X	X	X			X					
Sesbania tomentosa	X *		X		X	X	X	X		X					*Species is wide ranging, each island was probably one large, population.

Silene lanceolata	X		X		X	X				X			X*		*Cliff faces and ledges of gullies in dry to mesic shrubland and cliff communities.
Solanum sandwicense	X		X*										X**		*Historical on Oahu **Talus slopes and in streambeds in open, sunny areas.
Spermolepis hawaiiensis	X*		X		X	X					X		X**		*Species is wide ranging, each island was probably one large, population. **Steep–vertical cliffs or at the base of cliffs and ridges in coastal dry cliff vegetation.
Stenogyne kanehoana	X*	X			X	X	X			X					*Not enough suitable habitat for 8 to 10 pops
Tetramolopium filiforme	X*	X			X	X		X		X				X	*Not enough suitable habitat for 8 to 10 pops
Tetramolopium lepidotum ssp. lepidotum	X*			X	X	X	X	X		X				X	*Not enough suitable habitat for 8 to 10 pops (not done on other island in historic range)
Urera kaalae	X	X			X	X	X			X					

Vigna o–wahuensis	X *		X* *	X **				X		X* **		*Species is wide ranging, each island was probably one large, population. **Historical on Oahu ***Open dry fossil reef, climbing over shrubs and grasses on limestone deposit and on fairly steep slopes.
Viola chamissoniana ssp. chamissoniana	X	X		X	X	X	X		X			

Oahu B

The proposed unit Oahu B provides occupied habitat for three species: *Bonamia menzeisii, Euphorbia haeleeleana,* and *Nototrichium humile.* It is proposed for designation because it contains the physical and biological features that are considered essential for their conservation on Oahu, and provides habitat to support one or more of the 8 to 10 populations and 300 mature individuals per population for these species throughout their known historical range considered by the recovery plans to be necessary for the conservation of each species. This unit also provides unoccupied habitat for four species: *Gouania vitifolia, Hibiscus brackenridgei, Isodendrion pyrifolium,* and *Neraudia angulata.* Designation of this unit is essential to the conservation of these species because it contains the physical and biological features that are considered essential for their conservation on Oahu, and provides habitat to support one or more additional populations necessary to meet the recovery objectives for these species of 8 to 10 populations and 300 mature individuals per population throughout their known historical range (see the discussion of conservation requirements in Section D, and in the table for Oahu B).

This unit contains a total of 34 ha (83 ac) on State lands (Kuaokala Forest Reserve and Kaena Point State Park). The natural features found in this unit are the cliffs below Kuaokala Ridge.

Table for Oahu B

Species	Bonamia menziesii	Euphorbia haeleeleana	Gouania vitifolia	Hibiscus brackenridgei	Isodendrion pyrifolium	Neraudia angulata	Nototrichium humile
Notes	*Species is wide ranging, each island was probably one large, population.	*Species is wide ranging, each island was probably one large, population.	*Species is wide ranging, each island was probably one large, population.	*Species is wide ranging, each island was probably one large, population.	*Historical on Oahu		
14. Hybridization is possible.							
13. Restricted habitat requirements							
12. Narrow endemic.							
11. Annual–500/pop.							
10. Short-livedperennial–300/pop.	X	X	X	X	X	X	X
9. Long-lived perennial–100/pop.							
8. Not all occupied habitat needed	X					X	X
7. Species with variable habitats.	X	X	X	X	X	X	X
6. Several occ. vulnerable to destruction		X	X	X			X
5. Non-viable populations.	X	X	X	X	X *	X	X
4. Multi-island/no current other islands.							X
3. Multi-island/current other islands.	X	X	X	X	X*		
2. Island endemic.						X	
1. 8–10 pop. guidelines	X *	X *	X *	X *	X	X	X

Oahu C

The proposed unit Oahu C provides occupied habitat for one species: *Bonamia menzeisii*. It is proposed for designation because it contains the physical and biological features that are considered essential for its conservation on Oahu, and provides habitat to support one or more of the 8 to 10 populations and 300 mature individuals per population for *Bonamia menzeisii,* throughout its known historical range considered by the recovery plan to be necessary for the conservation of this species (see the discussion of conservation requirements in Section D, and in the table for Oahu C).

This unit contains a total of 14 ha (35 ac) on State lands (Kuaokala Forest Reserve and Kuaokala Game Management Area).

Table for Oahu C

Species	Bonamia menziesii
1. 8–10 pop. guidelines	X *
2. Island endemic.	
3. Multi-island/current other islands.	X
4. Multi-island/no current other islands.	
5. Non-viable populations.	X
6. Several occ. vulnerable to destruction	
7. Species with variable habitats.	X
8. Not all occupied habitat needed	X
9. Long-lived perennial–100/pop.	
10. Short-livedperennial–300/pop.	X
11. Annual–500/pop.	
12. Narrow endemic.	
13. Restricted habitat requirements	
14. Hybridization is possible.	
Notes	*Species is wide ranging, each island was probably one large, population.

Oahu D

The proposed unit Oahu D provides occupied habitat for five species: *Bonamia menzeisii, Euphorbia haeleeleana, Neraudia angulata, Nototrichium humile*, and *Schiedea hookeri*. It is proposed for designation because it contains the physical and biological features that are considered

essential for their conservation on Oahu, and provides habitat to support one or more of the 8 to 10 populations and 300 mature individuals per population for these species throughout their known historical range considered by the recovery plans to be necessary for the conservation of each species. This unit also provides unoccupied habitat for four species: *Chamesyce celastroides* var. *kaenana*, *Hibiscus brackenridgei, Isodendrion pyrifolium*, and *Gouania vitifolia*. Designation of this unit is essential to the conservation of these species because it contains the physical and biological features that are considered essential for their conservation on Oahu, and provides habitat to support one or more additional populations necessary to meet the recovery objectives for these species of 8 to 10 populations and 300 mature individuals per population for these species throughout their known historical range (see the discussion of conservation requirements in Section D, and in the table for Oahu D).

This unit contains a total of 110 ha (271 ac) on State (Kuaokala Forest Reserve and Kaena Point State Park) and Federal (Makua Military Reservation) lands. The natural features found in this unit are Kaluakauila Stream and Punapohaku Stream.

Table for Oahu D

Species	Bonamia menziesii	Chamaesyce celastroides var. kaenana	Euphorbia haeleeleana	Gouania vitifolia
1. 8–10 pop. guidelines	X *	X *	X *	X *
2. Island endemic.		X		
3. Multi-island/current other islands.	X		X	X
4. Multi-island/no current other islands.				
5. Non-viable populations.	X	X	X	X
6. Several occ. vulnerable to destruction		X	X	X
7. Species with variable habitats.	X	X	X	X
8. Not all occupied habitat needed	X	X		
9. Long-lived perennial–100/pop.				
10. Short-livedperennial–300/pop.	X	X	X	X
11. Annual–500/pop.				
12. Narrow endemic.				
13. Restricted habitat requirements				
14. Hybridization is possible.				
Notes	*Species is wide ranging, each island was probably one large, population.	*Not enough suitable habitat for 8 to 10 pops	*Species is wide ranging, each island was probably one large, population.	*Species is wide ranging, each island was probably one large, population.

Hibiscus brackenridgei	X *		X		X	X	X		X				*Species is wide ranging, each island was probably one large, population.
Isodendrion pyrifolium	X		X*		X *		X		X				*Historical on Oahu
Neraudia angulata	X	X			X		X	X		X			
Nototrichium humile	X			X	X	X	X	X	X				
Schiedea hookeri	X *			X	X	X	X	X	X				*Not enough suitable habitat for 8 to 10 pops (not done on other island in historic range)

Oahu E

The proposed unit Oahu E provides occupied habitat for one species: *Chamaesyce kuwaleana*. It is proposed for designation because it contains the physical and biological features that are considered essential for its conservation on Oahu, and provides habitat to support one or more of the 8 to 10 populations and 300 mature individuals per population, throughout its known historical range considered by the recovery plan to be necessary for the conservation of the species (see the discussion of conservation requirements in Section D, and in the table for Oahu E).

This unit contains a total of 38 ha (94 ac) on State land. The natural features found in this unit are Mauna Kuwale and Paheehee Ridge.

Table for Oahu E

Species	Chamaesyce kuwaleana
1. 8–10 pop. guidelines	X *
2. Island endemic.	X
3. Multi-island/current other islands.	
4. Multi-island/no current other islands.	
5. Non-viable populations.	X
6. Several occ. vulnerable to destruction	X
7. Species with variable habitats.	X
8. Not all occupied habitat needed	
9. Long-lived perennial–100/pop.	
10. Short-livedperennial–300/pop.	X
11. Annual–500/pop.	
12. Narrow endemic.	
13. Restricted habitat requirements	
14. Hybridization is possible.	
Notes	*Not enough suitable habitat for 8 to 10 pops

Oahu F

The proposed unit Oahu F provides occupied habitat for one species: *Chamaesyce kuwaleana*. It is proposed for designation because it contains the physical and biological features that are considered essential for its conservation on Oahu, and provides habitat to support one or more of the 8 to 10 populations and 300 mature individuals per population, throughout its known historical range considered by the recovery plan to be necessary for the conservation of the species. This unit also provides unoccupied habitat for one species: *Isodendrion pyrifolium*. Designation of this unit is essential to the conservation of this species because it contains the physical and biological features that are considered essential for its conservation on Oahu, and provides habitat to support one or more additional populations necessary to meet the recovery objectives for this species of 8 to 10 populations and 300 mature individuals throughout its known historical range (see the discussion of conservation requirements in Section D, and in the table for Oahu F).

This unit contains a total of 81 ha (200 ac) on State (Waianae Kai Forest Reserve) and Federal (Lualualei Naval Magazine) lands. The natural feature found in this unit is Kauaopuu.

Table for Oahu F

Species	Chamaesyce kuwaleana	Isodendrion pyrifolium
1. 8–10 pop. guidelines	X *	X
2. Island endemic.	X	
3. Multi-island/current other islands.		X*
4. Multi-island/no current other islands.		
5. Non-viable populations.	X	X *
6. Several occ. vulnerable to destruction	X	
7. Species with variable habitats.	X	X
8. Not all occupied habitat needed		
9. Long-lived perennial–100/pop.		
10. Short-livedperennial–300/pop.	X	X
11. Annual–500/pop.		
12. Narrow endemic.		
13. Restricted habitat requirements		
14. Hybridization is possible.		
Notes	*Not enough suitable habitat for 8 to 10 pops	*Historical on Oahu

Oahu G

The proposed unit Oahu G provides occupied habitat for two species: *Tetramolopium filiforme* and *Viola chamissoniana* ssp. *chamissoniana*. It is proposed for designation because it contains the physical and biological features that are considered essential for their conservation on Oahu, and provides habitat to support one or more of the 8 to 10 populations and 300 mature individuals per population for these species throughout their known historical range considered by the recovery plans to be necessary for the conservation of each species (see the discussion of conservation requirements in Section D, and in the table for Oahu G).

This unit contains a total of 16 ha (40 ac) on Federal land (Lualualei Naval Magazine and Schofield Barracks Military Reservation). The natural feature found in this unit is Puu Ku Makalii.

Table for Oahu G

Species	Tetramolopium filiforme	Viola chamissoniana ssp. chamissoniana
1. 8–10 pop. guidelines	X *	X
2. Island endemic.	X	X
3. Multi-island/current other islands.		
4. Multi-island/no current other islands.		
5. Non-viable populations.	X	X
6. Several occ. vulnerable to destruction	X	X
7. Species with variable habitats.		X
8. Not all occupied habitat needed	X	X
9. Long-lived perennial–100/pop.		
10. Short-livedperennial–300/pop.	X	X
11. Annual–500/pop.		
12. Narrow endemic.		
13. Restricted habitat requirements		
14. Hybridization is possible.	X	
Notes	*Not enough suitable habitat for 8 to 10 pops	

Oahu H

The proposed unit Oahu H provides occupied habitat for one species: *Chamaesyce kuwaleana*. It is proposed for designation because it contains the physical and biological features that are considered essential for its conservation on Oahu, and provides habitat to support one or more of the 8 to 10 populations and 300 mature individuals per population, throughout its known historical range considered by the recovery plan to be necessary for the conservation of the species (see the discussion of conservation requirements in Section D, and in the table for Oahu H).

This unit contains a total of 28 ha (68 ac) on Federal land (Lualualei Naval Magazine). The natural feature found in this unit is Puu Kailio.

Table for Oahu H

Species	Notes
Chamaesyce kuwaleana	1. 8–10 pop. guidelines X *
	2. Island endemic. X
	3. Multi-island/current other islands.
	4. Multi-island/no current other islands.
	5. Non-viable populations. X
	6. Several occ. vulnerable to destruction X
	7. Species with variable habitats. X
	8. Not all occupied habitat needed
	9. Long-lived perennial–100/pop.
	10. Short-livedperennial–300/pop. X
	11. Annual–500/pop.
	12. Narrow endemic.
	13. Restricted habitat requirements
	14. Hybridization is possible.
	*Not enough suitable habitat for 8 to 10 pops

Oahu I

The proposed unit Oahu I provides occupied habitat for 32 species: *Abutilon sandwicense, Alectryon macrococcus, Bonamia menzeisii, Cenchrus agrimonioides, Chamaesyce herbstii, Cyanea grimesiana* ssp. *obatae, Cyrtandra dentata, Delissea subcordata, Diellia falcata, Diellia unisora, Fluggea neowawraea, Gardenia mannii, Hedyotis parvula, Hesperomannia arbuscula, Lepidium arbuscula, Lipochaeta lobata* var. *leptophylla, Lobelia niihauensis, Melicope saint-johnii, Neraudia angulata, Phyllostegia hirsuta, Phyllostegia kaalaensis, Phyllostegia mollis, Phyllostegia parviflora, Plantago princeps, Sanicula mariversa, Schiedea hookeri, Schiedea kaalae, Schiedea nuttallii, Stenogyne kanehoana, Tetramolopium lepidotum* ssp. *lepidotum, Urera kaalae,* and *Viola chamissoniana* ssp. *chamissoniana.* It is proposed for designation because it contains the physical and biological features that are considered essential for their conservation on Oahu, and provides habitat to support one or more of the 8 to 10 populations and 100 mature individuals per population for *Alectryon macrococcus, Flueggea neowawraea, Hesperomannia arbuscula, Melicope saint-johnii,* and *Schiedea nuttallii;* or 300 mature individuals per population for *Abutilon sandwicense, Bonamia menzeisii, Cenchrus agrimonioides, Chamaesyce herbstii, Cyanea grimesiana* ssp. *obatae, Cyrtandra dentata, Delissea subcordata, Diellia falcata, Diellia unisora, Gardenia mannii, Hedyotis parvula, Lepidium arbuscula, Lipochaeta lobata* var. *leptophylla, Lobelia niihauensis, Neraudia angulata, Phyllostegia hirsuta, Phyllostegia kaalaensis, Phyllostegia mollis, Phyllostegia parviflora, Plantago princeps, Sanicula mariversa, Schiedea hookeri, Schiedea kaalae, Stenogyne kanehoana, Tetramolopium lepidotum* ssp. *lepidotum, Urera kaalae,* and *Viola chamissoniana* ssp. *chamissoniana,* throughout their known historical range considered by the recovery plans to be necessary for the conservation of each species. This unit also provides unoccupied habitat for 10 species: *Alsinidendron obovatum, Chamaesyce kuwaleana, Cyanea pinnatifida, Gouania meyenii, Hedyotis coriacea, Hibiscus brackenridgei, Isondendrion pyrifolium, Melicope pallida, Silene perlmanii, and Solanum sandwicense.* Designation of this unit is essential to the conservation of these species because it contains the physical and biological features that are considered essential for their conservation on Oahu, and provides habitat to support one or more additional populations necessary to meet the recovery objectives for these species of 8 to 10 populations and 100 mature individuals per population for *Melicope pallida;* or 300 mature individuals per population for *Alsinidendron obovatum, Chamaesyce kuwaleana, Cyanea pinnatifida, Gouania meyenii, Hedyotis coriacea, Hibiscus brackenridgei, Isondendrion pyrifolium, Silene perlmanii,* and *Solanum sandwicense,* throughout their known historical range (see the discussion of conservation requirements in Section D, and in the table for Oahu I).

This unit contains a total of 5,109 ha (12,623 ac) on State (Nanakuli Forest Reserve), Federal (Lualualei Naval Magazine and Schofield Barracks Military Reservation), City and County of Honolulu, and private (Honouliuli Preserve) lands. The natural features found in this unit are Pohakea Pass, Akupu, Palehua, Palikea Ridge, Maunauna summit, Palikea summit, Mauna Kapu, Puu Heleakala, Puu Kaua, Puu Hapapa, Puu Kuua, Puu Kanehoa, Puu Manawahua, Puu Poulihale, and Puu Moopuna.

Table for Oahu I

Species					
Abutilon sandwicense	X				
Alectryon macrococcus	X *	X		X	X
Alsinidendron obovatum	X *		X		
Bonamia menziesii	X *	X		X	X
Cenchrus agrimonioides	X *	X		X	X
1. 8–10 pop. guidelines	X				
2. Island endemic.	X		X		
3. Multi-island/current other islands.		X		X	X
4. Multi-island/no current other islands.					
5. Non-viable populations.	X	X	X	X	X
6. Several occ. vulnerable to destruction	X	X	X		X
7. Species with variable habitats.	X	X	X	X	X
8. Not all occupied habitat needed	X	X		X	
9. Long-lived perennial–100/pop.		X			
10. Short-livedperennial–300/pop.	X		X	X	X
11. Annual–500/pop.					
12. Narrow endemic.					
13. Restricted habitat requirements					
14. Hybridization is possible.	X				
Notes		*Species is wide ranging, each island was probably one large, population.	*Not enough suitable habitat for 8 to 10 pops	*Species is wide ranging, each island was probably one large, population.	*Species is wide ranging, each island was probably one large, population.

Chamaesyce herbstii	X *	X			X	X	X			X				*Not enough suitable habitat for 8 to 10 pops
Chamaesyce kuwaleana	X *	X			X	X	X			X				*Not enough suitable habitat for 8 to 10 pops
Cyanea grimesiana ssp. obatae	X	X			X	X	X			X				
Cyanea pinnatifida	X *	X			X **		X			X				*Not enough suitable habitat for 8 to 10 pops **Extirpated in wild but genetic material available
Cyrtandra dentata	X	X			X	X	X			X				X	
Delissea subcordata	X	X			X	X	X	X		X					
Diellia falcata	X *	X			X	X	X	X		X				X	*Species is wide ranging, each island was probably one large, population.
Diellia unisora	X *	X			X	X	X			X				X	*Species is wide ranging, each island was probably one large, population.
Flueggea neowawraea	X *		X		X	X	X	X	X						*Species is wide ranging, each island was probably one large, population.
Gardenia mannii	X *	X			X	X	X	X		X				X	*Species is wide ranging, each island was probably one large, population.
Gouania meyenii	X		X		X	X	X			X					

Hedyotis coriacea	X		X*		X*					X			X**		*Historical on Oahu **Steep, rocky, slopes.
Hedyotis parvula	X	X			X	X				X			X*		*On and at the base of cliff faces, rock outcrops, and ledges.
Hesperomannia arbuscula	X*		X		X	X	X		X						*Species is wide ranging, each island was probably one large, population.
Hibiscus brackenridgei	X*		X		X	X	X			X					*Species is wide ranging, each island was probably one large, population.
Isodendrion pyrifolium	X		X*		X*		X			X					*Historical on Oahu
Lepidium arbuscula	X	X			X	X		X		X			X*		*Exposed ridge tops and cliff faces.
Lipochaeta lobata var. leptophylla	X	X			X	X	X			X					
Lobelia niihauensis	X*		X		X	X		X			X		X**		*Species is wide ranging, each island was probably one large, population. **Exposed mesic or dry cliffs and ledges.
Melicope pallida	X		X		X	X			X				X*		*Steep rock faces.
Melicope saint-johnii	X*	X			X	X	X		X						*Species is wide ranging, each island was probably one large, population.
Neraudia angulata	X	X			X		X	X		X					

Phyllostegia hirsuta	X	X		X	X	X	X					X		
Phyllostegia kaalaensis	X	X		X	X	X		X					X	
Phyllostegia mollis	X		X	X	X	X	X	X					X	
Phyllostegia parviflora	X *			X	X	X		X					X	*Not enough suitable habitat for 8 to 10 pops (not done on other island in historic range)
Plantago princeps	X		X		X			X				X*		*Sides of waterfalls and wet rock faces.
Sanicula mariversa	X *	X			X	X		X						*Not enough suitable habitat for 8 to 10 pops
Schiedea hookeri	X *			X	X	X	X	X						*Not enough suitable habitat for 8 to 10 pops (not done on other island in historic range)
Schiedea kaalae	X	X			X	X	X	X						
Schiedea nuttallii	X		X		X	X		X						
Silene perlmanii	X *	X *			X *			X		X		X* *		*Not enough suitable habitat for 8 to 10 pops **Extirpated but genetic material available. ***Steep rocky slopes.
Solanum sandwicense	X		X*									X* *		*Historical on Oahu **Talus slopes and in streambeds in open, sunny areas.
Stenogyne kanehoana	X *	X			X	X		X						*Not enough suitable habitat for 8 to 10 pops
Tetramolopium lepidotum ssp. lepidotum	X *			X	X	X	X	X					X	*Not enough suitable habitat for 8 to 10 pops (not done on other island in historic range)
Urera kaalae	X	X			X	X		X						
Viola chamissoniana ssp. chamissoniana	X	X			X	X	X	X						

Oahu J

The proposed unit Oahu J provides occupied habitat for one species: *Marsilea villosa.* It is proposed for designation because it contains the physical and biological features that are considered essential for its conservation on Oahu, and provides habitat to support one or more of the 6 populations throughout its known historical range considered by the recovery plan to be necessary for the conservation of the species (see the discussion of conservation requirements in Section D, and in the table for Oahu J).

This unit contains a total of 10 ha (25 ac) on Federal land (Lualualei Naval Magazine).

Table for Oahu J

Species	Notes
Marsilea villosa	*Recovery goal is 6 populations **Seasonal wetlands in cinder craters, vernal pools surrounded by lowland dry forest vegetation, mud flats, and lowland grasslands.
1. 8–10 pop. guidelines	X *
2. Island endemic.	
3. Multi-island/current other islands.	X
4. Multi-island/no current other islands.	
5. Non-viable populations.	X
6. Several occ. vulnerable to destruction	X
7. Species with variable habitats.	
8. Not all occupied habitat needed	
9. Long-lived perennial–100/pop.	
10. Short-livedperennial–300/pop.	
11. Annual–500/pop.	X
12. Narrow endemic.	
13. Restricted habitat requirements	X**
14. Hybridization is possible.	

Oahu K

The proposed unit Oahu K provides occupied habitat for one species: *Marsilea villosa.* It is proposed for designation because it contains the physical and biological features that are considered essential for its conservation on Oahu, and provides habitat to support one or more of the 6 populations throughout its known historical range considered by the recovery plan to be necessary for the conservation of the species (see the discussion of conservation requirements in Section D, and in the table for Oahu K).

This unit contains a total of 7 ha (18 ac) on Federal land (Lualualei Naval Magazine).

Table for Oahu K

Species	Notes
Marsilea villosa	*Recovery goal is 6 populations. **Seasonal wetlands in cinder craters, vernal pools surrounded by lowland dry forest vegetation, mud flats, and lowland grasslands.
1. 8–10 pop. guidelines	X *
2. Island endemic.	
3. Multi-island/current other islands.	X
4. Multi-island/no current other islands.	
5. Non-viable populations.	X
6. Several occ. vulnerable to destruction	X
7. Species with variable habitats.	
8. Not all occupied habitat needed	
9. Long-lived perennial–100/pop.	
10. Short-livedperennial–300/pop.	
11. Annual–500/pop.	X
12. Narrow endemic.	
13. Restricted habitat requirements	X**
14. Hybridization is possible.	

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Oahu L

The proposed unit Oahu L provides occupied habitat for 35 species: *Bonamia menzeisii, Chamaesyce deppeana, Chamaesyce rockii, Cyanea acuminata, Cyanea crispa, Cyanea grimesiana* ssp. *grimesiana, Cyanea humbotiana, Cyanea koolauensis, Cyanea st.-johnii, Cyanea truncata, Cyrtandra dentata, Cyrtandra polyantha, Cyrtandra subumbellata, Cyrtandra viridiflora, Diellia erecta, Eugenia koolauensis, Gardenia mannii, Hesperomannia arborescens, Isodendrion longifolium, Labordia cyrtandrae, Lobelia gaudichaudii* ssp. *koolauensis, Lobelia monostachya, Lysimachia filifolia, Melicope lydgatei, Myrsine juddii, Phlegmariurus nutans, Phyllostegia hirsuta, Phyllostegia parviflora, Plantago princeps, Pteris lydgatei, Sanicula purpurea, Schiedea kaalae, Tetraplasandra gymnocarpa, Trematalobelia singularis,* and *Viola oahuensiis.* It is proposed for designation because it contains the physical and biological features that are considered essential for their conservation on Oahu, and provides habitat to support one or more of the 8 to 10 populations and 100 mature individuals per population for *Hesperomannia arborescens, Melicope lydgatei,* and *Tetraplasandra gymnocarpa;* or 300 mature individuals per population for *Bonamia menzeisii, Chamaesyce deppeana, Chamaesyce rockii, Cyanea acuminata, Cyanea crispa, Cyanea grimesiana* ssp. *grimesiana, Cyanea humbotiana, Cyanea koolauensis, Cyanea st.-johnii, Cyanea truncata, Cyrtandra dentata, Cyrtandra polyantha, Cyrtandra subumbellata, Cyrtandra viridiflora, Diellia erecta, Eugenia koolauensis, Gardenia mannii, Isodendrion longifolium, Labordia cyrtandrae, Lobelia gaudichaudii* ssp. *koolauensis, Lobelia monostachya, Lysimachia filifolia, Myrsine juddii, Phlegmariurus nutans, Phyllostegia hirsuta, Phyllostegia parviflora, Plantago princeps, Pteris lydgatei, Sanicula purpurea, Schiedea kaalae, Trematalobelia singularis,* and *Viola oahuensiis,* throughout their known historical range considered by the recovery plans to be necessary for the conservation of each species. This unit also provides unoccupied habitat for 10 species: *Adenophorus periens, Chamaesyce celastroides* var. *kaenana, Cyanea longiflora, Cyanea superba, Delissea subcordata, Hedyotis coriacea, Isodendrion laurifolium, Lobelia oahuensis, Platanthera holochila,* and *Solanum sandwicense.* Designation of this unit is essential to the conservation of these species because it contains the physical and biological features that are considered essential for their conservation on Oahu, and provides habitat to support one or more additional populations necessary to meet the recovery objectives for these species of 8 to 10 populations and 300 mature individuals per population for these species throughout their known historical range (see the discussion of conservation requirements in Section D, and in the table for Oahu L).

This unit contains a total of 30,068 ha (74,301 ac) on State (Pupukea-Paumalu Forest Reserve, Hauula Forest Reserve, Sacred Falls State Park, Kaipapau Forest Reserve, Kahana Valley State Park, Ewa Forest Reserve, Waiahole Forest Reserve, Kaneohe Forest Reserve, Keaiwa Heiau State Recreation Area, Honolulu Watershed Forest Reserve, Kuliouou Forest Reserve, and Waahila Ridge State Park), Federal (Fort Shafter, Oahu Forest National Wildlife Refuge, Schofield Barracks Military Reservation, Kawailoa Training Area, and Kahuku Training Area), City and County of Honolulu, and private lands. The natural features found in this unit are Nuuanu Pali, Kaau Crater, Waipuhia Falls, Sacred Falls, Manoa Falls, Pauoa Flats, Waahila Ridge, Kulepiamoa Ridge, Mauumae Ridge, Kaumala Ridge, Wiliwilinui Ridge, Waiakeakua Stream, Naniuapo Stream, Waaloa Stream, Luaalaea Stream, Konahuanui summit, Mount Kawela, Kainawaaunui summit, Nanaikaalaea summit, Napuumaia summit, Puu Kaaumakua, Palikea summit, Puu Kainapuaa, Puu Kamana, Puu Kapu, Puu Kawipoo, Puu Keahia Kahoe, Puu Lanihuli, Puu Lanipo, Puu Nukohe, Puu o Kona, Puu Pauao, Puu Peahinaia, Puu Pia, Puu Uau, Puu Kahuauli, Eleao summit, Ulimakoli summit, Mount Olympus, and Laulaupoe Gulch.

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Table for Oahu L

Species	Adenophorus periens	Bonamia menziesii	Chamaesyce celastroides var. kaenana	Chamaesyce deppeana
1. 8–10 pop. guidelines	X *	X *	X *	X *
2. Island endemic.			X	X
3. Multi-island/current other islands.	X* *	X		
4. Multi-island/no current other islands.				
5. Non-viable populations.	X **	X	X	X
6. Several occ. vulnerable to destruction			X	X
7. Species with variable habitats.		X	X	X
8. Not all occupied habitat needed		X	X	
9. Long-lived perennial–100/pop.				
10. Short-livedperennial–300/pop.	X	X	X	X
11. Annual–500/pop.				
12. Narrow endemic.				
13. Restricted habitat requirements	X* **			
14. Hybridization is possible.				
Notes	*Species is wide ranging, each island was probably one large, population. **Historical on Oahu ***epiphytically on trees	*Species is wide ranging, each island was probably one large, population.	*Not enough suitable habitat for 8 to 10 pops	*Not enough suitable habitat for 8 to 10 pops

Chamaesyce rockii	X	X			X	X	X	X		X					
Cyanea acuminata	X	X			X	X	X	X		X					
Cyanea crispa	X	X			X	X	X	X		X					
Cyanea grimesiana ssp. grimesiana	X *		X		X	X	X	X		X					*Species is wide ranging, each island was probably one large, population.
Cyanea humboltiana	X	X			X	X	X	X		X					
Cyanea koolauensis	X	X			X	X	X			X					
Cyanea longiflora	X	X			X	X	X			X					
Cyanea st.-johnii	X	X			X	X	X			X					
Cyanea superba	X *	X			X	X	X			X					*Not enough suitable habitat for 8 to 10 pops
Cyanea truncata	X	X			X	X	X			X					
Cyrtandra dentata	X	X			X	X	X			X				X	
Cyrtandra polyantha	X *	X			X	X	X			X				X	*Not enough suitable habitat for 8 to 10 pops
Cyrtandra subumbellata	X *	X			X	X	X			X				X	*Not enough suitable habitat for 8 to 10 pops
Cyrtandra viridiflora	X	X			X	X		X		X			X*	X	*Wind-blown ridge tops in cloud-covered wet forest.
Delissea subcordata	X	X			X	X	X	X		X					

Diellia erecta	X*		X		X	X	X			X				*Species is wide ranging, each island was probably one large, population.
Eugenia koolauensis	X*			X	X	X	X		X					*Species is wide ranging, each island was probably one large, population.
Gardenia mannii	X*	X			X	X	X	X		X			X	*Species is wide ranging, each island was probably one large, population.
Hedyotis coriacea	X		X*		X*					X			X**	*Historical on Oahu **Steep, rocky, slopes.
Hesperomannia arborescens	X*		X		X	X	X	X	X					*Species is wide ranging, each island was probably one large, population.
Isodendrion laurifolium	X		X		X	X	X			X			X	
Isodendrion longifolium	X		X		X	X	X			X			X	
Labordia cyrtandrae	X	X			X	X	X			X				
Lobelia gaudichaudii ssp. koolauensis	X	X			X	X	X			X				
Lobelia monostachya	X	X			X	X			X				X*	*Steep, sparsely vegetated cliffs in mesic shrubland.
Lysimachia filifolia	X		X		X	X				X			X*	*Mossy banks at the base of cliff faces within the spray zone of waterfalls or along streams.

Melicope lydgatei	X*	X			X	X	X	X	X						*Species is wide ranging, each island was probably one large, population.
Myrsine juddii	X	X			X	X	X		X						
Phlegmariurus nutans	X*			X	X	X				X			X**		*Species is wide ranging, each island was probably one large, population. **Tree trunks
Phyllostegia hirsuta	X	X			X	X	X	X		X				X	
Phyllostegia parviflora	X*			X	X	X	X			X				X	*Not enough suitable habitat for 8 to 10 pops (not done on other island in historic range)
Plantago princeps	X		X		X					X			X*		*Sides of waterfalls and wet rock faces.
Platanthera holochila	X		X*		X*		X			X					*Historical on Oahu
Pteris lydgatei	X*		X		X	X				X			X*		*Species is wide ranging, each island was probably one large, population. **Steep stream banks and cliffs.
Sanicula purpurea	X		X		X					X			X*		*Open Metrosideros polymorpha mixed montane bogs and windswept shrublands within the cloud zone.

Schiedea kaalae	X	X		X	X	X	X		X				
Solanum sandwicense	X		X*								X* *		*Historical on Oahu **Talus slopes and in streambeds in open, sunny areas.
Tetraplasandra gymnocarpa	X *	X			X	X	X	X					*Species is wide ranging, each island was probably one large, population.
Trematalobelia singularis	X	X			X				X			X *	
Viola oahuensis	X	X			X	X	X		X				

Oahu M

The proposed unit Oahu M provides unoccupied habitat for two species: *Centaurium sebaeoides* and *Sesbania tomentosa*. Designation of this unit is essential to the conservation of these species because it contains the physical and biological features that are considered essential for their conservation on Oahu, and provides habitat to support one or more additional populations necessary to meet the recovery objectives for these species of 8 to 10 populations and 300 mature individuals per population throughout their known historical range (see the discussion of conservation requirements in Section D, and in the table for Oahu M).

This unit contains a total of 100 ha (246 ac) on State (Malaekahana State Recreation Area), Federal (James Campbell National Wildlife Refuge), and private lands. The natural feature found in this unit is the coastline from Kahuku Point to Makahoa Point.

Table for Oahu M

Species	Centaurium sebaeoides	Sesbania tomentosa
1. 8–10 pop. guidelines	X *	X *
2. Island endemic.		
3. Multi-island/current other islands.	X	X
4. Multi-island/no current other islands.		
5. Non-viable populations.	X	X
6. Several occ. vulnerable to destruction	X	X
7. Species with variable habitats.		X
8. Not all occupied habitat needed		X
9. Long-lived perennial–100/pop.		
10. Short-livedperennial–300/pop.		X
11. Annual–500/pop.	X	
12. Narrow endemic.		
13. Restricted habitat requirements	X* *	
14. Hybridization is possible.		
Notes	*Species is wide ranging, each island was probably one large, population. **volcanic or clay soils	*Species is wide ranging, each island was probably one large, population.

Oahu N

The proposed unit Oahu N provides unoccupied habitat for two species: *Centaurium sebaeoides* and *Sesbania tomentosa*. Designation of this unit is essential to the conservation of these species because it contains the physical and biological features that are considered essential for their conservation on Oahu, and provides habitat to support one or more additional populations necessary to meet the recovery objectives for these species of 8 to 10 populations and 300 mature individuals per population throughout their known historical range (see the discussion of conservation requirements in Section D, and in the table for Oahu N).

This unit contains a total of 5 ha (12 ac) on State lands. This unit is the Mokuauia Island State Seabird Sanctuary.

Table for Oahu N

Species	Centaurium sebaeoides	Sesbania tomentosa
1. 8–10 pop. guidelines	X *	X *
2. Island endemic.		
3. Multi-island/current other islands.	X	X
4. Multi-island/no current other islands.		
5. Non-viable populations.	X	X
6. Several occ. vulnerable to destruction	X	X
7. Species with variable habitats.		X
8. Not all occupied habitat needed		X
9. Long-lived perennial–100/pop.		
10. Short-livedperennial–300/pop.		X
11. Annual–500/pop.	X	
12. Narrow endemic.		
13. Restricted habitat requirements	X* *	
14. Hybridization is possible.		
Notes	*Species is wide ranging, each island was probably one large, population. **volcanic or clay soils	*Species is wide ranging, each island was probably one large, population.

Oahu O

The proposed unit Oahu O provides occupied habitat for three species: *Cyanea crispa, Cyanea truncata,* and *Schiedea kaalae.* It is proposed for designation because it contains the physical and biological features that are considered essential for their conservation on Oahu, and provides habitat to support one or more of the 8 to 10 populations and 300 mature individuals per population for each species throughout their known historical range considered by the recovery plans to be necessary for the conservation of each species (see the discussion of conservation requirements in Section D, and in the table for Oahu O).

This unit contains a total of 431 ha (1,066 ac) on State (Kahana Valley State Park) and private lands. The natural features found in this unit are Puu Manamana and Secret Valley.

Table for Oahu O

Species	Cyanea crispa	Cyanea truncata	Schiedea kaalae
1. 8–10 pop. guidelines	X	X	X
2. Island endemic.	X	X	X
3. Multi-island/current other islands.			
4. Multi-island/no current other islands.			
5. Non-viable populations.	X	X	X
6. Several occ. vulnerable to destruction	X	X	X
7. Species with variable habitats.	X	X	X
8. Not all occupied habitat needed	X		X
9. Long-lived perennial–100/pop.			
10. Short-livedperennial–300/pop.	X	X	X
11. Annual–500/pop.			
12. Narrow endemic.			
13. Restricted habitat requirements			
14. Hybridization is possible.			
Notes			

Oahu P

The proposed unit Oahu P provides occupied habitat for three species: *Bonamia menzeisii, Euphorbia haeleeleana,* and *Nototrichium humile.* It is proposed for designation because it contains the physical and biological features that are considered essential for their conservation on Oahu, and provides habitat to support one or more of the 8 to 10 populations and 300 mature individuals per population for

each species throughout their known historical range considered by the recovery plans to be necessary for the conservation of each species. This unit also provides unoccupied habitat for three species: *Gouania vitifolia, Hibiscus brackenridgei,* and *Isodendrion pyrifolium.* Designation of this unit is essential to the conservation of these species because it contains the physical and biological features that are considered essential for their conservation on Oahu, and provides habitat to support one or more additional populations necessary to meet the recovery objectives for these species of 8 to 10 populations and 300 mature individuals per population throughout their known historical range (see the discussion of conservation requirements in Section D, and in the table for Oahu P).

This unit contains a total of 2 ha (3 ac) on City and County of Honolulu land. This unit is Mokolii Island (Chinaman's Hat), part of Kualoa Regional Park.

Table for Oahu P

Species	1. 8–10 pop. guidelines	2. Island endemic.	3. Multi-island/current other islands.	4. Multi-island/no current other islands.	5. Non-viable populations.	6. Several occ. vulnerable to destruction	7. Species with variable habitats.	8. Not all occupied habitat needed	9. Long-lived perennial–100/pop.	10. Short-livedperennial–300/pop.	11. Annual–500/pop.	12. Narrow endemic.	13. Restricted habitat requirements	14. Hybridization is possible.	Notes
Bonamia menziesii	X *		X		X		X	X		X					*Species is wide ranging, each island was probably one large, population.
Euphorbia haeleeleana	X *		X		X	X	X			X					*Species is wide ranging, each island was probably one large, population.
Gouania vitifolia	X *		X		X	X	X			X					*Species is wide ranging, each island was probably one large, population.
Hibiscus brackenridgei	X *		X		X	X	X			X					*Species is wide ranging, each island was probably one large, population.
Isodendrion pyrifolium	X		X*		X *		X			X					*Historical on Oahu
Nototrichium humile	X			X	X	X	X	X		X					

Oahu Q

The proposed unit Oahu Q provides unoccupied habitat for one species: *Sesbania tomentosa.* Designation of this unit is essential to the conservation of this species because it contains the physical and biological features that are considered essential for its conservation on Oahu, and provides habitat to support one or more additional populations necessary to meet the recovery objectives for *Sesbania tomentosa* of 8 to 10 populations and 300 mature individuals per population throughout its known historical range (see the discussion of conservation requirements in Section D, and in the table for Oahu Q).

This unit contains a total of 1 ha (3 ac) on State land. This unit is a portion of the Moku Manu State Seabird Sanctuary.

Table for Oahu Q

Species	Sesbania tomentosa
1. 8–10 pop. guidelines	X *
2. Island endemic.	
3. Multi-island/current other islands.	X
4. Multi-island/no current other islands.	
5. Non-viable populations.	X
6. Several occ. vulnerable to destruction	X
7. Species with variable habitats.	X
8. Not all occupied habitat needed	X
9. Long-lived perennial–100/pop.	
10. Short-livedperennial–300/pop.	X
11. Annual–500/pop.	
12. Narrow endemic.	
13. Restricted habitat requirements	
14. Hybridization is possible.	
Notes	*Species is wide ranging, each island was probably one large, population.

Oahu R

The proposed unit Oahu R provides unoccupied habitat for two species: *Chamaesyce kuwaleana* and *Sesbania tomentosa*. Designation of this unit is essential to the conservation of these species because it contains the physical and biological features that are considered essential for their conservation on Oahu, and provides habitat to support one or more additional populations necessary to meet the recovery objectives for these species of 8 to 10 populations and 300 mature individuals per population throughout their known historical range (see the discussion of conservation requirements in Section D, and in the table for Oahu R).

This unit contains a total of 6 ha (15 ac) on State land. This unit is a portion of the Moku Manu State Seabird Sanctuary.

Table for Oahu R

Species	Chamaesyce kuwaleana	Sesbania tomentosa
1. 8–10 pop. guidelines	X *	X *
2. Island endemic.	X	
3. Multi-island/current other islands.		X
4. Multi-island/no current other islands.		
5. Non-viable populations.	X	X
6. Several occ. vulnerable to destruction	X	X
7. Species with variable habitats.	X	X
8. Not all occupied habitat needed		X
9. Long-lived perennial–100/pop.		
10. Short-livedperennial–300/pop.	X	X
11. Annual–500/pop.		
12. Narrow endemic.		
13. Restricted habitat requirements		
14. Hybridization is possible.		
Notes	*Not enough suitable habitat for 8 to 10 pops	*Species is wide ranging, each island was probably one large, population.

Oahu S

The proposed unit Oahu S provides unoccupied habitat for two species: *Sesbania tomentosa* and *Vigna o-wahuense.* Designation of this unit is essential to the conservation of these species because it contains the physical and biological features that are considered essential for their conservation on Oahu, and provides habitat to support one or more additional populations necessary to meet the recovery objectives for these species of 8 to 10 populations and 300 mature individuals per population throughout their known historical range (see the discussion of conservation requirements in Section D, and in the table for Oahu S).

This unit contains a total of 4 ha (12 ac) on State land. This unit is one of the Mokulua Islands State Seabird Sanctuary.

Table for Oahu S

Species	Sesbania tomentosa	Vigna o–wahuensis
1. 8–10 pop. guidelines	X *	X *
2. Island endemic.		
3. Multi-island/current other islands.	X	X* *
4. Multi-island/no current other islands.		
5. Non-viable populations.	X	X **
6. Several occ. vulnerable to destruction	X	
7. Species with variable habitats.	X	
8. Not all occupied habitat needed	X	
9. Long-lived perennial–100/pop.		
10. Short-livedperennial–300/pop.	X	X
11. Annual–500/pop.		
12. Narrow endemic.		
13. Restricted habitat requirements		X* **
14. Hybridization is possible.		
Notes	*Species is wide ranging, each island was probably one large, population.	*Species is wide ranging, each island was probably one large, population. **Historical on Oahu ***Open dry fossil reef, climbing over shrubs and grasses on limestone deposit and on fairly steep slopes.

Oahu T

The proposed unit Oahu T provides unoccupied habitat for two species: *Sesbania tomentosa* and *Vigna o-wahuense.* Designation of this unit is essential to the conservation of these species because it contains the physical and biological features that are considered essential for their conservation on Oahu, and provides habitat to support one or more additional populations necessary to meet the recovery objectives for each species of 8 to 10 populations and 300 mature individuals per population throughout their known historical range (see the discussion of conservation requirements in Section D, and in the table for Oahu T).

This unit contains a total of 4 ha (9 ac) on State land. This unit is one of the Mokulua Islands State Seabird Sanctuary.

Table for Oahu T

Species	Sesbania tomentosa	Vigna o–wahuensis
1. 8–10 pop. guidelines	X *	X *
2. Island endemic.		
3. Multi-island/current other islands.	X	X* *
4. Multi-island/no current other islands.		
5. Non-viable populations.	X	X **
6. Several occ. vulnerable to destruction	X	
7. Species with variable habitats.	X	
8. Not all occupied habitat needed	X	
9. Long-lived perennial–100/pop.		
10. Short-livedperennial–300/pop.	X	X
11. Annual–500/pop.		
12. Narrow endemic.		
13. Restricted habitat requirements		X* **
14. Hybridization is possible.		
Notes	*Species is wide ranging, each island was probably one large, population.	*Species is wide ranging, each island was probably one large, population. **Historical on Oahu ***Open dry fossil reef, climbing over shrubs and grasses on limestone deposit and on fairly steep slopes.

Oahu U

The proposed unit Oahu U provides unoccupied habitat for three species: *Chamaesyce kuwaleana, Sesbania tomentosa,* and *Vigna o-wahuense.* Designation of this unit is essential to the conservation of these species because it contains the physical and biological features that are considered essential for their conservation on Oahu, and provides habitat to support one or more additional populations necessary to meet the recovery objectives for these species of 8 to 10 populations and 100 mature individuals per population of *Vigna o-wahuense,* or 300 mature individuals per population of *Chamaesyce kuwaleana* and *Sesbania tomentosa,* throughout their known historical range (see the discussion of conservation requirements in Section D, and in the table for Oahu U).

This unit contains a total of 27 ha (67 ac) on State land. This unit is the Manana Island State Seabird Sanctuary.

Table for Oahu U

Species	Chamaesyce kuwaleana	Sesbania tomentosa
1. 8–10 pop. guidelines	X *	X *
2. Island endemic.	X	
3. Multi-island/current other islands.		X
4. Multi-island/no current other islands.		
5. Non-viable populations.	X	X
6. Several occ. vulnerable to destruction	X	X
7. Species with variable habitats.	X	X
8. Not all occupied habitat needed		X
9. Long-lived perennial–100/pop.		
10. Short-livedperennial–300/pop.	X	X
11. Annual–500/pop.		
12. Narrow endemic.		
13. Restricted habitat requirements		
14. Hybridization is possible.		
Notes	*Not enough suitable habitat for 8 to 10 pops	*Species is wide ranging, each island was probably one large, population.

Vigna o-wahuensis	X *		X* *		X **				X		X* **	*Species is wide ranging, each island was probably one large, population. **Historical on Oahu ***Open dry fossil reef, climbing over shrubs and grasses on limestone deposit and on fairly steep slopes.

Oahu V

The proposed unit Oahu V provides unoccupied habitat for one species: *Sesbania tomentosa.* Designation of this unit is essential to the conservation of this species because it contains the physical and biological features that are considered essential for its conservation on Oahu, and provides habitat to support one or more additional populations necessary to meet the recovery objectives for this species of 8 to 10 populations and 300 mature individuals per population throughout its known historical range (see the discussion of conservation requirements in Section D, and in the table for Oahu V).

This unit contains a total of 4 ha (10 ac) on State land. This unit is the Kaohikaipu Island State Seabird Sanctuary.

Table for Oahu V

Species	Sesbania tomentosa
1. 8–10 pop. guidelines	X *
2. Island endemic.	
3. Multi-island/current other islands.	X
4. Multi-island/no current other islands.	
5. Non-viable populations.	X
6. Several occ. vulnerable to destruction	X
7. Species with variable habitats.	X
8. Not all occupied habitat needed	X
9. Long-lived perennial–100/pop.	
10. Short-livedperennial–300/pop.	X
11. Annual–500/pop.	
12. Narrow endemic.	
13. Restricted habitat requirements	
14. Hybridization is possible.	
Notes	*Species is wide ranging, each island was probably one large, population.

Oahu W

The proposed unit Oahu W provides occupied habitat for two species: *Centaurium sebaeoides* and *Marsillea villosa*. It is proposed for designation because it contains the physical and biological features that are considered essential for their conservation on Oahu, and provides habitat to support one or more of the 8 to 10 populations and 300 mature individuals per population for *Centaurium sebaeoides,* or one or more of the 6 populations for *Marsilea villosa,* throughout their known historical range considered by the recovery plans to be necessary for the conservation of each species. This unit also provides unoccupied habitat for one species: *Cyperus trachysanthos.* Designation of this unit is essential to the conservation of this species because it contains the physical and biological features that are considered essential for its conservation on Oahu, and provides habitat to support one or more additional populations necessary to meet the recovery objectives for this species of 8 to 10 populations and 300 mature individuals throughout its known historical range (see the discussion of conservation requirements in Section D, and in the table for Oahu W).

This unit contains a total of 340 ha (840 ac) on private and City and County of Honolulu lands. The natural features found in this unit are portions of Koko Head, Nonoula, Ihiihilaūakea, Kuamoo Kane, and Puu Mai.

Table for Oahu W

Species	Centaurium sebaeoides	Cyperus trachysanthos	Marsilea villosa
1. 8–10 pop. guidelines		X *	X *
2. Island endemic.			
3. Multi-island/current other islands.	X	X	X
4. Multi-island/no current other islands.			
5. Non-viable populations.	X	X	X
6. Several occ. vulnerable to destruction	X		X
7. Species with variable habitats.			
8. Not all occupied habitat needed			
9. Long-lived perennial–100/pop.			
10. Short-livedperennial–300/pop.		X	
11. Annual–500/pop.	X		X
12. Narrow endemic.	X		
13. Restricted habitat requirements		X* *	
14. Hybridization is possible.	X *		X **
Notes		*Species is wide ranging, each island was probably one large, population. **wet sites (mud flats, wet clay soil, seasonal ponds, or wet cliff seeps) on coastal cliffs or talus slopes	*Recovery goal is 6 populations. **Seasonal wetlands in cinder craters, vernal pools surrounded by lowland dry forest vegetation, mud flats, and lowland grasslands.

Oahu X

The proposed unit Oahu X (X1 and X2) provides occupied habitat for two species: *Cyperus trachysanthos* and *Spermolepis hawaiiensis.* It is proposed for designation because it contains the physical and biological features that are considered essential for their conservation on Oahu, and provides habitat to support one or more of the 8 to 10 populations and 300 mature individuals per population for *Cyperus trachysanthos,* or 500 mature individuals for *Spermolepis hawaiiensis,* throughout their known historical range considered by the recovery plans to be necessary for the conservation of each species. This unit also provides unoccupied habitat for two species: *Gouania meyenii* and *Marsilea villosa.* Designation of this unit is essential to the conservation of these species because it contains the physical and biological features that are considered essential for their conservation on Oahu, and provides habitat to support one or more additional populations necessary to meet the recovery objectives for these species of 8 to 10 populations and 300 mature individuals for *Gouania meyenii,* or one or more of the 6 populations for *Marsilea villosa,* throughout their known historical range (see the discussion of conservation requirements in Section D, and in the table for Oahu X).

This unit contains a total of 125 ha (290 ac) on State land and land leased to the Hawaii Army National Guard. This unit contains units X1 and X2. This unit is a portion of the Diamond Head State Monument and includes the Kuilei Cliffs portion of the crater.

Table for Oahu X

Species	1. 8–10 pop. guidelines	2. Island endemic.	3. Multi-island/current other islands.	4. Multi-island/no current other islands.	5. Non-viable populations.	6. Several occ. vulnerable to destruction	7. Species with variable habitats.	8. Not all occupied habitat needed	9. Long-lived perennial–100/pop.	10. Short-livedperennial–300/pop.	11. Annual–500/pop.	12. Narrow endemic.	13. Restricted habitat requirements	14. Hybridization is possible.	Notes
Cyperus trachysanthos	X *		X		X					X			X** *		*Species is wide ranging, each island was probably one large, population. **wet sites (mud flats, wet clay soil, seasonal ponds, or wet cliff seeps) on coastal cliffs or talus slopes
Gouania meyenii	X		X		X	X	X			X					
Marsilea villosa	X *		X		X	X					X		X** *		*Recovery goal is 6 populations. **Seasonal wetlands in cinder craters, vernal pools surrounded by lowland dry forest vegetation, mud flats, and lowland grasslands.
Spermolepis hawaiiensis			X		X	X					X	X		X *	

Effects of Critical Habitat Designation

Section 7 Consultation

Section 7(a) 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. Destruction or adverse modification occurs when a Federal action directly or indirectly alters critical habitat to the extent it appreciably diminishes the value of critical habitat for the conservation 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 species proposed for listing 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 the Federal action agency. Formal conference reports include an opinion that is prepared according to 50 CFR 402.14, as if the species was listed or critical habitat was designated. We may adopt the formal conference report as the biological opinion when the species is listed or 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 Federal action may affect a listed species or its critical habitat, the responsible Federal agency (action agency) must enter into formal consultation with us. Through this consultation, the Federal action agency would ensure that the permitted actions do not destroy or adversely modify critical habitat.

If we issue a biological opinion concluding that a project is likely to result in the destruction or adverse modification of critical habitat, we would 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 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.

Regulations at 50 CFR 402.16 require Federal agencies to reinitiate consultation on previously reviewed actions under certain circumstances, including instances where critical habitat is subsequently designated and the Federal agency has retained discretionary involvement, or control has been retained or is authorized by law. Consequently, some Federal agencies may request reinitiation of consultation or conferencing with us on actions for which formal consultation has been completed if those actions may affect designated critical habitat or adversely modify or destroy proposed critical habitat.

Activities on Federal lands that may affect critical habitat of one or more of the 99 plant species will require Section 7 consultation. Activities on private or State lands requiring a permit from a Federal agency, such as a permit from the U.S. Army Corps of Engineers (Corps) under section 404 of the Clean Water Act (33 U.S.C. 1344 *et seq.*), or a section 10(a)(1)(B) permit from us, or some other Federal action, including funding (*e.g.* from the Federal Highway Administration, Federal Aviation Administration (FAA), Federal Emergency Management Agency (FEMA)), permits from the Department of Housing and Urban Development, activities funded by the Environmental Protection Agency (EPA), Department of Energy, or any other Federal agency; regulation of airport improvement activities by the FAA; and construction of communication sites licensed by the Federal Communication Commission will also continue to be subject to the section 7 consultation process. Federal actions not affecting critical habitat and actions on non-Federal lands that are not federally funded, authorized, or permitted do 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. 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 adversely affect critical habitat include, but are not limited to:

(1) Activities that appreciably degrade or destroy the primary constituent elements 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, herbicide application); introducing or enabling the spread of non-native species; and taking actions that pose a risk of fire;

(2) Activities that alter watershed characteristics in ways that would appreciably reduce groundwater recharge or alter natural, dynamic wetland or other vegetative communities. Such activities may include water diversion or impoundment, excess groundwater pumping, manipulation of vegetation such as timber harvesting, residential and commercial development, and grazing of livestock or horses that degrades watershed values;

(3) Rural residential construction that includes concrete pads for foundations and the installation of septic systems where a permit under section 404 of the Clean Water Act would be required by the Corps;

(4) Recreational activities that appreciably degrade vegetation;

(5) Mining of sand or other minerals;

(6) Introducing or encouraging the spread of non-native plant species; and

(7) Importation of non-native species for research, agriculture, and aquaculture, and the release of biological control agents.

If you have questions regarding whether specific activities will likely constitute adverse modification of critical habitat, contact the Field Supervisor, Pacific Islands Office (see **ADDRESSES** section). Requests for copies of the regulations on listed plants and animals, and inquiries about prohibitions and permits may be addressed to the U.S. Fish and Wildlife Service, Branch of Endangered Species/Permits, 911 N.E. 11th Ave., Portland, OR 97232–4181 (telephone 503/231–2063; facsimile 503/231–6243).

Relationship to Habitat Conservation Plans and Other Planning Efforts

Currently, there are no HCPs that include any of the plant species discussed in this proposal as covered species. In the event that future HCPs covering any of the discussed plant species are developed within the boundaries of designated critical habitat, we will work with applicants to encourage them to provide for protection and management of habitat areas essential to the conservation of the species. This could be accomplished by either directing development and habitat modification to nonessential

areas, or appropriately modifying activities within essential habitat areas so that such activities will not adversely modify the primary constituent elements. The HCP development process would provide an opportunity for more intensive data collection and analysis regarding the use of particular areas by these plant species. If an HCP that addresses one or more of the 99 plant species as covered species is ultimately approved, we will reassess the critical habitat boundaries in light of the HCP. We intend to undertake this review when the HCP is approved, but funding and priority constraints may influence the timing of such a review.

Economic and Other Relevant Impacts

Section 4(b)(2) of the Act requires us to 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 specifying such areas as critical habitat. We cannot exclude such areas from critical habitat when such exclusion will result in the extinction of the species concerned.

We will conduct an analysis of the economic impact of designating these areas as critical habitat and in accordance with recent decisions in the *N.M. Cattlegrowers Ass'n* v. *U.S. Fish and Wildlife Serv.,* 248 F.3d 1277 (10th Cir. 2001) prior to a final determination. The economic analysis will include detailed information on the baseline costs and benefits of the critical habitat designation regardless of whether the costs are coextensive with listing, where such estimates are available. This information on the baseline will allow a fuller appreciation of the economic impacts associated with critical habitat designation. When completed, we will announce the availability of the revised draft economic analysis with a notice in the **Federal Register**, and we will open a public comment period on the draft economic analysis and re-open the comment period on the proposed rule at that time.

We will utilize the final economic analysis, and take into consideration all comments and information regarding economic or other impacts submitted during the public comment period and the public hearing, if requested, to make final critical habitat designations. We may exclude areas from critical habitat upon a determination that the benefits of such exclusions outweigh the benefits of specifying such areas as part of critical habitat; however, we cannot exclude areas from critical habitat when such exclusion will result in the extinction of the species.

Public Comments Solicited

It is our intent 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.

We invite 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, we may delete 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 elimination or adequate reduction of relevant threats to the species.

We are soliciting comment in this proposed rule on whether current land management plans or practices applied within areas proposed as critical habitat adequately address the threats to these listed species.

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 Oahu. We are soliciting comments in this proposed rule on whether current land management plans or practices applied within the areas proposed as critical habitat provide for the conservation of the species by adequately addressing the threats. We are also soliciting comments on whether future development and approval of conservation measures (*e.g.,* HCPs, Conservation Agreements, Safe Harbor Agreements) 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);

(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 the 99 species, 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 impacts resulting from the proposed designations of critical habitat, including any impacts on small entities, energy development, low income households, and local governments;

(6) Economic and other potential values associated with designating critical habitat for the above 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);

(7) The methodology we might use, under section 4(b)(2) of the Act, in determining if the benefits of excluding an area from critical habitat outweigh the benefits of specifying the area as critical habitat; and

(8) The effects of critical habitat designation on military lands, and how it would affect military activities, particularly military lands at Makua Military Reservation, Schofield Barracks East Range, Schofield Barracks Military Reservation, Kawailoa Training Area, Kahuku Training Area, Dillingham Military Reservation, Naval Magazine Pearl Harbor Lualualei Branch and Naval Computer Telecommunication Area Master Station Pacific Transmitting Facility at Lualualei, Hawaii Army National Guard lands at Diamond Head; whether there will be a significant impact on military readiness or national security if we designate critical habitat on these facilities; and whether these facilities should be excluded from the designation under section 4(b)(2) of the Act.

If you wish to comment, you may submit your comments and materials concerning this proposal by any 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: *oahucrithabplants@r1.fws.gov.* If you submit comments by e-mail, please submit them as an ASCII file and avoid the use of special characters and any

form of encryption. Please also include ''Attn: RIN 1018–AI24'' 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 Honolulu Fish and Wildlife Office at telephone number 808/541–3441.

(3) You may hand-deliver comments to our Honolulu Fish and Wildlife Office at the address under (1) above.

Comments and materials received, as well as supporting documentation used in preparation of the proposal to designate critical habitat, will be available for inspection, by appointment, during normal business hours at the address under (1) above. Our practice is to make comments, including names and home addresses of respondents, available for public review during regular business hours. Individual 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. 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.

The comment period closes on July 29, 2002. We are seeking comments or suggestions from the public, other concerned governmental agencies, the scientific community, industry, or any other interested parties concerning the proposed rule.

Public Hearing

The Act provides for a public hearing on this proposal, if requested. Requests for public hearings must be made within 45 days of the date of publication of this proposal in the **Federal Register**.

Anyone wishing to make an oral statement for the record is encouraged to provide a written copy of their statement and present it to us at the hearing. In the event there is a large attendance, the time allotted for oral statements may be limited. Oral and written statements receive equal consideration. There are no limits to the length of written comments presented at the hearing or mailed to the Service. For additional information on public hearings see the **ADDRESSES** section.

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 a 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) 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.

Taxonomic Changes

At the time we listed *Hibiscus brackenridgei, Phyllostegia parviflora,* and *Mariscus pennatiformis,* we followed the taxonomic treatments in Wagner *et al.* (1990), the widely used and accepted *Manual of the Flowering Plants of Hawaii.* Subsequent to the final listings for these three species, we became aware of new taxonomic treatments for these species (See Discussion of Plant Taxa). Due to the court-ordered deadlines, we are required to publish this proposal to designate critical habitat on Oahu before we can prepare and publish a notice of taxonomic changes for these three species. We propose to publish a taxonomic change notice for these three species after we have published the final critical habitat designations on Oahu.

Required Determinations

Regulatory Planning and Review

In accordance with Executive Order 12866, this document is a significant rule and was reviewed by the Office of Management and Budget (OMB) in accordance with the four criteria discussed below. We are preparing an economic analysis of this proposed action, which will be available for public comment, to determine the economic consequences of designating the specific areas identified as critical habitat. The availability of the draft economic analysis will be announced in the **Federal Register** so that it is available for public review and comments.

(a) While 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 rule will have an annual economic effect of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State or local governments or communities. Therefore, at this time, we do not believe a cost benefit and economic analysis pursuant to Executive Order 12866 is required. We will revisit this if the economic analysis indicates greater impacts than currently anticipated.

The dates for which the 99 plant species were listed as threatened or endangered can be found in Table 3(b). Consequently, and as needed, we conduct formal and informal section 7 consultations with other Federal agencies to ensure that their actions will not jeopardize the continued existence of these species. Under the Act, critical habitat may not be adversely modified by a Federal agency action. Critical habitat does not impose any restrictions on non-Federal persons unless they are conducting activities funded or otherwise sponsored, authorized, or permitted by a Federal agency (see Table 5).

TABLE 5.—IMPACTS OF CRITICAL HABITAT DESIGNATION FOR 99 PLANTS FROM OAHU

Categories of activities	Activities potentially affected by species listing only	Additional activities potentially affected by critical habitat designation [1]
Federal Activities Potentially Affected [2].	Activities conducted by the Federal Government (*e.g.,* Army Corps of Engineers, Department of Transportation, Department of Defense, Department of Agriculture, Environmental Protection Agency, Federal Emergency Management Agency, Federal Aviation Administration, Federal Communications Commission, Department of the Interior) or that require a Federal action (permit, authorization, or funding) and may remove or destroy habitat for these plants by mechanical, chemical, or other means (*e.g.*, overgrazing, clearing, cutting native live trees and shrubs, water diversion, impoundment, groundwater pumping, road building, mining, herbicide application, recreational use, etc.) or appreciably decrease habitat value or quality through indirect effects (*e.g.* edge effects, invasion of exotic plants or animals, fragmentation of habitat).	These same activities carried our by Federal agencies in designated areas where section 7 consultations would not have occurred but for the critical habitat designation.
Private or other non-Federal Activities Potentially Affected [3].	Activities that require a Federal action (permit, authorization, or funding) and may remove or destroy habitat for these plants by mechanical, chemical, or other means (*e.g.*, overgrazing, clearing, cutting native live trees and shrubs, water diversion, impoundment, groundwater pumping, road building, mining, herbicide application, recreational use, etc.) or appreciably decrease habitat value or quality through indirect effects (*e.g.*, edge effects, invasion of exotic plants or animals, fragmentation of habitat).	These same activities carried out in designated areas where section 7 consultations would not have occurred but for the critical habitat designation.

[1] This column represents activities potentially affected by the critical habitat designation in addition to those activities potentially affected by listing the species.
[2] Activities initiated by a Federal agency.
[3] Activities initiated by a private or other non-Federal entity that may need Federal authorization or funding.

Section 7 of the Act requires Federal agencies to ensure that they do not jeopardize the continued existence of these species. Based on our experience with these species and their needs, we conclude that most Federal or federally-authorized actions that could potentially cause an adverse modification of the proposed critical habitat would currently be considered as ''jeopardy'' under the Act in areas occupied by the species because consultation would already be required due to the presence of the listed species, and the duty to avoid adverse modification of critical habitat would not trigger additional regulatory impacts beyond the duty to avoid jeopardizing the species. Accordingly, we do not expect the designation of currently occupied areas as critical habitat to have any additional incremental impacts on what actions may or may not be conducted by Federal agencies or non-Federal persons that receive Federal authorization or funding.

The designation of areas as critical habitat where section 7 consultations would not have occurred but for the critical habitat designation (that is, in areas currently unoccupied by the listed species), may have impacts that are not attributable to the species listing on what actions may or may not be conducted by Federal agencies or non-Federal persons who receive Federal authorization or funding. We will evaluate any impact through our economic analysis (under section 4 of the Act; see Economic Analysis section of this rule). Non-Federal persons who do not have a Federal nexus with their actions are not restricted by the designation of critical habitat.

(b) We do not expect this rule to create inconsistencies with other agencies' actions. As discussed above, Federal agencies have been required to ensure that their actions do not jeopardize the continued existence of the 99 plant species since their listing between 1991 and 1996. For the reasons discussed above, the prohibition against adverse modification of critical habitat would be expected to impose few, if any, additional restrictions to those that currently exist in the proposed critical habitat on currently occupied lands. However, we will evaluate any impact of designating areas where section 7 consultations would not have occurred but for the critical habitat designation through our economic analysis. Because of the potential for impacts on other Federal agency activities, we will continue to review this proposed action for any inconsistencies with other Federal agency actions.

(c) We do not expect this proposed rule, if made final, to significantly 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 a listed species, and, as discussed above, we do not anticipate that the adverse modification prohibition, resulting from critical habitat designation will have any incremental effects in areas of occupied habitat on any Federal entitlement, grant, or loan program. We will evaluate any impact of designating areas where section 7 consultation would not have occurred but for the critical habitat designation through our economic analysis.

(d) OMB has determined that this rule may raise novel legal or policy issues and, as a result, this rule has undergone OMB review.

Regulatory Flexibility Act (5 U.S.C. 601 et seq.)

Under the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*, as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996), whenever an agency is required to publish a notice of rulemaking for any proposed or final rule, it must prepare and make available for public comment a regulatory flexibility analysis that describes the effects of the rule on small entities (i.e., small businesses, small organizations, and small government jurisdictions). However, no regulatory flexibility analysis is required if the head of the agency certifies the rule will not have a significant economic impact on a substantial number of small entities. SBREFA amended the Regulatory Flexibility Act (RFA) to require Federal agencies to provide a statement of the factual basis for certifying that the rule will not have a significant economic effect on a substantial number of small entities. SBREFA also amended the RFA to require a certification statement. In today's rule, we are certifying that the rule will not have a significant effect on

a substantial number of small entities. However, should our economic analysis provide a contrary indication, we will revisit this determination at that time. The following discussion explains our rationale.

According to the Small Business Administration, small entities include small organizations, such as independent non-profit organizations, and small governmental jurisdictions, including school boards and city and town governments that serve fewer than 50,000 residents, as well as small businesses. Small businesses include manufacturing and mining concerns with fewer than 500 employees, wholesale trade entities with fewer than 99 employees, retail and service businesses with less than $5 million in annual sales, general and heavy construction businesses with less than $27.5 million in annual business, special trade contractors doing less than $11.5 million in annual business, and agricultural businesses with annual sales less than $750,000. To determine if potential economic impacts to these small entities are significant, we consider the types of activities that might trigger regulatory impacts under this rule as well as the types of project modifications that may result. In general, the term significant economic impact is meant to apply to a typical small business firm's business operations.

To determine if the rule would affect a substantial number of small entities, we consider the number of small entities affected within particular types of economic activities (e.g., housing development, grazing, oil and gas production, timber harvesting, etc.). We apply the ''substantial number'' test individually to each industry to determine if certification is appropriate. In some circumstances, especially with proposed critical habitat designations of very limited extent, we may aggregate across all industries and consider whether the total number of small entities affected is substantial. In estimating the numbers of small entities potentially affected, we also consider whether their activities have any Federal involvement; some kinds of activities are unlikely to have any Federal involvement and so will not be affected by critical habitat designation.

Designation of critical habitat only affects activities conducted, funded, or permitted by Federal agencies; non-Federal activities are not affected by the designation. In areas where the species is present, Federal agencies are already required to consult with us under section 7 of the Act on activities that they fund, permit, or implement that may affect *Abutilon sandwicense, Adenophorus periens, Alectryon macrococcus, Alsinidendron obovatum, Alsinidendron trinerve, Bonamia menziesii, Cenchrus agrimonioides, Centaurium sebaeoides, Chamaesyce celastroides* var. *kaenana, Chamaesyce deppeana, Chamaesyce herbstii, Chamaesyce kuwaleana, Chamaesyce rockii, Colubrina oppositifolia, Ctenitis squamigera, Cyanea acuminata, Cyanea crispa, Cyanea grimesiana* ssp. *grimesiana, Cyanea grimesiana* ssp. *obatae, Cyanea humboltiana, Cyanea koolauensis, Cyanea longiflora, Cyanea pinnatifida, Cyanea st.-johnii, Cyanea superba, Cyanea truncata, Cyperus trachysanthos, Cyrtandra dentata, Cyrtandra polyantha, Cyrtandra subumbellata, Cyrtandra viridiflora, Delissea subcordata, Diellia erecta, Diellia falcata, Diellia unisora, Diplazium molokaiense, Dubautia herbstobatae, Eragrostis fosbergii, Eugenia koolauensis, Euphorbia haeleeleana, Flueggea neowawraea, Gardenia mannii, Gouania meyenii, Gouania vitifolia, Hedyotis coriacea, Hedyotis degeneri, Hedyotis parvula, Hesperomannia arborescens, Hesperomannia arbuscula, Hibiscus brackenridgei, Isodendrion laurifolium, Isodendrion longifolium, Isodendrion pyrifolium, Labordia cyrtandrae, Lepidium arbuscula, Lipochaeta lobata* var. *leptophylla, Lipochaeta tenuifolia, Lobelia gaudichaudii* ssp. *koolauensis, Lobelia monostachya, Lobelia niihauensis, Lobelia oahuensis, Lysimachia filifolia, Mariscus pennatiformis, Marsilea villosa, Melicope pallida, Melicope saint-johnii, Myrsine juddii, Neraudia angulata, Nototrichium humile, Pelea lydgatei, Peucedanum sandwicense, Phlegmariurus nutans, Phyllostegia hirsuta, Phyllostegia kaalaensis, Phyllostegia mollis, Phyllostegia parviflora, Plantago princeps, Platanthera holochila, Pteris lidgatei, Sanicula mariversa, Sanicula purpurea, Schiedea hookeri, Schiedea kaalae, Schiedea kealiae, Schiedea nuttallii, Sesbania tomentosa, Silene lanceolata, Silene perlmanii, Solanum sandwicense, Spermolepis hawaiiensis, Stenogyne kanehoana, Tetramolopium filiforme, Tetramolopium lepidotum* ssp. *lepidotum, Tetraplasandra gymnocarpa, Trematalobelia singularis, Urera kaalae, Vigna o-wahuensis, Viola chamissoniana* ssp. *chamissoniana,* and *Viola oahuensis.* If these critical habitat designations are finalized, Federal agencies must also consult with us if their activities may affect designated critical habitat. However, in areas where the species is present, we do not believe this will result in any additional regulatory burden on Federal agencies or their applicants because consultation would already be required due to the presence of the listed species, and the duty to avoid adverse modification of critical habitat would not trigger additional regulatory impacts beyond the duty to avoid jeopardizing the species.

Even if the duty to avoid adverse modification does not trigger additional regulatory impacts in areas where the species is present, designation of critical habitat could result in an additional economic burden on small entities due to the requirement to reinitiate consultation for ongoing Federal activities. However, since these 99 plant species were listed (between 1991 and 1996), there have been two formal consultations, and we have conducted 23 informal consultations, in addition to consultations on Federal grants to State wildlife programs, which would not affect small entities. Two formal consultations were conducted on behalf of the Army, for review of the ''Biological Assessment for Programmatic Section 7 Consultation on Routine Military Training at Makua Military Reservation, and Makua Endangered Species Mitigation Plan''. Thirty-nine of the 99 species, *Alectryon macrococcus, Abutilon sandwicense, Alsinidendron obovatum, Bonamia menziesii, Cenchrus agrimonioides, Chamaesyce celastroides* var. *kaenana, Chamesyce herbstii, Colubrina oppositifolia, Ctenitis squamigera, Cyanea grimesiana* ssp. *grimesiana, Cyanea longiflora, Cyanea superba, Cyrtandra dentata, Delissea subcordata, Diellia falcata, Dubautia herbstobatae, Euphorbia haeleeleana, Flueggea neowawraea, Hedyotis degeneri, Hedyotis parvula, Hesperomannia arbuscula, Hibiscus brackenridgei, Lepidium arbuscula, Lipochaeta tenuifolia, Lobelia niihauensis, Lobelia oahuensis, Neraudia angulata, Nototrichium humile, Peucedanum sandwicense, Phyllostegia kaalaensis, Plantago princeps, Sanicula mariversa, Schiedea hookeri, Schiedea kaalae, Schiedea nuttallii, Silene lanceolata, Spermolepis hawaiiensis, Tetramolopium filiforme,* and *Viola chamissoniana* ssp. *chamissoniana,* were reported from the action area.

One informal consultation was conducted on behalf of the Army for a flood control study, who requested information on the candidate, proposed, or listed threatened or endangered species within the vicinity of the project area. One of the 99 species, *Cyanea superba* was reported historically from the project area. One informal

consultation was conducted on behalf of U.S. Air Force for the Kaena Point Tracking Station site, who requested a list of the endangered, threatened, and proposed species that occur on or in the vicinity of the site. Two of the 99 species, *Chamaesyce celastroides* var. *kaenana* and *Nototrichium humile* were reported from the vicinity of the site. One informal consultation was conducted on behalf of the Navy in regard to Lualualei Naval Magazine, who requested comments on the July 11, 1995 ''Work Plan for the Implementation of Priority Conservation Measures to Protect Rare and Endangered Biological Resources at Naval Magazine Lualualei, Headquarters, Oahu, Hawaii''. Six of the 99 species, *Abutilon sandwicense, Flueggea neowawraea, Hedyotis parvula, Lipochaeta lobata* var. *leptophylla, Neraudia angulata* var. *dentata,* and *Viola chamissoniana* ssp. *chamissoniana* were reported from the project area. Two informal consultations were conducted on behalf of the Army, who requested comments on the November 1995 Preliminary Draft Endangered Species Management Plan (ESMP) for the Oahu Training Areas (OTA) and review of revisions to the plan. Fifty-eight of the 99 species, *Alectryon macrococcus, Alsinidendron obovatum, Alsinidendron trinerve, Bonamia menziesii, Cenchrus agrimonioides, Chamaesyce celastroides* var. *kaenana, Chamaesyce herbstii, Chamaesyce rockii, Ctenitis squamigera, Cyanea acuminata, Cyanea crispa, Cyanea grimesiana* ssp. *grimesiana, Cyanea grimesiana* ssp. *obatae, Cyanea humboltiana, Cyanea koolauensis, Cyanea longiflora, Cyanea superba, Cyrtandra dentata, Cyrtandra subumbellata, Cyrtandra viridiflora, Delissea subcordata, Diellia falcata, Dubautia herbstobatae, Eugenia koolauensis, Euphorbia haeleeleana, Flueggea neowawraea, Gardenia mannii, Hedyotis degeneri, Hedyotis parvula, Hesperomannia arborescens, Hesperomannia arbuscula, Labordia cyrtandrae, Lepidium arbuscula, Lipochaeta tenuifolia, Lobelia gaudichaudii* ssp. *koolauensis, Lobelia niihauensis, Lobelia oahuensis, Neraudia angulata, Nototrichium humile, Pelea lydgatei, Phlegmariurus nutans, Phyllostegia hirsuta, Phyllostegia kaalaensis, Phyllostegia mollis, Plantago princeps, Pteris lidgatei, Sanicula mariversa, Sanicula purpurea, Schiedea hookeri, Schiedea kaalae, Schiedea kealiae, Schiedea nuttallii, Silene lanceolata, Tetramolopium filiforme, Tetraplasandra gymnocarpa, Urera kaalae, Viola chamissoniana* ssp. *chamissoniana,* and *Viola oahuensis,* were reported from the project area. Two informal consultations were conducted on behalf of the FAA, for the effects of relocation and demolition of the FAA's Diamond Head facility. One of the 99 species, *Schiedea adamantis* was reported from the project area. Two informal consultations was conducted on behalf of the Department of Transportation, who requested a list of the proposed and listed threatened and endangered species in the vicinity of the proposed corridor for the North-South Road Project and our concurrence with the project. Two of the 99 species, *Centaurium sebaeoides* and *Marsillea villosa* were reported from the project area. One informal consultation was conducted on behalf of the U.S. Coast Guard, for the effects of lowering of antenna spans at the Haiku Valley Omega Station. Two of the 99 species, *Tetraplasandra gymnocarpa* and *Trematalobelia singularis* were reported from the project area. One informal consultations was conducted on behalf of the Navy, for the effect of cattle removal on endangered plant species. Five of the 99 species, *Abutilon sandwicense, Bonamia menziesii, Flueggea neowawraea, Lobelia niihauensis,* and *Neraudia angulata* were reported from the vicinity of the project area. One informal consultations was conducted on behalf of the Department of Land and Natural Resources Division of State Parks, for review of the Ka Iwi shoreline project categorical exclusion document. Two of the 99 species, *Cyperus trachysanthos* and *Marsillea villosa* was reported from the project area. Two informal consultations were conducted on behalf of the Army, for review of effects of prescribed burns at Schofield Barracks West Range. Three of the 99 species, *Delissea subcordata, Isodendrion longifolium,* and *Neraudia angulata* var. *angulata* were reported from the vicinity of the project area. One informal consultation was conducted on behalf of the Army, who requested we review the effects of insecticidal treatment on one of the 99 species, *Flueggea neowawraea.* Two informal consultation were conducted on behalf of the Hawaii Army National Guard, who requested we review the effects of training activities and road improvements on listed threatened and endangered species. Two of the 99 species, *Schiedea adamantis* and *Cyperus trachysanthos* were reported from the project area. One informal consultation was conducted on behalf of the Army, who requested we review their ''Makua Propagation and Outplanting Plans for Endangered Plants''. Four of the 99 species, *Cyanea superba, Alsinidendron obovatum, Cenchrus agrimonioides,* and *Delissea subcordata* were addressed in the plan. Two informal consultations were conducted on behalf of the U.S. Department of Agriculture Animal and Plant Health Inspection Service, who requested we review their determination that establishing and monitoring transects to determine feral pig activity is categorically excluded under National Environmental Policy Act, and that radio tagging and releasing feral pigs for research in Kuaokala game management area is also categorically excluded under NEPA. Forty-eight of the 99 species, *Abutilon sandwicense, Alectryon macrococcus, Alsinidendron obovatum, Bonamia menziesii, Cenchrus agrimonioides, Chamaesyce herbstii, Chamaesyce kuwaleana, Chamaesyce rockii, Colubrina oppositifolia, Ctenitis squamigera, Cyanea acuminata, Cyanea grimesiana* ssp. *grimesiana, Cyanea koolauensis, Cyanea longiflora, Cyanea st.-johnii, Cyanea superba, Cyrtandra dentata, Cyrtandra subumbellata, Delissea subcordata, Diellia falcata, Dubautia herbstobatae, Eragrostis fosbergii, Flueggea neowawraea, Gardenia mannii, Gouania meyenii, Gouania vitifolia, Hedyotis degeneri, Hedyotis parvula, Hesperomannia arbuscula, Hesperomannia arborescens, Isodendrion laurifolium, Isodendrion longifolium, Lepidium arbuscula, Lipochaeta tenuifolia, Lobelia gaudichaudii* ssp. *koolauensis, Lobelia niihauensis, Myrsine juddii, Neraudia angulata, Nototrichium humile, Phlegmariurus nutans, Phyllostegia hirsuta, Phyllostegia kaalaensis, Pteris lydgatei, Schiedea hookeri, Schiedea kaalae, Schiedea nuttallii, Tetraplasnadra gymnocarpa,* and *Viola oahuensis* were reported from the project area. One informal consultation was conducted on behalf of the Army, who requested we review the effects of fencing in the upper reaches of Opaeula drainage in Kawailoa Training Area on listed endangered or threatened species. Four of the 99 species, *Cyrtandra viridiflora, Chamaesyce rockii, Myrsine juddii,* and *Viola oahuensis,* were reported from the project area. One informal consultation was conducted on behalf of the Army, who requested we review and comment on the ''redraft Biological Assessment for routine military training at Makua Military Reservation, Oahu, Hawaii''. Thirty-five of the 99 species, *Alectryon macrococcus, Alsinidendron obovatum, Bonamia menziesii, Cenchrus*

agrimonioides, Chamaesyce herbstii, Ctenitis squamigera, Cyanea grimesiana ssp. *grimesiana, Cyanea longiflora, Cyanea superba, Cyrtandra dentata, Delissea subcordata, Diellia falcata, Dubautia herbstobatae, Euphorbia haeleeleana, Flueggea neowawraea, Hedyotis degeneri, Hedyotis parvula, Hesperomannia arbuscula, Lepidium arbuscula, Lipochaeta tenuifolia, Lobelia niihauensis, Lobelia oahuensis, Neraudia angulata, Nototrichium humile, Peucedanum sandwicense, Phyllostegia kaalaensis, Plantago princeps, Sanicula mariversa, Schiedea hookeri, Schiedea kaalae, Schiedea nuttallii, Silene lanceolata, Spermolepis hawaiiensis, Tetramolopium filiforme,* and *Viola chamissoniana* ssp. *chamissoniana,* were reported from the project area. One informal consultation was conducted on behalf of the Service, for review of the effects of fencing of the south Ekahanui Gulch on listed endangered or threatened species. Nine of the 99 species, *Alectryon macrococcus, Chamaesyce herbstii, Diellia falcata, Diellia unisora, Melicope saint-johnii, Phyllostegia kaalaensis, Plantago princeps, Schiedea kaalae,* and *Urera kaalae* were reported from the project area. One informal consultation was conducted on behalf of the Army as a reminder of the contingency placed upon the Army in the ''Biological Opinion for routine military training at Makua Military Reservation, Oahu, Hawaii'' that the Army would start to implement priority stabilization measures for listed endangered and threatened species within one year of the opinion. One informal consultation was conducted on behalf of the Army, who requested we review the ''Draft Integrated Natural Resources Management Plan for 2002–2006 at Oahu Army Installations, Hawaii''. Fifty-four of the 99 species, *Alectryon macrococcus, Alsinidendron obovatum, Alsinidendron trinerve, Bonamia menziesii, Cenchrus agrimonioides, Chamaesyce celastroides* var. *kaenana, Chamaesyce rockii, Ctenitis squamigera, Cyanea acuminata, Cyanea crispa, Cyanea humboltiana, Cyanea koolauensis, Cyanea superba, Cyanea st.-johnii, Cyrtandra dentata, Cyrtandra subumbellata, Cyrtandra viridiflora, Delissea subcordata, Diellia falcata, Dubautia herbstobatae, Eugenia koolauensis, Euphorbia haeleeleana, Flueggea neowawraea, Gardenia mannii, Hedyotis degeneri, Hedyotis parvula, Hesperomannia arborescens, Hibiscus brackenridgei, Labordia cyrtandrae, Lepidium arbuscula, Lipochaeta tenuifolia, Lobelia gaudichaudii* ssp. *koolauensis, Lobelia niihauensis, Neraudia angulata, Nototrichium humile, Pelea lydgatei, Phlegmariurus nutans, Phyllostegia hirsuta, Phyllostegia mollis, Phyllostegia parvilfora, Plantago princeps, Pteris lidgatei, Sanicula mariversa, Sanicula purpurea, Schiedea hookeri, Schiedea kealiae, Schiedea nuttallii, Silene lanceolata, Spermolepis hawaiiensis, Tetramolopium filiforme, Tetraplasandra gymnocarpa, Urera kaalae, Viola chamissoniana* ssp. *chamissoniana,* and *Viola oahuensis,* were reported from the project area. One informal consultation was conducted on behalf of the Navy, who requested we review and comment on their ''Naval Computer and Telecommunications Area Master Station Pacific Integrated Natural Resources Management Plan''. One of the 99 species, *Marsillea villosa* was reported from the project area. One informal consultation was conducted on behalf of the U.S. Department of Energy, for review of the effects of a proposed telecommunications radio shack at Mauna Kapu on listed endangered and threatened species. One of the 99 species, *Tetramolopium lepidotum* ssp. *lepidotum* was reported from the project area.

None of these consultations affected or concerned small entities. In 22 of the 23 informal consultations, we concurred with each agency's determination that the project, as proposed, was not likely to adversely affect listed species. For both formal consultations, we concurred that routine military training at Makua Military Reservation, which included an in depth list of conservation measures the Army would carry out in the action area, was not likely to jeopardize listed species. None of these consultations affected or concerned small entities, and only the routine military training exercises conducted on Army training installations are ongoing. As a result, the requirement to reinitiate consultation for ongoing projects will not affect a substantial number of small entities on Oahu.

In areas where the species is clearly not present, designation of critical habitat could trigger additional review of Federal activities under section 7 of the Act, that would otherwise not be required. We are aware of relatively few private activities in the proposed critical habitat areas for these 99 plants that have Federal involvement, and thus, would require consultation or reinitiation of already completed consultations for on-going projects. As mentioned above, we have conducted 23 informal consultations and two formal consultations under section 7 involving many of the species none of which involved small entities. We cannot, at this time, easily identify future consultations that may be due to the listing of the species or the increment of additional consultations that may be required by this critical habitat designation. Therefore, for the purposes of this review and certification under the RFA, we are assuming that any future consultations in the area proposed as critical habitat will be due to the critical habitat designations.

On Oahu, approximately, 6 percent of the designations are on Federal lands, 35 percent are on State or County lands, and 59 percent are on private lands. Nearly all of the land within the critical habitat units is unsuitable for development, many land uses, and activities. This is due to their remote locations, lack of access, and rugged terrain. The majority of this land (90 percent) is within the State Conservation District where State land-use controls severely limit development and most activities. Approximately 10 percent of this land is within the State Agricultural District, and less than 1 percent is within the State Urban District. On non-Federal lands, activities that lack Federal involvement would not be affected by the critical habitat designations. However, activities of an economic nature that are likely to occur on non-Federal lands in the area encompassed by these proposed designations consist of improvements in State parks and communications and tracking facilities; ranching; road improvements; recreational use such as hiking, camping, picnicking, game hunting, fishing; botanical gardens; and, crop farming. On lands that are in agricultural production, the types of activities that might trigger a consultation include irrigation ditch system projects that may require section 404 authorizations from the Corps, and watershed management and restoration projects sponsored by Natural Resources Conservation Service. However, the Natural Resources Conservation Service restoration projects typically are voluntary, and the irrigation ditch system projects within lands that are in agricultural production are uncommon, and would likely affect only a small percentage of the small entities within these proposed critical habitat designations.

Lands that are within the State Urban District are located within undeveloped coastal areas and areas adjacent to Forest Reserves (State Conservation District). The types of activities that might trigger a consultation include shoreline restoration or modification projects that may require section 404 authorizations from the Corps or FEMA, housing or resort development that may

require permits from the Department of Housing and Urban Development, and activities funded or authorized by the EPA. However, we are not aware of a significant number of future activities that would require Federal permitting or authorization in these coastal areas. Therefore, we conclude that the proposed rule would not affect a substantial number of small entities.

We are not aware of any commercial activities on the Federal lands included in these proposed critical habitat designations.

In general, two different mechanisms in section 7 consultations could lead to additional regulatory requirements. First, if we conclude, in a biological opinion, that a proposed action is likely to jeopardize the continued existence of a species or adversely modify its critical habitat, we can offer ''reasonable and prudent alternatives.'' Reasonable and prudent alternatives are alternative actions that can be implemented in a manner consistent with the scope of the Federal agency's legal authority and jurisdiction, that are economically and technologically feasible, and that would avoid jeopardizing the continued existence of listed species or resulting in adverse modification of critical habitat. A Federal agency and an applicant may elect to implement a reasonable and prudent alternative associated with a biological opinion that has found jeopardy or adverse modification of critical habitat. An agency or applicant could alternatively choose to seek an exemption from the requirements of the Act or proceed without implementing the reasonable and prudent alternative. However, unless an exemption were obtained, the Federal agency or applicant would be at risk of violating section 7(a)(2) of the Act if it chose to proceed without implementing the reasonable and prudent alternatives. Secondly, if we find that a proposed action is not likely to jeopardize the continued existence of a listed animal species, we may identify reasonable and prudent measures designed to minimize the amount or extent of take and require the Federal agency or applicant to implement such measures through non-discretionary terms and conditions. However, the Act does not prohibit the take of listed plant species or require terms and conditions to minimize adverse effect to critical habitat. We may also identify discretionary conservation recommendations designed to minimize or avoid the adverse effects of a proposed action on listed species or critical habitat, help implement recovery plans, or to develop information that could contribute to the recovery of the species.

Based on our experience with section 7 consultations for all listed species, virtually all projects—including those that, in their initial proposed form, would result in jeopardy or adverse modification determinations in section 7 consultations—can be implemented successfully with, at most, the adoption of reasonable and prudent alternatives. These measures must be economically feasible and within the scope of authority of the Federal agency involved in the consultation. As we have a limited consultation history for these 99 species from Oahu, we can only describe the general kinds of actions that may be identified in future reasonable and prudent alternatives. These are based on our understanding of the needs of these species and the threats they face, especially as described in the final listing rules and in this proposed critical habitat designation, as well as our experience with similar listed plants in Hawaii. In addition, all of these species are protected under the State of Hawaii's Endangered Species Act (Hawaii Revised Statutes, Chap. 195D–4). Therefore, we have also considered the kinds of actions required under the State licensing process for these species. The kinds of actions that may be included in future reasonable and prudent alternatives include conservation set-asides, management of competing non-native species, restoration of degraded habitat, propagation, outplanting and augmentation of existing populations, construction of protective fencing, and periodic monitoring.

As required under section 4(b)(2) of the Act, we will conduct an analysis of the potential economic impacts of this proposed critical habitat designation, and will make that analysis available for public review and comment before finalizing these designations. However, court deadlines require us to publish this proposed rule before the economic analysis can be completed.

In summary, we have considered whether this proposed rule would result in a significant economic effect on a substantial number of small entities. It would not affect a substantial number of small entities. Approximately 35 percent of the lands proposed as critical habitat are on State of Hawaii lands. The State of Hawaii is not a small entity. Approximately 59 percent of the lands proposed as critical habitat are on private lands. Many of these parcels are located in areas where likely future land uses are not expected to result in Federal involvement or section 7 consultations. As discussed earlier, most of the private and State parcels within the proposed designation are currently being used for recreational and agricultural purposes and, therefore, are not likely to require any Federal authorization. In the remaining areas, Federal involvement—and thus section 7 consultations, the only trigger for economic impact under this rule—would be limited to a subset of the area proposed. The most likely future section 7 consultations resulting from this rule would be for informal consultations on federally funded land and water conservation projects, species-specific surveys and research projects, and watershed management and restoration projects sponsored by Natural Resources Conservation Service. These consultations would likely occur on only a subset of the total number of parcels and therefore not likely to affect a substantial number of small entities. This rule would result in project modifications only when proposed Federal activities would destroy or adversely modify critical habitat. While this may occur, it is not expected frequently enough to affect a substantial number of small entities. Even when it does occur, we do not expect it to result in a significant economic impact, as the measures included in reasonable and prudent alternatives must be economically feasible and consistent with the proposed action. Therefore, we are certifying that the proposed designation of critical habitat for the following species: *Abutilon sandwicense, Adenophorus periens*, *Alectryon macrococcus*, *Alsinidendron obovatum*, *Alsinidendron trinerve*, *Bonamia menziesii*, *Cenchrus agrimonioides*, *Centaurium sebaeoides*, *Chamaesyce celastroides* var. *kaenana*, *Chamaesyce deppeana*, *Chamaesyce herbstii*, *Chamaesyce kuwaleana*, *Chamaesyce rockii*, *Colubrina oppositifolia*, *Ctenitis squamigera*, *Cyanea acuminata*, *Cyanea crispa*, *Cyanea grimesiana* ssp. *grimesiana*, *Cyanea grimesiana* ssp. *obatae*, *Cyanea humboltiana*, *Cyanea koolauensis*, *Cyanea longiflora*, *Cyanea pinnatifida*, *Cyanea st.-johnii*, *Cyanea superba*, *Cyanea truncata*, *Cyperus trachysanthos*, *Cyrtandra dentata*, *Cyrtandra polyantha*, *Cyrtandra subumbellata*, *Cyrtandra viridiflora*, *Delissea subcordata*, *Diellia erecta*, *Diellia falcata*, *Diellia unisora*, *Diplazium molokaiense*, *Dubautia herbstobatae*, *Eragrostis fosbergii*, *Eugenia koolauensis*, *Euphorbia haeleeleana*, *Flueggea neowawraea*, *Gardenia mannii*, *Gouania meyenii*, *Gouania vitifolia*, *Hedyotis coriacea*, *Hedyotis degeneri*, *Hedyotis parvula*, *Hesperomannia arborescens*, *Hesperomannia arbuscula*, *Hibiscus*

brackenridgei, *Isodendrion laurifolium*, *Isodendrion longifolium*, *Isodendrion pyrifolium*, *Labordia cyrtandrae*, *Lepidium arbuscula*, *Lipochaeta lobata* var. *leptophylla*, *Lipochaeta tenuifolia*, *Lobelia gaudichaudii* ssp. *koolauensis*, *Lobelia monostachya*, *Lobelia niihauensis*, *Lobelia oahuensis*, *Lysimachia filifolia*, *Mariscus pennatiformis*, *Marsilea villosa*, *Melicope pallida*, *Melicope saint-johnii*, *Myrsine juddii*, *Neraudia angulata*, *Nototrichium humile*, *Pelea lydgatei*, *Peucedanum sandwicense*, *Phlegmariurus nutans*, *Phyllostegia hirsuta*, *Phyllostegia kaalaensis*, *Phyllostegia mollis*, *Phyllostegia parviflora*, *Plantago princeps*, *Platanthera holochila*, *Pteris lidgatei*, *Sanicula mariversa*, *Sanicula purpurea*, *Schiedea hookeri*, *Schiedea kaalae*, *Schiedea kealiae*, *Schiedea nuttallii*, *Sesbania tomentosa*, *Silene lanceolata*, *Silene perlmanii*, *Solanum sandwicense*, *Spermolepis hawaiiensis*, *Stenogyne kanehoana*, *Tetramolopium filiforme*, *Tetramolopium lepidotum* ssp. *lepidotum*, *Tetraplasandra gymnocarpa*, *Trematalobelia singularis*, *Urera kaalae*, *Vigna o-wahuensis*, *Viola chamissoniana* ssp. *chamissoniana*, and *Viola oahuensis* will not have a significant economic impact on a substantial number of small entities, and an initial regulatory flexibility analysis is not required. However, should the revised economic analysis of this rule indicate otherwise, we will revisit this determination.

Executive Order 13211

On May 18, 2001, the President issued Executive Order 13211 on regulations that significantly affect energy supply, distribution, and use. Executive Order 13211 requires agencies to prepare Statements of Energy Effects when undertaking certain actions. Although this rule is a significant regulatory action under Executive Order 12866, it is not expected to significantly affect energy supplies, distribution, or use. Therefore, this action is not a significant energy action and no Statement of Energy Effects is required.

Unfunded Mandates Reform Act (2 U.S.C. 1501 et seq.)

In accordance with the Unfunded Mandates Reform Act (2 U.S.C. *et seq.*):

(a) We believe this rule, as proposed, will not ''significantly or uniquely'' affect small governments. A Small Government Agency Plan is not required. Small governments will not be affected unless they propose an action requiring Federal funds, permits or other authorizations. Any such activities will require that the Federal agency ensure that the action will not adversely modify or destroy designated critical habitat. However, as discussed above, these actions are currently subject to equivalent restrictions through the listing protections of the species, and no further restrictions are anticipated to result from critical habitat designation of occupied areas. In our economic analysis, we will evaluate any impact of designating areas where section 7 consultations would not have occurred but for the critical habitat designation.

(b) This rule, as proposed, will not produce a Federal mandate on State or local governments or the private sector 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.

Takings

In accordance with Executive Order 12630 (''Government Actions and Interference with Constitutionally Protected Private Property Rights''), we have analyzed the potential takings implications of designating critical habitat for the 99 species from Oahu in a preliminary takings implication assessment. The takings implications assessment concludes that this proposed rule does not pose significant takings implications. Once the economic analysis is completed for this proposed rule, we will review and revise this preliminary assessment as warranted.

Federalism

In accordance with Executive Order 13132, the proposed rule does not have significant Federalism effects. A Federalism assessment is not required. In keeping with Department of Interior policy, we requested information from appropriate State agencies in Hawaii. The designation of critical habitat in areas currently occupied by one or more of the 99 plant species imposes no additional restrictions to those currently in place, and, therefore, has little incremental impact on State and local governments and their activities. The designation of critical habitat in unoccupied areas may require section 7 consultation on non Federal lands (where a Federal nexus occurs) that might otherwise not have occurred. However, there will be little additional impact on State and local governments and their activities because 17 of the 25 proposed critical habitat areas are occupied by at least one species. 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 specifically 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.

Civil Justice Reform

In accordance with Executive Order 12988, the Office of the Solicitor has determined that the rule does not unduly burden the judicial system and does meet the requirements of sections 3(a) and 3(b)(2) of the Order. We are proposing to designate critical habitat in accordance with the provisions of the Endangered Species Act. The 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 99 plant species.

Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.)

This rule does not contain any new collections of information that require approval by OMB under the Paperwork Reduction Act. This rule will not impose recordkeeping or reporting requirements on State or local governments, individuals, businesses, or organizations. An agency may not conduct or sponsor and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number.

National Environmental Policy Act

We have determined we do not need to prepare an Environmental Assessment and/or an Environmental Impact Statement as defined by the National Environmental Policy Act of 1969 in connection with regulations adopted pursuant to section 4(a) of the Endangered Species Act, as amended. We published a notice outlining our reason for this determination in the **Federal Register** on October 25, 1983 (48 FR 49244). This proposed determination does not constitute a major Federal action significantly affecting the quality of the human environment.

Government-to-Government Relationship With Tribes

In accordance with the President's memorandum of April 29, 1994, ''Government-to-Government Relations with Native American Tribal Governments'' (59 FR 22951) Executive Order 13175 and 512 DM 2, we readily acknowledge our responsibility to

communicate meaningfully with recognized Federal Tribes on a government-to-government basis. We have determined that there are no Tribal lands essential for the conservation of these 99 plant species. Therefore, designation of critical habitat for these 99 species has not been proposed on Tribal lands.

References Cited

A complete list of all references cited in this proposed rule is available upon request from the Pacific Islands Office (see **ADDRESSES** section).

Author(s)

The primary authors of this notice are Michelle Stephens and Christa Russell (see **ADDRESSES** section).

List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Reporting and recordkeeping requirements, and 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 *Abutilon sandwicense, Alectryon macrococcus, Alsinidendron obovatum, Alsinidendron trinerve, Bonamia menziesii, Cenchrus agrimonioides, Centaurium sebaeoides, Chamaesyce celastroides* var. *kaenana, Chamaesyce deppeana, Chamaesyce herbstii, Chamaesyce kuwaleana, Chamaesyce rockii, Colubrina oppositifolia, Cyanea acuminata, Cyanea (-Rollandia) crispa, Cyanea grimesiana* ssp. *grimesiana, Cyanea grimesiana* ssp. *obatae, Cyanea humboldtiana, Cyanea koolauensis, Cyanea longiflora, Cyanea pinnatifida, Cyanea st.-johnii, Cyanea superba, Cyanea truncata, Cyperus trachysanthos, Cyrtandra dentata, Cyrtandra polyantha, Cyrtandra subumbellata, Cyrtandra viridiflora, Delissea subcordata, Dubautia herbstobatae, Eragrostis fosbergii, Eugenia koolauensis, Euphorbia haeleeleana, Flueggea neowawraea, Gardenia mannii, Gouania meyenii, Gouania vitifolia, Hedyotis coriacea, Hedyotis degeneri, Hedyotis parvula, Hesperomannia arborescens, Hesperomannia arbuscula, Hibiscus brackenridgei, Isodendrion laurifolium, Isodendrion longifolium, Isodendrion pyrifolium, Labordia cyrtandrae, Lepidium arbuscula, Lipochaeta lobata* var. *leptophylla, Lipochaeta tenuifolia, Lobelia gaudichaudii* ssp. *koolauensis, Lobelia monostachya, Lobelia niihauensis, Lobelia oahuensis, Lysimachia filifolia, Mariscus pennatiformis, Melicope lydgatei, Melicope pallida, Melicope saint-johnii, Myrsine juddii, Neraudia angulata, Nototrichium humile, Peucedanum sandwicense, Phyllostegia hirsuta, Phyllostegia kaalaensis, Phyllostegia mollis, Phyllostegia parviflora, Plantago princeps, Platanthera holochila, Sanicula mariversa, Sanicula purpurea, Schiedea hookeri, Schiedea kaalae, Schiedea kealiae, Schiedea nuttallii, Sesbania tomentosa, Silene lanceolata, Silene perlmanii, Solanum sandwicense, Spermolepis hawaiiensis, Stenogyne kanehoana, Tetramolopium filiforme, Tetramolopium lepidotum* ssp. *lepidotum, Tetraplasandra gymnocarpa, Trematalobelia singularis, Urera kaalae, Vigna o-wahuensis, Viola chamissoniana* ssp. *chamissoniana,* and *Viola oahuensis* under ''*FLOWERING PLANTS*'' and *Adenophorus periens, Ctentitis squamigera, Diellia erecta, Diellia falcata, Diellia unisora, Diplazium molokaiense, Lycopodium (-Phlegmariurus) nutans, Marsilea villosa,* and *Pteris lidgatei,* under ''FERNS AND ALLIES'' to read as follows:

§ 17.12 Endangered and threatened plants.

* * * * *

(h) * * *

Species		Historic range	Family	Status	When listed	Critical habitat	Special rules
Scientific name	Common name						
FLOWERING PLANTS							
*	*	*	*	*	*	*	
Abutilon sandwicense.	No common name ..	U.S.A. (HI)	Malvaceae	E	448	17.96(a)	NA
*	*	*	*	*	*	*	
Alectryon macrococcus.	Mahoe	U.S.A. (HI)	Sapindaceae	E	467	17.96(a)	NA
*	*	*	*	*	*	*	
Alsinidendron obovatum.	No common name ..	U.S.A. (HI)	Caryophyllaceae	E	448	17.96(a)	NA
Alsinidendron trinerve.	No common name ..	U.S.A. (HI)	Caryophyllaceae	E	448	17.96(a)	NA
*	*	*	*	*	*	*	
Bonamia menziesii ..	No common name ..	U.S.A. (HI)	Convolvulaceae	E	559	17.96(a)	NA
*	*	*	*	*	*	*	
Cenchrus agrimonioides.	Kamanomano	U.S.A. (HI)	Poaceae	E	592	17.96(a)	NA
*	*	*	*	*	*	*	
Centaurium, sebaeoides.	Awiwi	U.S.A. (HI)	Gentianaceae	E	448	17.96(a)	NA

Species		Historic range	Family	Status	When listed	Critical habitat	Special rules
Scientific name	Common name						
*	*	*	*	*	*		*
Chamaesyce celastroides var. *kaenana*.	Akoko	U.S.A. (HI)	Euphorbiaceae	E	448	17.96(a)	NA
*	*	*	*	*	*		*
Chamaesyce deppeana.	Akoko	U.S.A. (HI)	Euphorbiaceae	E	536	17.96(a)	NA
*	*	*	*	*	*		*
Chamaesyce herbstii	Akoko	U.S.A. (HI)	Euphorbiaceae	E	591	1796(a)	NA
*	*	*	*	*	*		*
Chamaesyce kuwaleana.	Akoko	U.S.A. (HI)	Euphorbiaceae	E	448	17.96(a)	NA
Chamaesyce rockii	Akoko	U.S.A. (HI)	Euphorbiaceae	E	591	17.96(a)	NA
*	*	*	*	*	*		*
Colubrina oppositifolia.	Kauila	U.S.A. (HI)	Rhamnaceae	E	532	17.96(a)	NA
*	*	*	*	*	*		*
Cyanea acuminata	Haha	U.S.A. (HI)	Campanulaceae	E	591	17.96(a)	NA
*	*	*	*	*	*		*
Cyanea (*Rollandia*) *crispa*.	Haha	U.S.A. (HI)	Campanulaceae	E	536	17.96(a)	NA
*	*	*	*	*	*		*
Cyanea grimesiana ssp. *grimesiana*.	Haha	U.S.A. (HI)	Campanulaceae	E	592	17.96(a)	NA
Cyanea grimesiana ssp. *obatae*.	Haha	U.S.A. (HI)	Campanulaceae	E	541	17.96(a)	NA
*	*	*	*	*	*		*
Cyanea humboldtiana.	Haha	U.S.A. (HI)	Campanulaceae	E	591	17.96(a)	NA
Cyanea koolauensis	Haha	U.S.A. (HI)	Campanulaceae	E	591	17.96(a)	NA
*	*	*	*	*	*		*
Cyanea longiflora	Haha	U.S.A. (HI)	Campanulaceae	E	591	17.96(a)	NA
*	*	*	*	*	*		*
Cyanea pinnatifida	Haha	U.S.A. (HI)	Campanulaceae	E	448	17.96(a)	NA
*	*	*	*	*	*		*
Cyanea st.-johnii	Haha	U.S.A. (HI)	Campanulaceae	E	591	17.96(a)	NA
*	*	*	*	*	*		*
Cyanea superba	Haha	U.S.A. (HI)	Campanulaceae	E	434	17.96(a)	NA
Cyanea truncata	Haha	U.S.A. (HI)	Campanulaceae	E	536	17.96(a)	NA
*	*	*	*	*	*		*
Cyperus trachysanthos.	Puukaa	U.S.A. (HI)	Cyperaceae	E	592	17.96(a)	NA
	*	*	* *	*	*		*
Cyrtandra dentata	Haiwale	U.S.A. (HI)	Gesneriaceae	E	591	17.96(a)	NA
	*	*	* *	*	*		*
Cyrtandra polyantha	Haiwale	U.S.A. (HI)	Gesneriaceae	E	536	17.96(a)	NA
Cyrtandra subumbellata.	Haiwale	U.S.A. (Hi)	Gesneriaceae	E	591	17.96(a)	NA
	*	*	* *	*	*		*
Cyrtandra viridiflora	Haiwale	U.S.A. (HI)	Gesneriaceae	E	591	17.96(a)	NA

Species		Historic range	Family	Status	When listed	Critical habitat	Special rules
Scientific name	Common name						
*	*	*	*	*	*	*	
Delissea subcordata	No common name ..	U.S.A. (HI)	Campanulaceae	E	591	17.96(a)	NA
*	*	*	*	*	*	*	
Dubautia herbstobatae.	Naenae	U.S.A. (HI)	Asteraceae	E	448	17.96(a)	NA
*	*	*	*	*	*	*	
Eragrostis fosbergii ..	No common name ..	U.S.A. (HI)	Poaceae	E	591	17.96(a)	NA
*	*	*	*	*	*	*	
Eugenia koolauensis	Nioi	U.S.A. (HI)	Myrtaceae	E	536	17.96(a)	NA
*	*	*	*	*	*	*	
Euphorbia haeleeleana.	Akoto	U.S.A. (HI)	Euphorbiaceae	E	592	17.96(a)	NA
*	*	*	*	*	*	*	
Flueggea neowawraea.	Mehamehame	U.S.A. (HI)	Euphorbiaceae	E	559	17.96(a)	NA
*	*	*	*	*	*	*	
Gardenia mannii	Nanu	U.S.A. (HI)	Rubiaceae	E	591	17.96(a)	NA
*	*	*	*	*	*	*	
Gouania meyenii	No common name ..	U.S.A. (HI)	Rhamnaceae	E	448	17.96(a)	NA
Gouania vitifolia	No common name ..	U.S.A. (HI)	Rhamnaceae	E	541	17.96(a)	NA
*	*	*	*	*	*	*	
Hedyotis coriacea	Kioele	U.S.A. (HI)	Rubiaceae	E	467	17.96(a)	NA
Hedyotis degeneri	No common name ..	U.S.A. (HI)	Rubiaceae	E	448	17.96(a)	NA
*	*	*	*	*	*	*	
Hedyotis parvula	No common name ..	U.S.A. (HI)	Rubiaceae	E	448	17.96(a)	NA
*	*	*	*	*	*	*	
Hesperomannia arborescens.	No common name ..	U.S.A. (HI)	Asteraceae	E	536	17.96(a)	NA
Hesperomannia arbuscula.	No common name ..	U.S.A. (HI)	Asteraceae	E	448	17.96(a)	NA
*	*	*	*	*	*	*	
Hibiscus brackenridgei.	Mao hau hele	U.S.A. (HI)	Malvaceae	E	559	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
Isodendtion pyrifolium.	Wahine none kula ..	U.S.A. (HI)	Violaceae	E	532	17.96(a)	NA
*	*	*	*	*	*	*	
Labordia cyrtandrae	Kamakahala	U.S.A. (HI)	Longaniaceae	E	591	17.96(a)	NA

Species		Historic range	Family	Status	When listed	Critical habitat	Special rules
Scientific name	Common name						
*	*	*	*	*	*	*	
Lepidium arbuscula	Anaunau	U.S.A. (HI)	Brassicaceae	E	591	17.96(a)	NA
*	*	*	*	*	*	*	
Lipochaeta lobata var. *leptophylla*.	Nehe	U.S.A. (HI)	Asteraceae	E	448	17.96(a)	NA
*	*	*	*	*	*	*	
Lipochaeta tenuifolia	Nehe	U.S.A. (HI)	Asteraceae	E	448	17.96(a)	NA
*	*	*	*	*	*	*	
Lobelia gaudichaudii ssp. *koolauensis*.	No common name	U.S.A. (HI)	Campanulaceae	E	591	17.96(a)	NA
Lobelia monostachya	No common name	U.S.A. (HI)	Campanulaceae	E	591	17.96(a)	NA
Lobelia niihauensis	No common name	U.S.A. (HI)	Campanulaceae	E	448	17.96(a)	NA
Lobelia oahuensis	No common name	U.S.A. (HI)	Campanulaceae	E	536	17.96(a)	NA
*	*	*	*	*	*	*	
Lysimachia filifolia	No common name	U.S.A. (HI)	Primulaceae	E	530	17.96(a)	NA
*	*	*	*	*	*	*	
Mariscus pennatiformis.	No common name	U.S.A. (HI)	Cyperaceae	E	559	17.96(a)	NA
*	*	*	*	*	*	*	
Melicope lydgatei	Alani	U.S.A. (HI)	Rutaceae	E	536	17.96(a)	NA
*	*	*	*	*	*	*	
Melicope pallida	Alani	U.S.A. (HI)	Rutaceae	E	530	17.96(a)	NA
*	*	*	*	*	*	*	
Melicope saint-johnii	Alani	U.S.A. (HI)	Rutaceae	E	591	17.96(a)	NA
*	*	*	*	*	*	*	
Myrsine juddii	Kolea	U.S.A. (HI)	Myrsinaceae	E	591	17.96(a)	NA
*	*	*	*	*	*	*	
Neraudia angulata	No common name	U.S.A. (HI)	Urticaceae	E	448	17.96(a)	NA
*	*	*	*	*	*	*	
Nototrichium humile	Kului	U.S.A. (HI)	Solanaceae	E	448	17.96(a)	NA
*	*	*	*	*	*	*	
Peucedanum sandwicense.	Makou	U.S.A. (HI)	Apiaceae	T	530	17.96(a)	NA
*	*	*	*	*	*	*	
Phyllostegia hirsuta	No common name	U.S.A. (HI)	Lamiaceae	E	591	17.96(a)	NA
Phyllostegia kaalaensis.	No common name	U.S.A. (HI)	Lamiaceae	E	591	17.96(a)	NA
*	*	*	*	*	*	*	
Phyllostegia mollis	No common name	U.S.A. (HI)	Lamiaceae	E	448	17.96(a)	NA
Phyllostegia parviflora.	No common name	U.S.A. (HI)	Lamiaceae	E	592	17.96(a)	NA
*	*	*	*	*	*	*	
Plantago princeps	Laukahi kuahiwi	U.S.A. (HI)	Plantaginaceae	E	559	17.96(a)	NA
Platanthera holochila	No common name	U.S.A. (HI)	Orchidaceae	E	592	17.96(a)	NA
*	*	*	*	*	*	*	
Sanicula mariversa	No common name	U.S.A. (HI)	Apiaceae	E	448	17.96(a)	NA
Sanicula purpurea	No common name	U.S.A. (HI)	Apiaceae	E	592	17.96(a)	NA
*	*	*	*	*	*	*	
Schiedea hookeri	No common name	U.S.A. (HI)	Caryophyllaceae	E	592	17.96(a)	NA
Schiedea kaalae	No common name	U.S.A. (HI)	Caryophyllaceae	E	448	17.96(a)	NA
*	*	*	*	*	*	*	
Schiedea kealiae	No common name	U.S.A. (HI)	Caryophyllaceae	E	591	17.96(a)	NA

Species		Historic range	Family	Status	When listed	Critical habitat	Special rules
Scientific name	Common name						
*	*	*	*	*	*		*
Schiedea nuttallii	No common name ..	U.S.A. (HI)	Caryophyllaceae	E	592	17.96(a)	NA
*	*	*	*	*	*		*
Sesbania tomentosa	Ohai	U.S.A. (HI)	Fabaceae	E	559	17.96(a)	NA
*	*	*	*	*	*		*
Silene lanceolata	No common name ..	U.S.A. (HI)	Caryophyllaceae	E	480	17.96(a)	NA
Silene perlmanii	No comon name	U.S.A. (HI)	Caryophyllaceae	E	448	17.96(a)	NA
*	*	*	*	*	*		*
Solanum sandwicense.	Aiakeakua, Popolo	U.S.A. (HI)	Solanaceae	E	530	17.96(a)	NA
*	*	*	*	*	*		*
Spermolepis hawaiiensis.	No common name ..	U.S.A. (HI)	Apiacea	E	559	17.96(a)	NA
*	*	*	*	*	*		*
Stenogyne kanehoana.	No common name ..	U.S.A. (HI)	Lamiaceae	E	466	17.96(a)	NA
*	*	*	*	*	*		*
Tetramolopium filiforme.	No common name ..	U.S.A. (HI)	Asteraceae	E	448	17.96(a)	NA
Tetramolopium lepidotum ssp. *lepidotum*.	No common name ..	U.S.A. (HI)	Asteraceae	E	448	17.96(a)	NA
*	*	*	*	*	*		*
Tetraplasandra gymnocarpa.	Oheohe	U.S.A. (HI)	Asteraceae	E	536	17.96(a)	NA
*	*	*	*	*	*		*
Trematolobelia singularis.	No common name ..	U.S.A. (HI)	Campanulaceae	E	591	17.96(a)	NA
*	*	*	*	*	*		*
Urera kaalae	Opuhe	U.S.A. (HI)	Urticaceae	E	448	17.96(a)	NA
*	*	*	*	*	*		*
Vigna o-wahuensis ..	No common name ..	U.S.A. (HI)	Fabaceae	E	559	17.96(a)	NA
Viola chamissoniana ssp. *chamissoniana*.	Olopu	U.S.A. (HI)	Violaceae	E	448	17.96(a)	NA
*	*	*	*	*	*		*
Viola oahuensis	No common name ..	U.S.A. (HI)	Violaceae	E	591	17.96(a)	NA
*	*	*	*	*	*		*
FERNS AND ALLIES							
Adenophorus periens	Pendant kihi fern	U.S.A. (HI)	Grammitidaceae	E	559	17.96(a)	NA
*	*	*	*	*	*		*
Ctenitis squamigera	Pauoa	U.S.A. (HI)	Aspleniaceae	E	553	17.96(a)	NA
*	*	*	*	*	*		*
Diellia erecta	No common name ..	U.S.A. (HI)	Aspleniaceae	E	559	17.96(a)	NA
Dielllia falcata	No common name ..	U.S.A. (HI)	Aspleniacea	E	448	17.96(a)	NA
Diellia unisora	No common name ..	U.S.A. (HI)	Aspleniaceae	E	541	17.96(a)	NA
Diplazium molokaiense.	No common name ..	U.S.A. (HI)	Aspleniaceae	E	553	17.96(a)	NA
*	*	*	*	*	*		*
Marsilea villosa	Ihiihi	U.S.A. (HI)	Marsiliaceae	E	474	17.96(a)	NA
*	*	*	*	*	*		*
Phlegmariurus (*Lycopodium*) *nutans*.	Wawaeiole	U.S.A. (HI)	Lycopodiaceae	E	536	17.96(a)	NA
Pteris lidgatei	No common name ..	U.S.A. (HI)	Adiantaceae	E	553	17.96(a)	NA

Species		Historic range	Family	Status	When listed	Critical habitat	Special rules
Scientific name	Common name						
*	*	*	*	*	*		*

3. Section 17.96, as proposed to be amended at 65 FR 66865, November 7, 2000, 65 FR 79192 (December 18, 2000), 65 FR 82086 (December 27, 2000), 65 FR 83193 (December 29, 2000), 67 FR 4072 (January 28, 2002), 67 FR 9806 (March 4, 2002), 67 FR 15856 (April 3, 2002), 67 FR 16492 (April 5, 2002), 67 FR 34522 (May 14, 2002) and elsewhere in this issue of the **Federal Register** (Big Island Hawaii) is proposed to be further amended as follows:

a. Add paragraph (a)(1)(i)(I); and

b. Amend paragraph (a)(1)(ii)(A) and (B) by adding the entries set forth below.

§ 17.96 Critical habitat-plants.

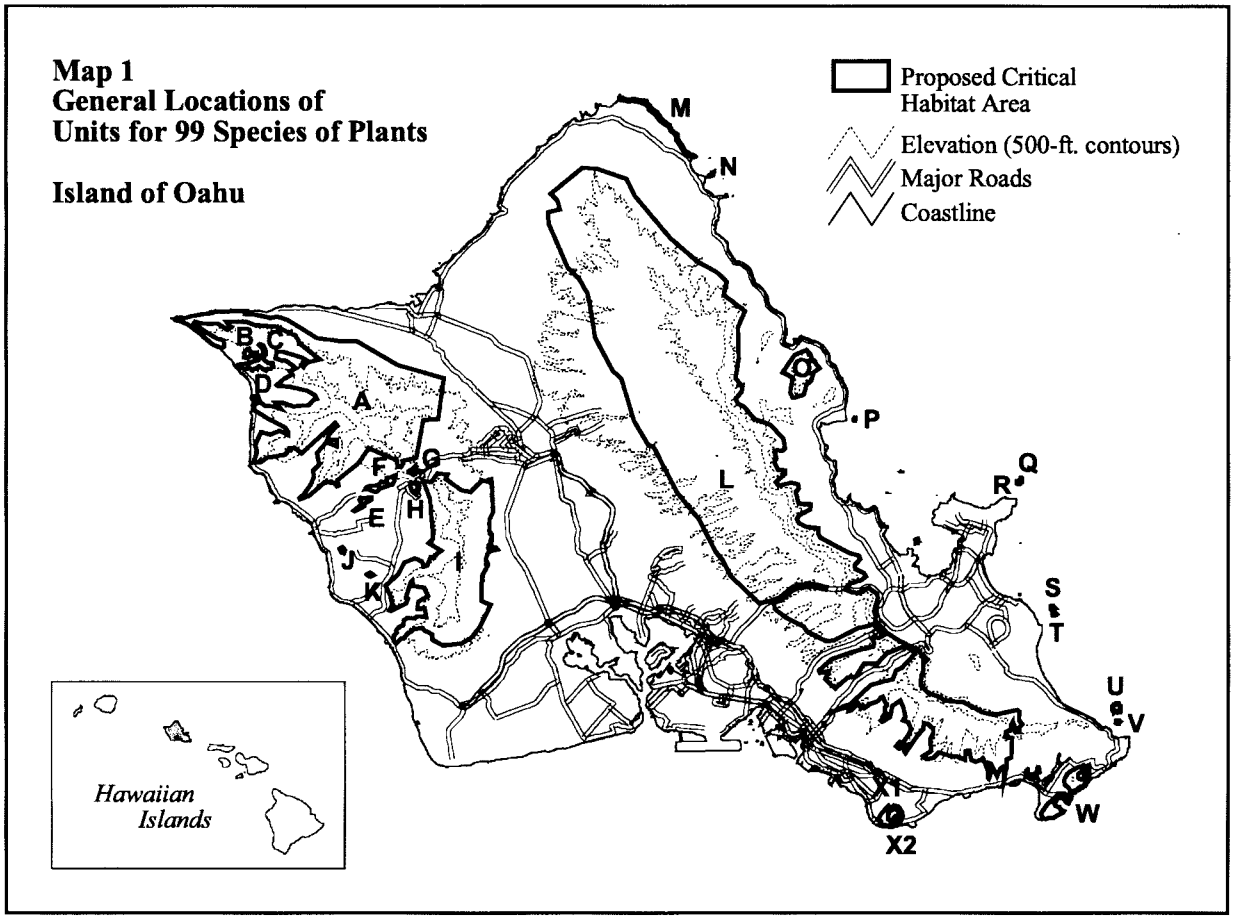
(a) * * *

(1) * * *

(*i*) Maintain *Maps and critical habitat unit descriptions.* The following sections contain the legal descriptions of the critical habitat units designated for each of the Hawaiian Islands. Existing manmade features and structures within the boundaries of the mapped units, such as buildings, roads, aqueducts, railroads, telecommunication equipment, telemetry antennas, radars, missile launch sites, arboreta and gardens, heiaus (indigenous place of worship, shrine), airports, other paved areas, lawns, and other rural residential landscaped areas do not contain one or more of the primary constituent elements described for each species in paragraphs (a)(1)(ii)(A) and (a)(1)(ii)(B) of this section and are not included in the critical habitat designation.

(I) *Oahu.* Critical habitat units are described below. Coordinates are in UTM Zone 5 with units in meters using North American Datum of 1983 (NAD83). The following map shows the general locations of the 25 critical habitats units designated on the island of Oahu.

(*1*) **Note:** Map 1—Index map follows:



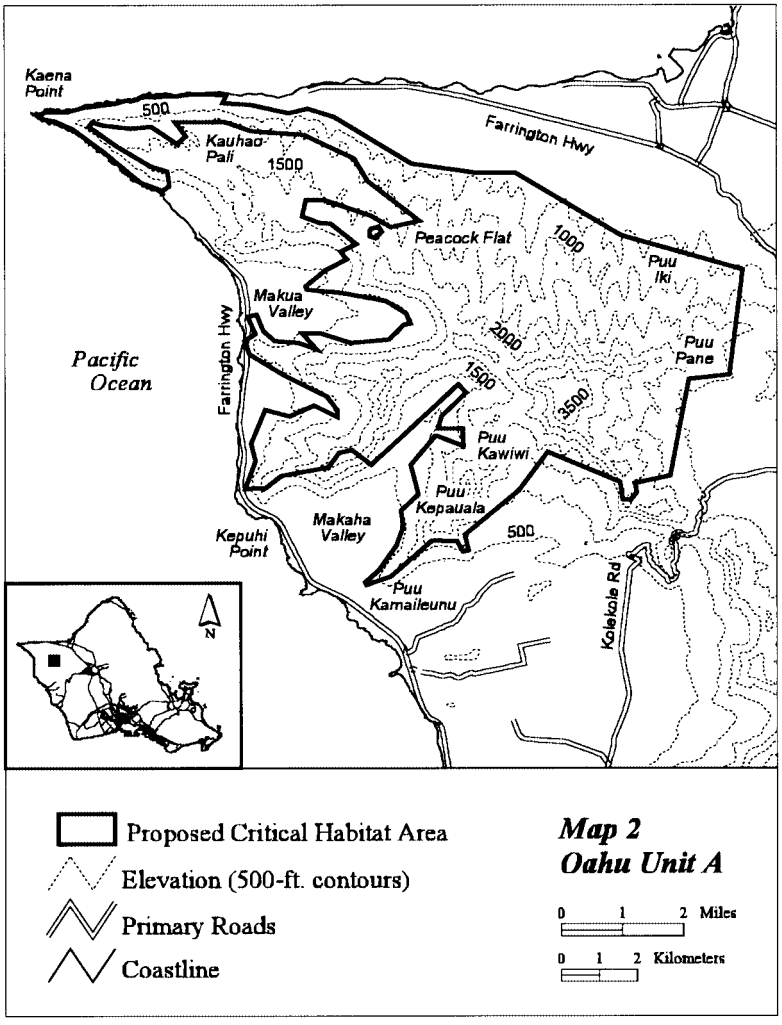
(*2*) Oahu A (8,504 ha, 21,013 ac).

(*i*) Unit consists of the following 129 boundary points: 584950, 2377432; 585671, 2377146; 585659, 2377618; 585016, 2377625; 585092, 2377943; 585733, 2378575; 585538, 2378784; 583246, 2376657; 582737, 2377043; 582396, 2376973; 582116, 2376586; 580873, 2376363; 580475, 2376039; 579928, 2376027; 580207, 2376763; 580077, 2377208; 580463, 2378115; 581095, 2377940; 581741, 2378223; 582348, 2377927; 582352, 2378103; 582079, 2378466; 580956, 2379031; 580053, 2379577; 579916, 2379943;

580195, 2380119; 579990, 2380577; 580239, 2380639; 580400, 2380204; 580711, 2379943; 581339, 2379885; 581818, 2379719; 581445, 2380141; 581917, 2380146; 582701, 2379888; 583715, 2379970; 584093, 2380363; 584290, 2380395; 584158, 2380660; 583632, 2380990; 582472, 2381212; 581560, 2381299; 581525, 2381376; 582048, 2381795; 582606, 2382084; 582448, 2382291; 582852, 2382503; 582190, 2383041; 581891, 2383049; 581445, 2383224; 581544, 2383659; 581994, 2383664; 583254, 2383233; 583771, 2382937; 584528, 2383106; 583163, 2384156; 582817, 2384756; 581496, 2385379; 580099, 2385471; 579431, 2385710; 578101, 2385710; 578396, 2385344; 578151, 2385138; 577468, 2385588; 576935, 2385536; 576208, 2385632; 575911, 2385714; 575829, 2385586; 576581, 2385071; 577457, 2384544; 577898, 2384416; 577948, 2384016; 577765, 2383898; 577185, 2384117; 576277, 2384883; 575412, 2385521; 574908, 2385747; 574600, 2385794; 574538, 2385893; 574683, 2385979; 575263, 2385990; 575698, 2386095; 576517, 2386212; 576821, 2386287; 576902, 2386302; 576929, 2386276; 577139, 2386330; 577147, 2386349; 577336, 2386382; 577539, 2386382; 577539, 2386383; 578164, 2386410; 578534, 2386464; 579454, 2386447; 579361, 2386220; 580107, 2386178; 581087, 2385955; 581593, 2386070; 582279, 2385848; 584310, 2384610; 585987, 2384377; 587049, 2384382; 589845, 2382717; 593031, 2381826; 592675, 2379038; 591610, 2378927; 591125, 2376370; 590184, 2376161; 590237, 2375925; 590078, 2375730; 589871, 2375739; 589804, 2376190; 587886, 2376990; 587134, 2375976; 585708, 2374809; 585805, 2374401; 585659, 2374361; 585509, 2374635; 584838, 2374660; 583757, 2373710; 583115, 2373484; 583076, 2373552; 583436, 2373865; 583905, 2374537; 584086, 2375018; 584030, 2375455; 584478, 2375878; 584279, 2376661; 584950, 2377432.

(*ii*) Excluding the area consisting of the following six boundary points (7 ha; 17 ac): 583216, 2382880; 583450, 2382956; 583543, 2382821; 583374, 2382640; 583216, 2382693; 583216, 2382880.

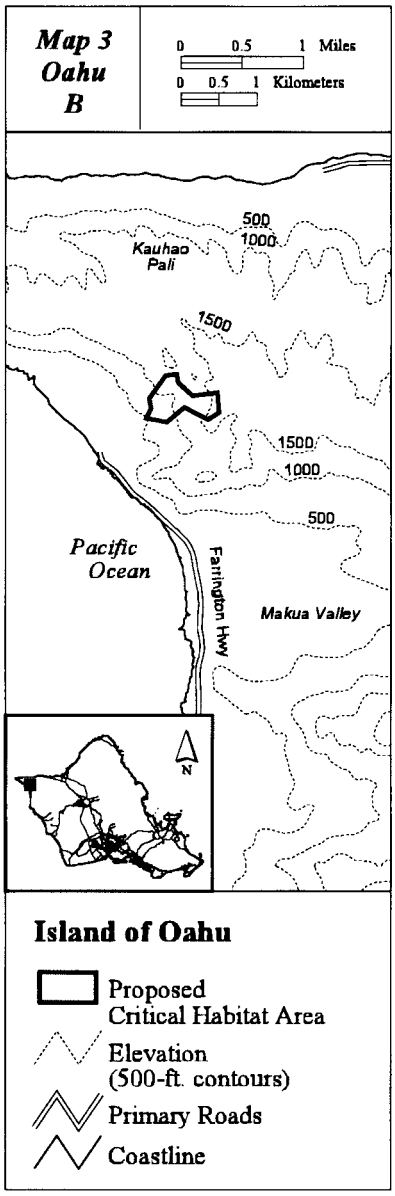
(*iii*) **Note:** Map 2 follows:



(*3*) Oahu B (34 ha, 83 ac).

(*i*) Unit consists of the following 13 boundary points: 579694, 2383749; 579887, 2383567; 580216, 2383613; 580233, 2383353; 580093, 2383252; 579781, 2383420; 579551, 2383218; 579281, 2383273; 579340, 2383412; 579313, 2383539; 579533, 2383839; 579678, 2383853; 579694, 2383749.

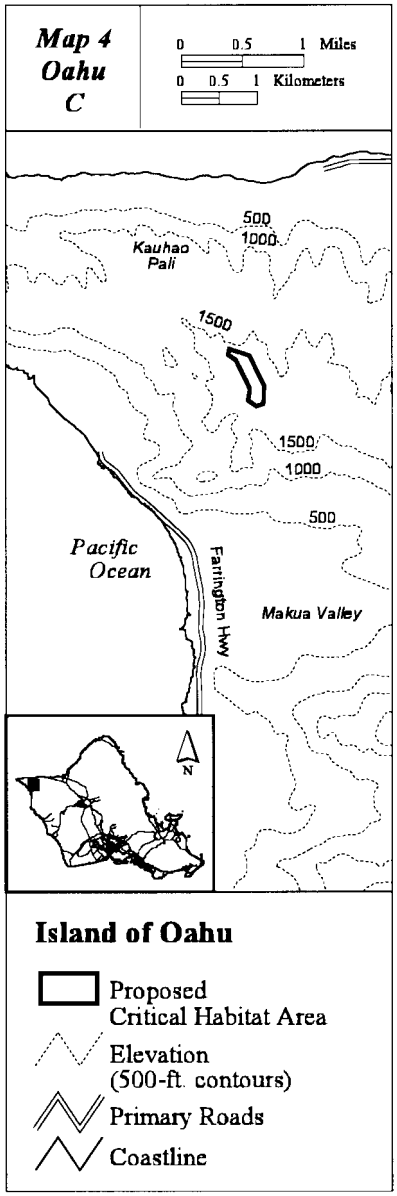
(*ii*) **Note:** Map 3 follows:



(*4*) Oahu C (14 ha, 35 ac).

(*i*) Unit consists of the following 10 boundary points: 580634, 2383658; 580448, 2384031; 580348, 2384103; 580359, 2384180; 580622, 2384091; 580816, 2383697; 580809, 2383460; 580717, 2383424; 580606, 2383503; 580634, 2383658.

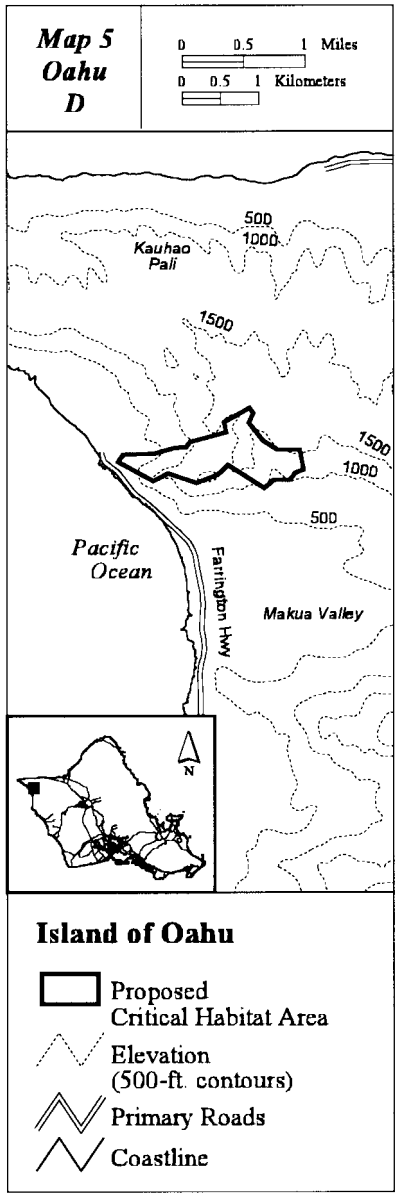
(*ii*) **Note:** Map 4 follows:



(*5*) Oahu D (110 ha, 271 ac).

(*i*) Unit consists of the following 25 boundary points: 580281, 2383222; 580606, 2383411; 580655, 2383344; 580602, 2383210; 580789, 2382976; 580968, 2382856; 581269, 2382857; 581319, 2382595; 581206, 2382556; 581138, 2382463; 580929, 2382460; 580805, 2382349; 580325, 2382658; 580194, 2382531; 579912, 2382420; 579539, 2382543; 579344, 2382444; 578880, 2382694; 578948, 2382793; 579364, 2382805; 579630, 2382884; 579781, 2382892; 579832, 2382960; 580303, 2383087; 580281, 2383222.

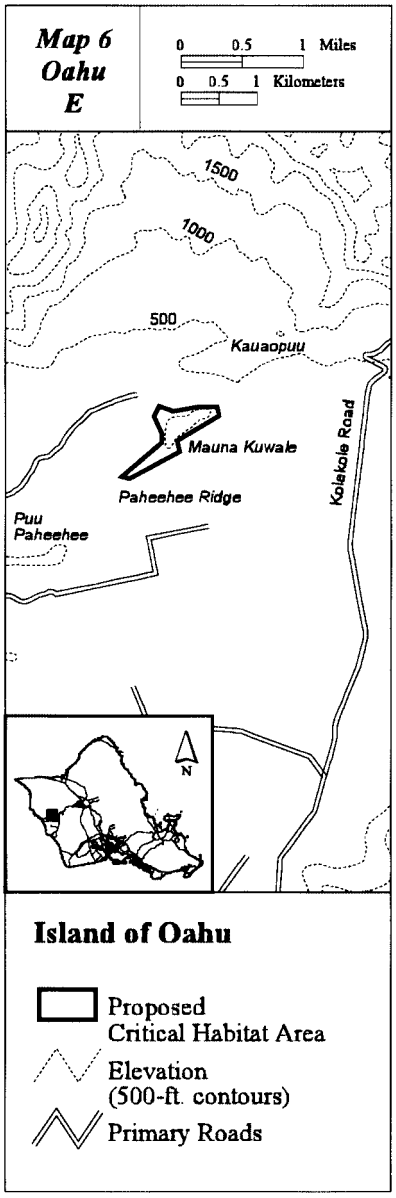
(*ii*) **Note:** Map 5 follows:



(*6*) Oahu E (38 ha, 94 ac).

(*i*) Unit consists of the following 13 boundary points: 587490, 2373552; 587822, 2373610; 588066, 2373607; 588093, 2373488; 587547, 2373162; 587575, 2373016; 586913, 2372659; 586819, 2372688; 587343, 2373135; 587340, 2373263; 587234, 2373485; 587305, 2373618; 587490, 2373552.

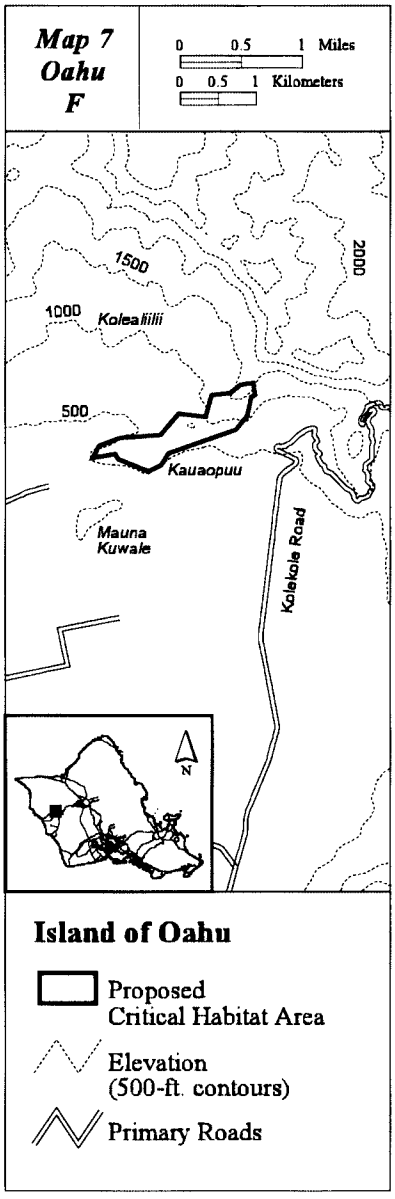
(*ii*) **Note:** Map 6 follows:



(*7*) Oahu F (81 ha, 200 ac).

(*i*) Unit consists of the following 20 boundary points: 587685, 2374312; 587953, 2374412; 588499, 2374458; 588734, 2374736; 589087, 2374687; 589164, 2374979; 589410, 2375004; 589548, 2375117; 589718, 2375138; 589743, 2374983; 589691, 2374952; 589636, 2374708; 589487, 2374525; 588596, 2374211; 588507, 2374058; 588331, 2373970; 587938, 2374132; 587898, 2374199; 587599, 2374147; 587685, 2374312.

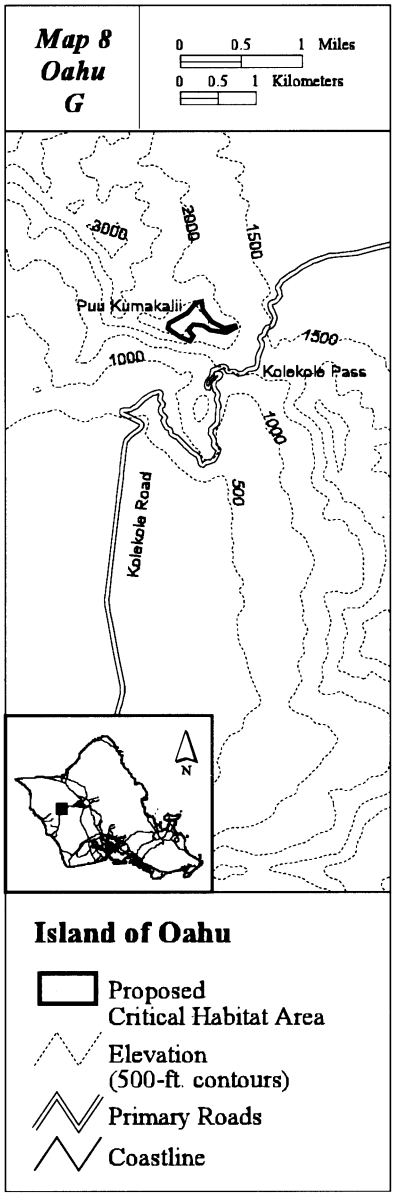
(*ii*) **Note:** Map 7 follows:



(*8*) Oahu G (16 ha, 40 ac).

(*i*) Unit consists of the following 19 boundary points: 590995, 2375723; 591072, 2375735; 591090, 2375622; 591212, 2375467; 591381, 2375387; 591513, 2375416; 591525, 2375393; 591395, 2375323; 591181, 2375356; 591100, 2375416; 590964, 2375432; 590898, 2375362; 590966, 2375282; 590921, 2375214; 590793, 2375263; 590625, 2375384; 590645, 2375451; 590888, 2375585; 590995, 2375723.

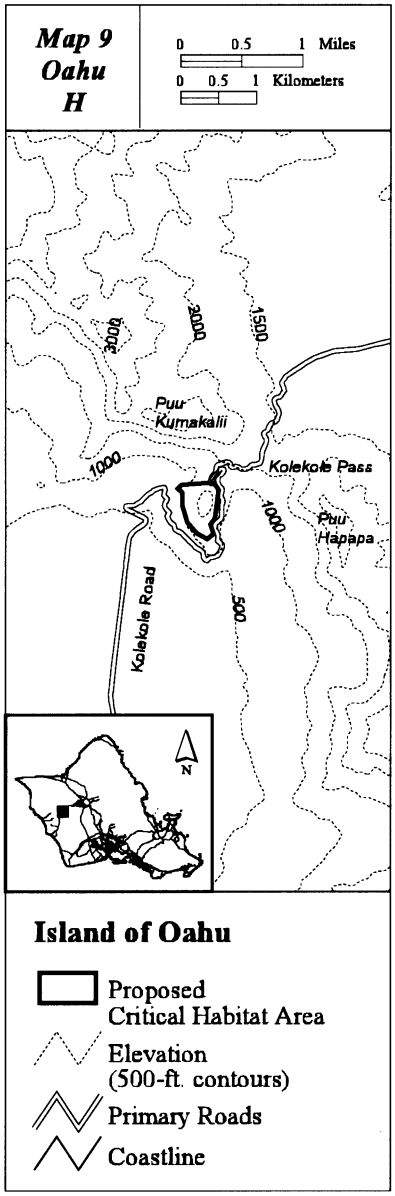
(*ii*) **Note:** Map 8 follows:



(*9*) Oahu H (28 ha, 68 ac).

(*i*) Unit consists of the following 14 boundary points: 590764, 2374307; 590763, 2374472; 590700, 2374526; 590756, 2374578; 591092, 2374606; 591195, 2374587; 591248, 2374509; 591194, 2374127; 591134, 2374054; 591180, 2373922; 591094, 2373854; 590957, 2373933; 590826, 2374078; 590764, 2374307.

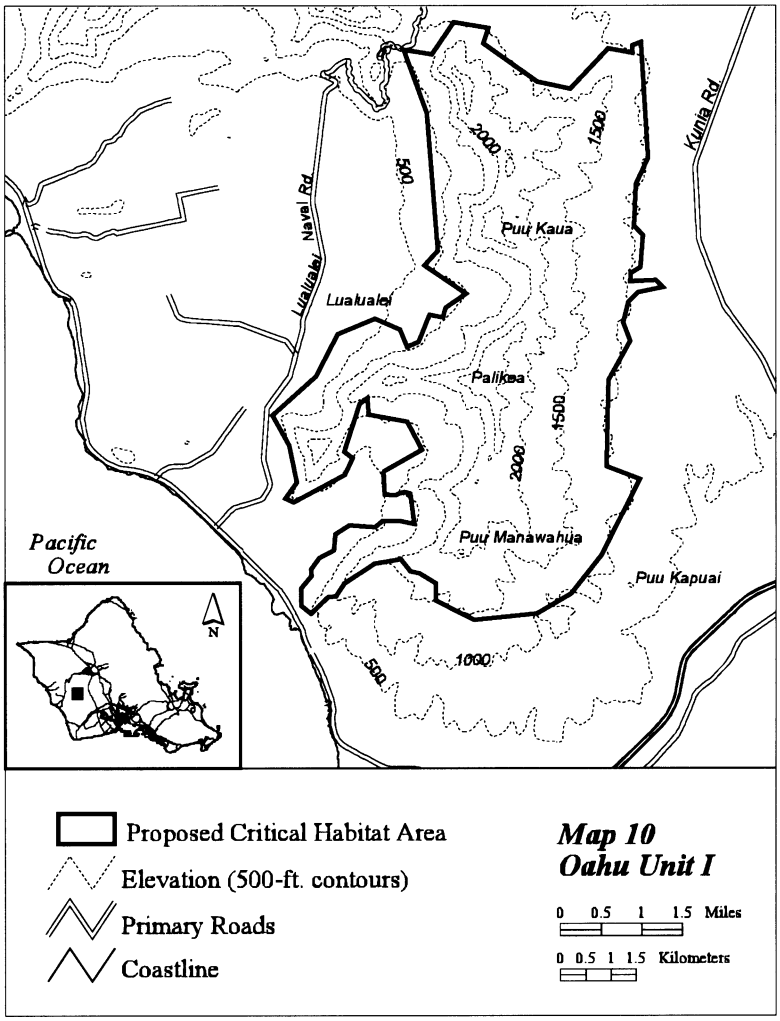
(*ii*) **Note:** Map 9 follows:



(*10*) Oahu I (5,108 ha, 12,623 ac).

(*i*) Unit consists of the following 88 boundary points: 591216, 2366381; 591982, 2366817; 591691, 2367372; 590921, 2367515; 590903, 2367852; 590740, 2367734; 590438, 2366785; 590602, 2366656; 590452, 2366324; 589437, 2365779; 589274, 2365854; 589506, 2366168; 589343, 2366913; 589024, 2367508; 589876, 2368279; 590308, 2369112; 591047, 2369419; 591542, 2369212; 591680, 2368861; 591915, 2368960; 592125, 2369494; 592399, 2369453; 592450, 2369644; 592858, 2369920; 592024, 2370471; 592290, 2370765; 592078, 2373499; 591626, 2374755; 592184, 2374670; 592614, 2375298; 593304, 2375183; 593191, 2374882; 594258, 2374119; 594913, 2373987; 595654, 2374786; 596144, 2374692; 596144, 2374844; 596305, 2374913; 596443, 2372614; 596207, 2372094; 596174, 2371267; 596352, 2371074; 596301, 2370442; 596100, 2370329; 596086, 2370155; 596604, 2370178; 596742, 2370040; 596249, 2369943; 596055, 2369758; 595948, 2369350; 596098, 2368982; 595665, 2368199; 595626, 2366488; 596281, 2366231; 595522, 2364723; 594929, 2363957; 594256, 2363568; 593002, 2363438; 592261, 2363823; 592254, 2364166; 591923, 2364366; 591746, 2364409; 591557, 2364645; 591037, 2364559; 590435, 2364159; 590272, 2363910; 590125, 2363901; 589781, 2363570; 589592, 2363721; 589588, 2364069; 589790, 2364314; 589786, 2364443; 589945, 2364675; 590241, 2364821; 590263, 2365140; 590539, 2365314; 591056, 2365277; 591200, 2365406; 591519, 2365415; 591827, 2365351; 591748, 2365947; 591738, 2365951; 591637, 2365979; 591602, 2365972; 591533, 2365957; 591460, 2365917; 591235, 2365936; 591216, 2366381.

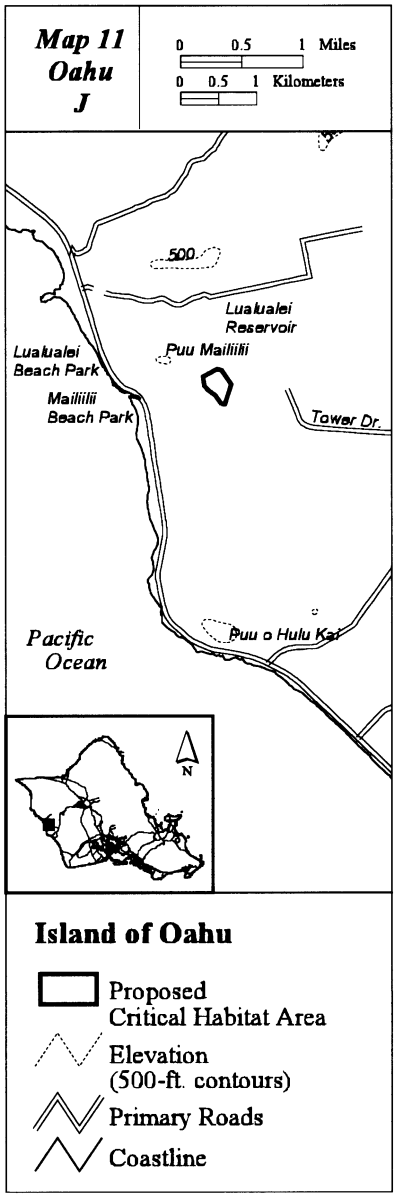
(*ii*) **Note:** Map 10 follows:


Kunia Rd
Navel Rd
Lualuaiei
Lualuaiei
500
2000
1500
Puu Kaua
Palikea
1500
2000
Puu Manawahua
Puu Kapuai
1000
500
Pacific Ocean
N
Proposed Critical Habitat Area
Elevation (500-ft. contours)
Primary Roads
Coastline
Map 10
Oahu Unit I
0 0.5 1 1.5 Miles
0 0.5 1 1.5 Kilometers

(*11*) Oahu J (10 ha, 25 ac).

(*i*) Unit consists of the following ten boundary points: 586105, 2369712; 586019, 2369826; 585929, 2369900; 585878, 2369958; 585860, 2370075; 586047, 2370180; 586105, 2370159; 586228, 2369973; 586148, 2369708; 586105, 2369712.

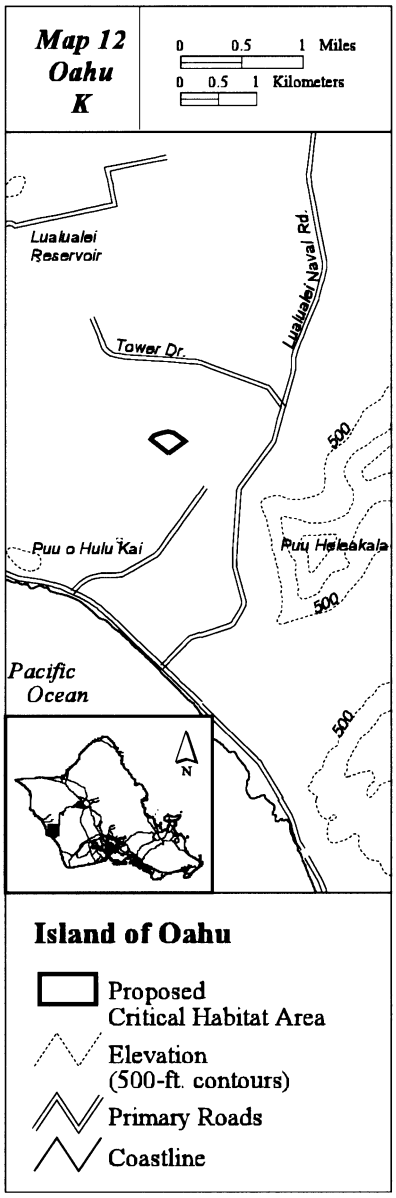
(*ii*) **Note:** Map 11 follows:



(*12*) Oahu K (7 ha, 18 ac).

(*i*) Unit consists of the following eight boundary points: 587975, 2368114; 587736, 2368302; 587784, 2368350; 587880, 2368389; 587969, 2368407; 588041, 2368390; 588193, 2368272; 587975, 2368114.

(*ii*) Note: Map 12 follows:

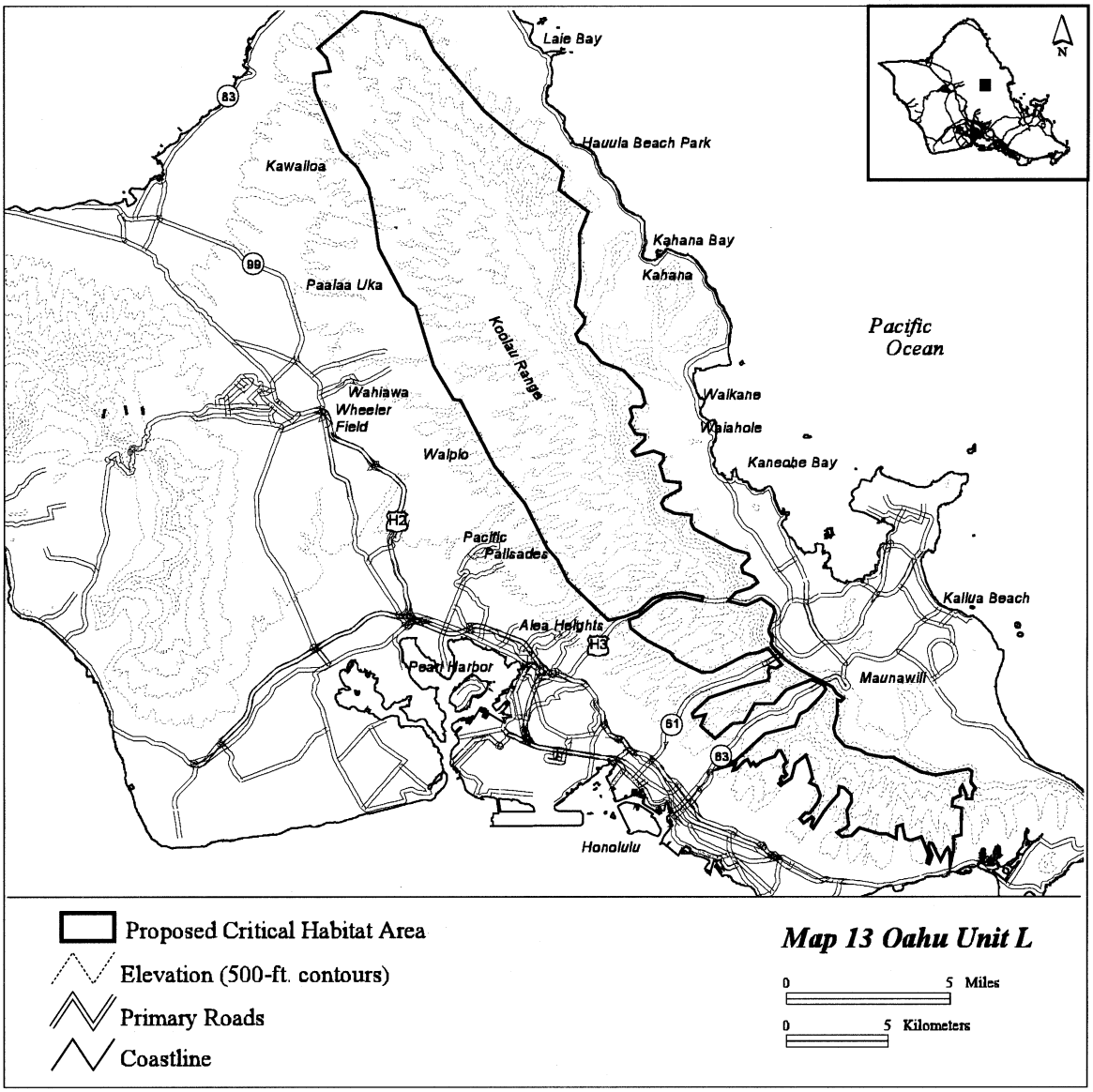


(*13*) Oahu L (30,068 ha, 74,301 ac).

(*i*) Unit consists of the following 247 boundary points: 630472, 2354716; 630100, 2355624; 629580, 2355419; 629301, 2355527; 629162, 2356203; 628907, 2356125; 628855, 2355534; 628391, 2355772; 628053, 2355755; 627070, 2356063; 626669, 2355661; 626214, 2355599; 625962, 2355819; 626440, 2356093; 626520, 2356196; 626441, 2356918; 626678, 2357357; 626649, 2357694; 626282, 2358028; 626067, 2358099; 626022, 2357714; 625616, 2357251; 625324, 2356852; 624769, 2356015; 624665, 2356158; 624810, 2356492; 624733, 2356592; 624312, 2356301; 624120, 2356499; 624386, 2356808; 624519, 2356754; 624644, 2356803; 625017, 2357329; 625143, 2357659; 624967, 2358116; 624604, 2358276; 624760, 2358514; 624614, 2359138; 624420, 2359643; 623879, 2359238; 623709, 2358524; 623169, 2358149; 623081, 2358237; 623229, 2358330; 623152, 2358462; 623235, 2358611; 623389, 2358572; 623477, 2358682; 623368, 2358806; 623323, 2359133; 623468, 2359271; 623191, 2359887; 623070, 2359870; 622882, 2359571; 622300, 2359375; 621959, 2359117; 621849, 2359276; 621711, 2359133; 621546, 2359436; 621383, 2359351; 621014, 2358958; 620851, 2358914; 620942, 2359237; 620122, 2358980; 620543, 2359252; 620950, 2359361; 622396, 2360697; 623890, 2361098; 624124, 2361689; 624497, 2361860; 625196, 2362592; 625395, 2362905; 625302, 2363098; 624704, 2363373; 623455, 2362882; 622842, 2362180; 621909, 2362178; 621370, 2361266; 620803, 2361210; 619955, 2360463; 619241, 2361098; 619485, 2361645; 618895, 2361516; 618817, 2361712; 619665, 2362481; 621304, 2363049; 622555, 2363345; 622625, 2363548; 622551, 2363798; 622638, 2363988; 622939, 2363923; 623240, 2364110; 622549, 2364906; 622070, 2364700; 621516, 2364619; 619844, 2363773; 619306, 2363732; 618018, 2364365; 617769, 2364712; 616590, 2365310; 616218, 2365592; 615788, 2365918; 615698, 2366342; 616146, 2366497; 616978, 2367173; 617442, 2367401; 618298, 2367467; 619284, 2367246; 619350, 2367450; 618298, 2367670; 617418, 2367589; 616872, 2367369; 616187, 2366749; 615502, 2366480; 614715, 2366305; 612726, 2368229; 612213, 2369265; 611690, 2369886; 610594, 2372095; 609095, 2373932; 607429, 2377141; 607076, 2377223; 606097, 2378881; 605220, 2381803; 604636, 2382351; 603415, 2384650; 603167, 2386304; 602914, 2387638; 602349, 2388646; 601544, 2389445; 600257, 2392431; 600187, 2393272; 601024, 2393410; 600830, 2394049; 600377, 2394522; 602551, 2396317; 603610, 2396217; 605573, 2395548; 606141, 2394360; 608595, 2391432; 610456, 2389829; 611781, 2389129; 612485, 2388484; 612286, 2387566; 613734, 2386451; 613275, 2385352; 613314, 2383180; 613082, 2381819; 613547, 2381214; 613507, 2380935; 613089, 2380404; 613241, 2380052; 613647, 2379899; 614362, 2379040; 615438, 2378645; 616347, 2377697; 616509, 2377025; 616330, 2376842; 615916, 2376860; 615761, 2376728; 615884, 2376328; 615745, 2376016; 616023, 2375527; 616498, 2375480; 616476, 2375235; 615846, 2374664; 616051, 2374429; 616922, 2374655; 617401, 2374499; 617428, 2374263; 617214, 2373976; 617446, 2373188; 618238, 2373106; 618224, 2372771; 617446, 2372342; 617311, 2372083; 617424, 2371813;

617953, 2371576; 618784, 2371489; 618773, 2371099; 618907, 2370820; 620838, 2369795; 621571, 2369604; 621650, 2369367; 621267, 2368961; 621323, 2368668; 621884, 2368434; 622056, 2368173; 621695, 2367902; 620962, 2367677; 620605, 2367259; 621160, 2367110; 621495, 2367050; 622240, 2367375; 622811, 2366967; 622868, 2366712; 622597, 2365765; 622759, 2365413; 622709, 2365156; 622784, 2364960; 623415, 2364346; 624146, 2363841; 625731, 2363030; 625923, 2362695; 626282, 2362445; 626140, 2362302; 625971, 2362363; 625953, 2361656; 625785, 2360976; 625863, 2360608; 626338, 2360087; 627103, 2359897; 627409, 2359692; 628198, 2359542; 628683, 2359547; 630084, 2358798; 630825, 2358657; 632432, 2358970; 632589, 2358852; 632556, 2358317; 632776, 2357999; 632629, 2357845; 632595, 2357490; 632325, 2357479; 632308, 2357738; 632117, 2358148; 632000, 2357971; 632038, 2357642; 631661, 2357473; 631618, 2357125; 632107, 2357040; 632062, 2355691; 631695, 2355601; 631703, 2355280; 631699, 2354977; 631532, 2354149; 631517, 2354916; 631428, 2355081; 631285, 2354916; 631057, 2354415; 630644, 2355292; 630484, 2355323; 630457, 2355102; 630644, 2354689; 630488, 2354267; 630389, 2354343; 630472, 2354716.

(*ii*) **Note:** Map 13 follows:

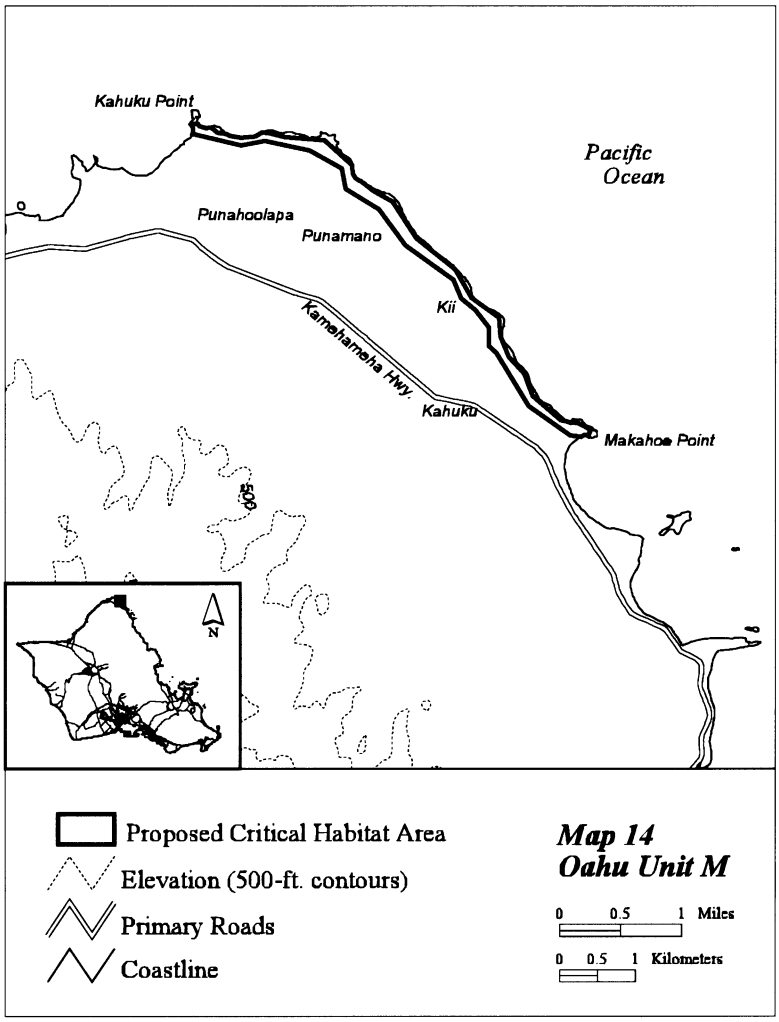


(*14*) Oahu M (100 ha, 246 ac).

(*i*) Unit consists of the following 66 boundary points: 605075, 2401114; 605050, 2401154; 605103, 2401171; 605130, 2401169; 605155, 2401135; 605240, 2401108; 605306, 2401120; 605397, 2401050; 605439, 2401040; 605516, 2401036; 605556, 2401006; 605705, 2400985; 605892, 2401002; 605974, 2401051; 606009, 2401054; 606082, 2401044; 606286, 2400994; 606487, 2400973; 606811, 2400952; 607170, 2400618; 607182, 2400505; 607216, 2400450; 607264, 2400416; 607294, 2400407; 607455, 2400278; 607707, 2400136; 608018, 2399654; 608529, 2399247; 608541, 2399223; 608541, 2399222; 608751, 2398862; 609109, 2398604; 609125, 2398360; 609242, 2398091; 609441, 2397864; 609549, 2397569; 609925, 2397252; 610007, 2397236; 610009, 2397234; 610053, 2397216; 610058, 2397227; 610160, 2397208; 610302, 2397128;

610310, 2397106; 610285, 2397037; 610265, 2397056; 610235, 2397053; 610193, 2397026; 610049, 2397044; 609503, 2397435; 609075, 2398137; 608976, 2398230; 608976, 2398474; 608798, 2398707; 608608, 2398855; 608506, 2399104; 607877, 2399558; 607524, 2400032; 607089, 2400309; 607033, 2400576; 606615, 2400810; 606022, 2400942; 605706, 2400878; 605065, 2401033; 605075, 2401060; 605075, 2401114.

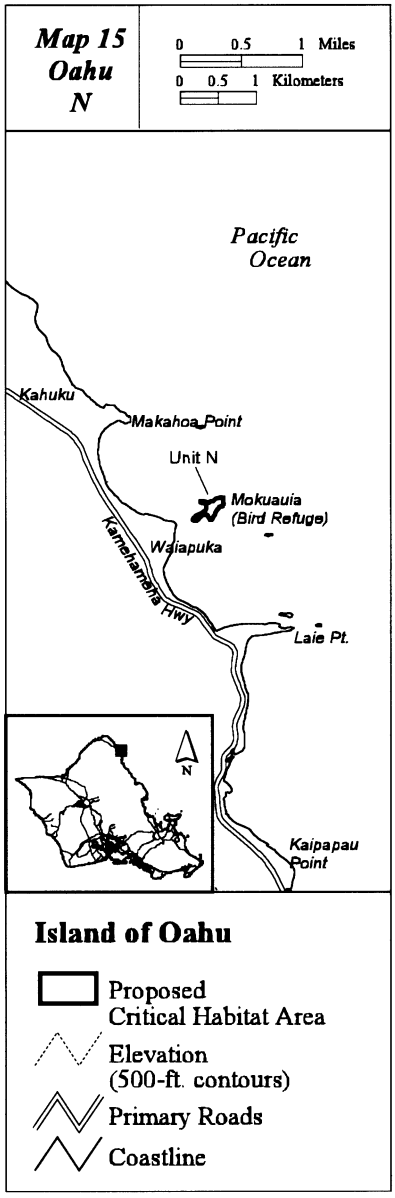
(*ii*) **Note:** Map 14 follows:



(*15*) Oahu N (5 ha, 12 ac).

(*i*) Unit consists of the entire offshore island located at approximately: 611477, 2395905.

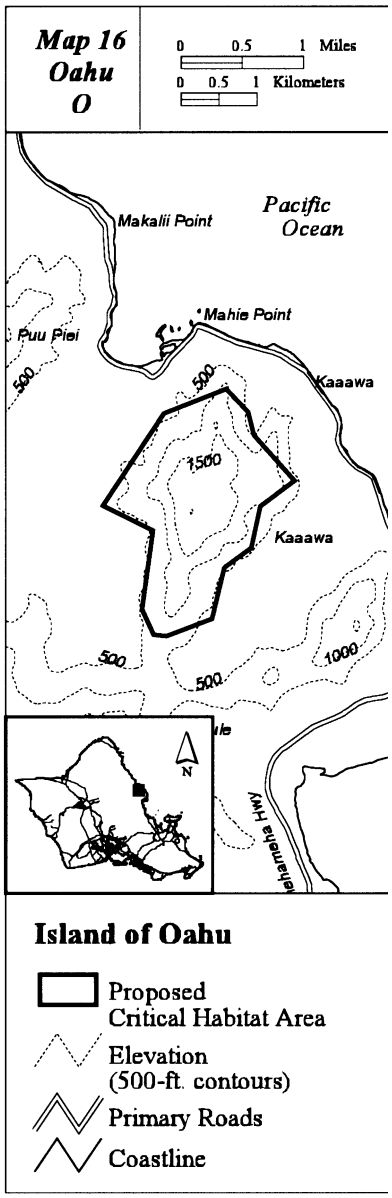
(*ii*) **Note:** Map 15 follows:



(*16*) Oahu O (431 ha, 1,066 ac).

(*i*) Unit consists of the following 15 boundary points: 617935, 2381391; 617776, 2380713; 617169, 2380478; 617006, 2380498; 616849, 2380834; 616997, 2381875; 616333, 2382207; 617139, 2383429; 617958, 2383753; 618243, 2383442; 618321, 2383143; 618857, 2382536; 618408, 2382201; 618290, 2381653; 617935, 2381391.

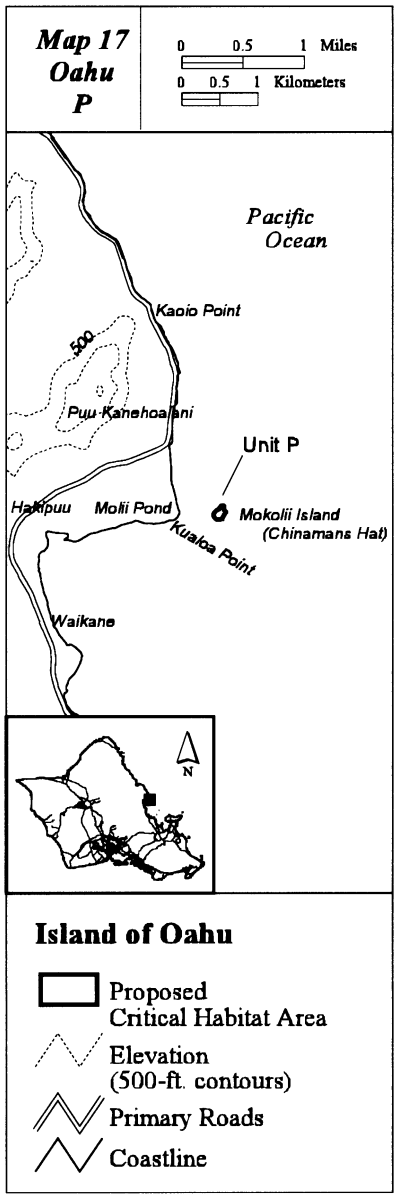
(*ii*) **Note:** Map 16 follows:



(*17*) Oahu P (2 ha, 3 ac).

(*i*) Unit consists of the entire offshore island located at approximately: 621249, 2378985.

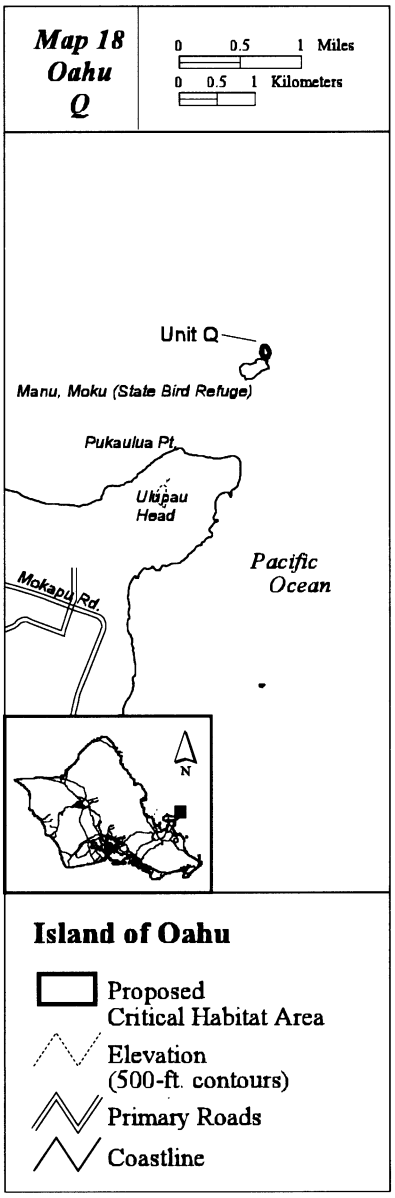
(*ii*) **Note:** Map 17 follows:



(*18*) Oahu Q (1 ha, 3 ac).

(*i*) Unit consists of the entire offshore island located at approximately: 632741, 2374904.

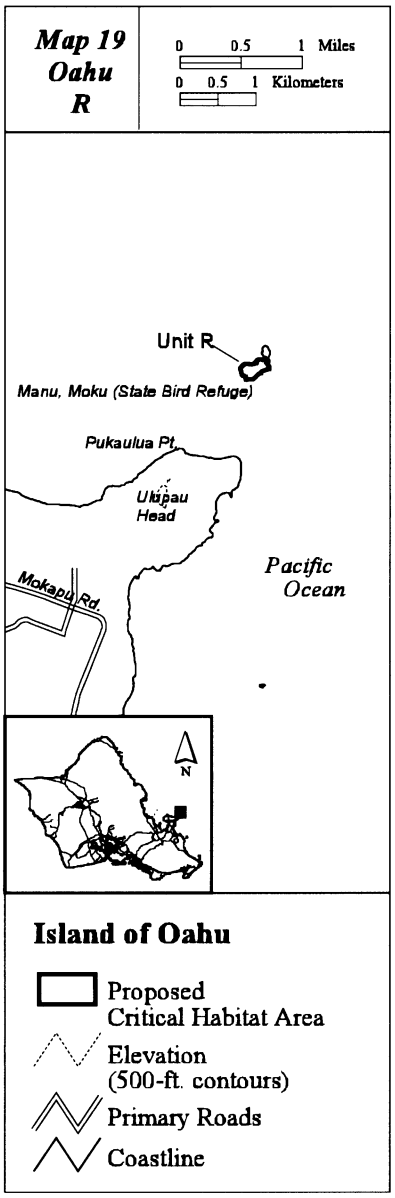
(*ii*) **Note:** Map 18 follows:



(*19*) Oahu R (6 ha, 15 ac).

(*i*) Unit consists of the entire offshore island located at approximately: 632595, 2374679.

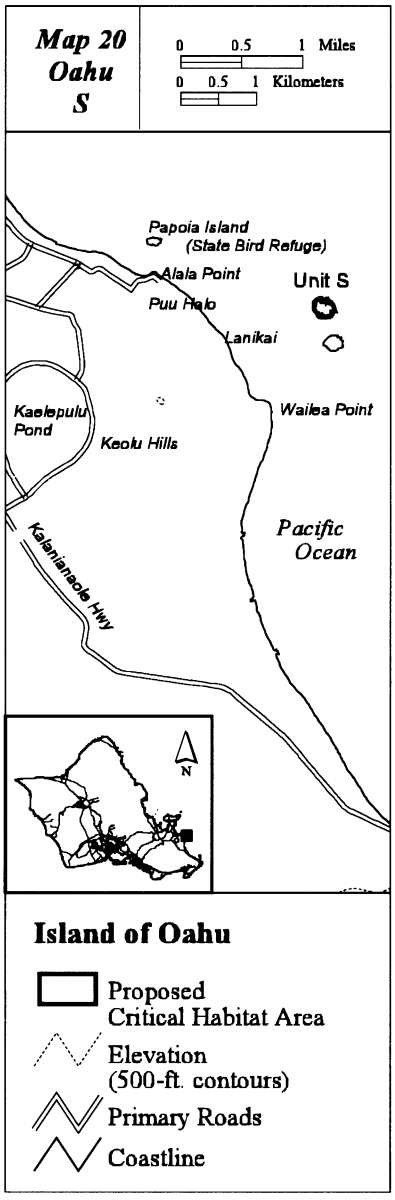
(*ii*) **Note:** Map 19 follows:



(*20*) Oahu S (4 ha, 12 ac).

(*i*) Unit consists of the entire offshore island located at approximately: 634867, 2366056.

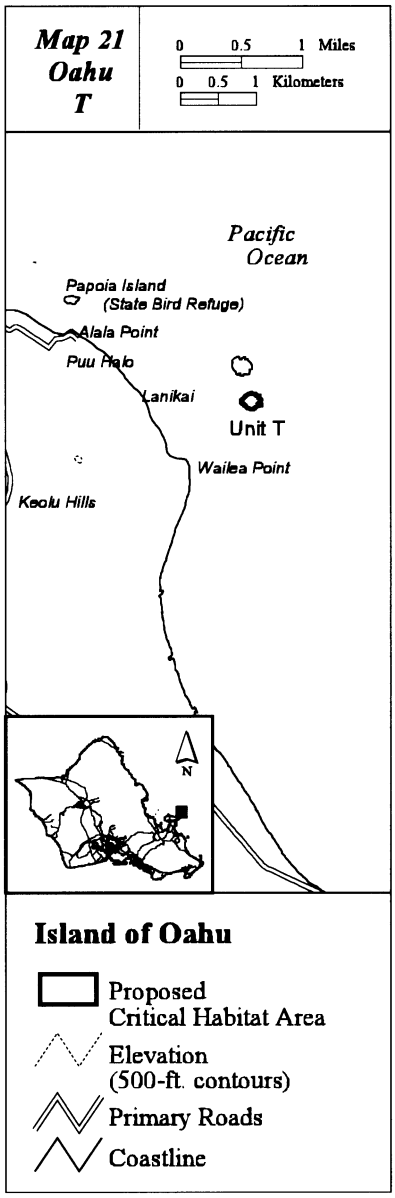
(*ii*) **Note:** Map 20 follows:



(*21*) Oahu T (4 ha, 9 ac).

(*i*) Unit consists of the entire offshore island located at approximately: 634990, 2365593.

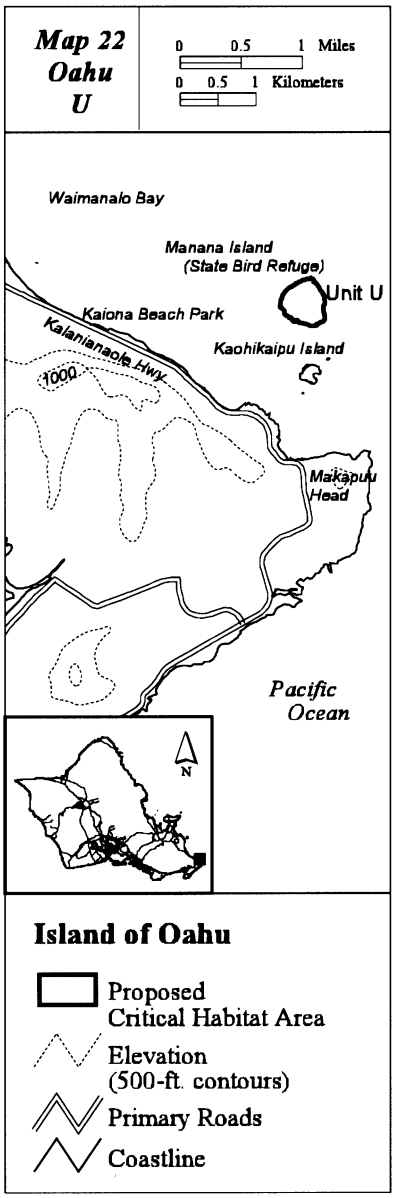
(*ii*) **Note:** Map 21 follows:



(*22*) Oahu U (27 ha, 67 ac).

(*i*) Unit consists of the entire offshore island located at approximately: 639277, 2359130.

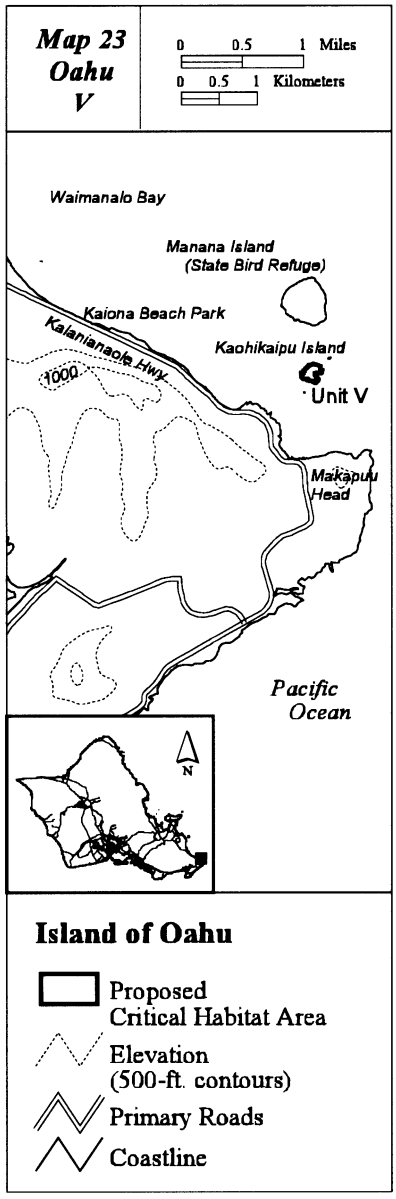
(*ii*) **Note:** Map 22 follows:



(*23*) Oahu V (4 ha, 10 ac).

(*i*) Unit consists of the entire offshore island located at approximately: 639339, 2358203

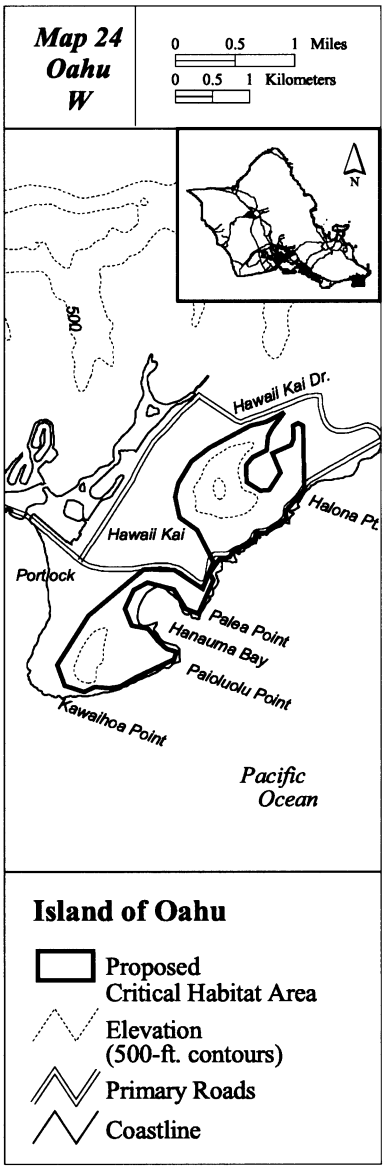
(*ii*) **Note:** Map 23 follows:



(*24*) Oahu W (340 ha, 840 ac).

(*i*) Unit consists of the following 60 boundary points: 637132, 2355245; 636973, 2355040; 636907, 2354928; 636897, 2354741; 636703, 2354644; 636613, 2354536; 636623, 2354312; 636808, 2354187; 636928, 2354201; 637076, 2354437; 636971, 2354701; 637225, 2354809; 637258, 2354895; 637251, 2355073; 637318, 2355106; 637384, 2355073; 637402, 2354195; 637140, 2353900; 637163, 2353807; 636874, 2353617; 636746, 2353610; 636729, 2353536; 636439, 2353369; 636391, 2353293; 636246, 2353257; 636122, 2353069; 636172, 2352980; 635971, 2352522; 635803, 2352590; 635641, 2352849; 635286, 2352948; 635095, 2352844; 634984, 2352593; 635070, 2352360; 635295, 2352316; 635417, 2352155; 635541, 2352050; 635672, 2352009; 635644, 2351902; 635123, 2351660; 634921, 2351541; 634779, 2351512; 634574, 2351531; 634430, 2351464; 634168, 2351550; 634069, 2351830; 634492, 2352496; 635235, 2353123; 635647, 2353114; 636026, 2352858; 636172, 2353227; 635954, 2353657; 635716, 2353823; 635656, 2354107; 635700, 2354295; 635875, 2354584; 636120, 2354776; 636669, 2355067; 636881, 2355121; 637132, 2355245.

(*ii*) **Note:** Map 24 follows:



(*25*) Oahu X1 (117 ha, 290 ac).

(*i*) Unit consists of the following 19 boundary points: 624293, 2352306; 624551, 2351916; 624594, 2351655; 624479, 2351301; 624279, 2351133; 623918, 2350950; 623734, 2350938; 623387, 2351012; 623164, 2351001; 623038, 2351128; 623080, 2351284; 622861, 2351384; 623109, 2351844; 623379, 2352152; 623614, 2352329; 623656, 2352268; 623889, 2352282; 623968, 2352380; 624293, 2352306.

(*ii*) Excluding the area consisting of the following 11 boundary points (59 ha; 145 ac): 623847, 2351144; 623734, 2351301; 623550, 2351461; 623616, 2351896; 623861, 2352075; 624048, 2352141; 624172, 2352080; 624321, 2351901; 624343, 2351375; 624109, 2351194; 623847, 2351144.

(*iii*) **Note:** See Map 25.

(*26*) Oahu X2 (8 ha, 21 ac).

(*i*) Unit consists of the following nine boundary points: 624111, 2351694; 624244, 2351705; 624294, 2351602; 624225, 2351495; 624162, 2351477; 624021, 2351312; 623901, 2351349; 623890, 2351454; 624111, 2351694.

(*ii*) **Note:** Map 25 follows:

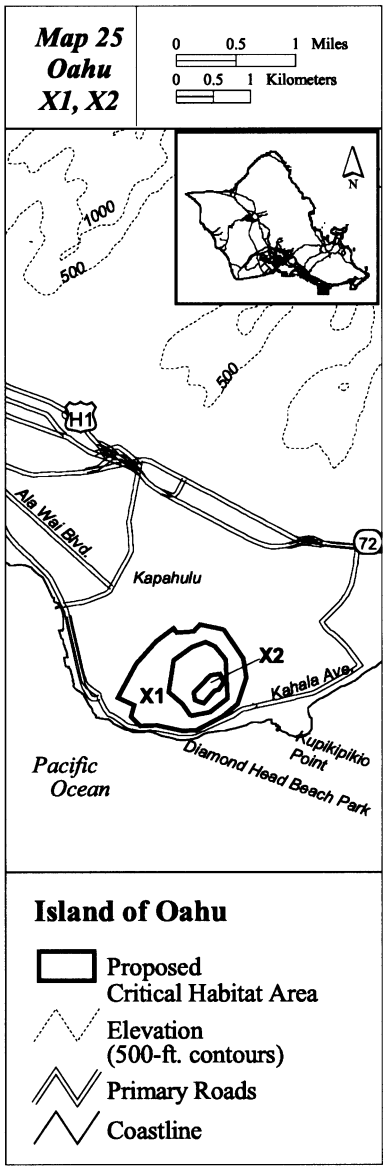


TABLE (A)(1)(I)(I).—PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR OAHU

Unit name	Species occupied	Species unoccupied
Oahu A	*Abutilon sandwicense, Alectryon macrococcus, Alsinidendron obovatum, Alsinidendron trinerve, Bonamia menziesii, Cenchrus agrimonioides, Centaurium sebaeoides, Chamaesyce celastroides* var. *kaenana, Chamaesyce herbstii, Colubrina oppositifolia, Ctenitis squamigera, Cyanea acuminata, Cyanea grimesiana* ssp. *obatae, Cyanea longiflora, Cyanea superba, Cyperus trachysanthos, Cyrtandra dentata, Delissea subcordata, Diellia falcata, Dubautia herbstobatae, Eragrostis fosbergii, Eugenia koolauensis, Euphorbia haeleeleana, Fluggea neowawraea, Gardenia mannii, Gouania meyenii, Gouania vitifolia, Hedyotis degeneri, Hedyotis parvula, Hesperomannia arborescens, Hesperomannia arbuscula, Hibiscus brackenridgei, Isodendrion laurifolium, Isodendrion longifolium, Labordia cyrtandrae, Lepidium arbuscula, Lipochaeta lobata* var. *leptophylla, Lipochaeta tenuifolia, Lobelia niihauensis, Melicope pallida, Neraudia angulata, Nototrichium humile, Peucedanum sandwicense, Phyllostegia hirsuta, Phyllostegia kaalaensis, Phyllostegia mollis, Plantago princeps, Sanicula mariversa, Schiedea hookeri, Schiedea kaalae, Schiedea kealiae, Schiedea nuttallii, Sesbania tomentosa, Silene lanceolata, Spermolepis hawaiiensis, Tetramolopium filiforme, Urera kaalae,* and *Viola chamissoniana* ssp. *chamissoniana*.	*Diplazium molokaiense, Isodendrion pyrifolium, Mariscus pennatiformis, Solanum sandwicense, Stenogyne kaneohoana, Tetramolopium lepidotum* ssp. *lepidotum* and *Vigna o-wahuense*.

TABLE (A)(1)(I)(I).—PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR OAHU—Continued

Unit name	Species occupied	Species unoccupied
Oahu B	*Bonamia menzeisii, Euphorbia haeleeleana,* and *Nototrichium humile*	*Gouania vitifolia, Hibiscus brackenridgei, Isodendrion pyrifolium,* and *Neraudia angulata.*
Oahu C	*Bonamia menzeisii*.	
Oahu D	*Bonamia menzeisii, Euphorbia haeleeleana, Neraudia angulata, Nototrichium humile,* and *Schiedea hookeri*.	*Chamesyce celastroides* var. *kaenana, Gouania vitifolia, Hibiscus brackenridgei,* and *Isodendrion pyrifolium.*
Oahu E	*Chamaesyce kuwaleana*.	
Oahu F	*Chamaesyce kuwaleana*	*Isodendrion pyrifolium.*
Oahu G	*Tetramolopium filiforme* and *Viola chamissoniana* ssp. *chamissoniana*.	
Oahu H	*Chamaesyce kuwaleana*.	
Oahu I	*Abutilon sandwicense, Alectryon macrococcus, Bonamia menzeisii, Cenchrus agrimonioides, Chamaesyce herbstii, Cyanea grimesiana* ssp. *obatae, Cyrtandra dentata, Delissea subcordata, Diellia falcata, Diellia unisora, Flueggea neowawraea, Gardenia mannii, Hedyotis parvula, Hesperomannia arbuscula, Lepidium arbuscula, Lipochaeta lobata* var. *leptophylla, Lobelia niihauensis, Melicope saint-johnii, Neraudia angulata, Phyllostegia hirsuta, Phyllostegia kaalaensis, Phyllostegia mollis, Phyllostegia parviflora, Plantago princeps, Sanicula mariversa, Schiedea hookeri, Schiedeakaalae, Schiedea nuttallii, Stenogyne kanehoana, Tetramolopium lepidotum* ssp. *lepidotum, Urera kaalae,* and *Viola chamissoniana* ssp. *chamissoniana*.	*Alsinidendron obovatum, Chamaesyce kuwaleana, Cyanea pinnatifida, Gouania meyenii, Hedyotis coriacea, Hibiscus brackenridgei, Isondendrion pyrifolium, Melicope pallida, Silene perlmanii,*and *Solanum sandwicense*
Oahu J	*Marsillea villosa*.	
Oahu K	*Marsillea villosa*.	
Oahu L	*Bonamia menzeisii, Chamaesyce deppeana, Chamaesyce rockii, Cyanea acuminata, Cyanea crispa, Cyanea grimesiana* ssp. *grimesiana, Cyanea humbotiana, Cyanea koolauensis, Cyanea st.-johnii, Cyanea truncata, Cyrtandra dentata, Cyrtandra polyantha, Cyrtandra subumbellata, Cyrtandra viridiflora, Diellia erecta, Eugenia koolauensis, Gardenia mannii, Hesperomannia arborescens, Isodendrion longifolium, Labordia cyrtandrae, Lobelia gaudichaudii* ssp. *koolauensis, Lobelia monostachya, Lysimachia filifolia, Melicope lydgatei, Myrsine juddii, Phlegmariurus nutans, Phyllostegia hirsuta, Phyllostegia parviflora, Plantago princeps, Pteris lydgatei, Sanicula purpurea, Schiedea kaalae, Tetraplasandra gymnocarpa, Trematalobelia singularis,* and *Viola oahuensiis*.	*Adenophorus periens, Chamaesyce celastroides* var. *kaenana, Cyanea longiflora, Cyanea superba, Delissea subcordata, Hedyotis coriacea, Isodendrion laurifolium, Lobelia oahuensis, Platanthera holochila,* and *Solanum sandwicense.*
Oahu M		*Centaurium sebaeoides* and *Sesbania tomentosa*
Oahu N		*Centaurium sebaeoides* and *Sesbania tomentosa.*
Oahu O	*Cyanea crispa, Cyanea truncata,* and *Schiedea kaalae*.	
Oahu P	*Bonamia menzeisii, Euphorbia haeleeleana,* and *Nototrichium humile*	*Gouania vitifolia, Hibiscus brackenridgei,* and *Isodendrion pyrifolium*
Oahu Q		*Sesbania tomentosa.*
Oahu R		*Chamaesyce kuwaleana* and *Sesbania tomentosa.*
Oahu S		*Sesbania tomentosa* and *Vigna o-wahuense.*
Oahu T		*Sesbania tomentosa* and *Vigna o-wahuense.*
Oahu U		*Chamaesyce kuwaleana, Sesbania tomentosa,* and *Vigna o-wahuense.*
Oahu V		*Sesbania tomentosa.*
Oahu W	*Centaurium sebaeoides* and *Marsillea villosa*	*Cyperus trachysanthos.*
Oahu X1	*Spermolepis hawaiiensis*	*Gouania meyenii.*
Oahu X2	*Cyperus trachysanthos*	*Marsillea villosa.*

(ii) *Hawaiian plants—Constituent elements.*

(A) *Flowering plants.*

Family Amaranthaceae: Nototrichium humile (kului)

Oahu A, B, D, and P, identified in the legal descriptions in paragraph (a)(1)(i)(I), constitutes critical habitat for *Nototrichium humile* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Cliff faces, gulches, streambanks, or steep slopes in dry or mesic forests often dominated by *Sapindus oahuensis* or *Diospyros sandwicensis* containing one or more of the following associated native plant species—*Erythrina sandwicensis, Sicyos* sp., *Rauvolfia sandwicensis, Nestegis sandwicensis, Streblus pendulinus, Myoporum sandwicense, Metrosideros polymorpha, Antidesma pulvinatum, Pouteria sandwicensis, Charpentiera* sp., *Hibiscus* sp., *Alyxia oliviformis, Pisonia umbellifera, Lipochaeta tenuis, Stenogyne* sp., *Artemisia australis, Bidens Cervicata, Carex wahuensis, Elaeocarpus bifidus, Abutilon sandwicense, Peperomia* sp., *Dodonaea viscosa, Canavalia* sp., *Psydrax odorata, Syzygium sandwicensis, Reynoldsia*

sandwicensis, Pleomele sp., *Eugenia reinwartiana,* or *Myrsine lanaiensis;* and

(*2*) Elevations between 185 and 806 m (607 and 2,644 ft).

Family Apiacaeae: Peucedanum sandwicense (makou)

Oahu A, identified in the legal description in (a)(1)(i)(I), constitutes critical habitat for *Peucedanum sandwicense* on Oahu. Within this unit, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Cliffs, slopes, or ridges in *Metrosideros polymorpha* lowland mesic forest containing one or more of the following associated native plant species: *Dodonaea viscosa, Carex meyenii, Eragrostis* sp., *Santalum ellipticum, Reynoldsia sandwicensis, Osteomeles anthyllidifolia, Scaevola sericea, Senna gaudichaudii, Pittosporum halophilum, Sida fallax, Plumbago zeylanica, Artemisia australis, Portulaca lutea, Lepidium bidentatum* var. *o-waihiense, Schiedea globosa, Lipochaeta integrifolia, Peperomia remyi, Plechranthus parviflorus,* or *Dianella sandwicensis;* and

(*2*) Elevations between 395 and 977 m (1,296 and 3,205).

Family Apiaceae: Sanicula mariversa (NCN)

Oahu A and I, identified in the legal descriptions in (a)(1)(i)(I), constitutes critical habitat for *Sanicula mariversa* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Well-drained, dry slopes or rock faces in mesic shrublands or open grassy areas containing one or more of the following associated native plant species: *Carex meyenii, Eragrostis* sp., *Bidens torta, Metrosideros tremuloides, Doryopteris* sp., or *Metrosideros polymorpha;* and

(*2*) Elevations between 582 and 978 m (1,909 and 3,208 ft).

Family Apiaceae: Sanicula purpurea (NCN)

Oahu unit L, identified in the legal description in (a)(1)(i)(I), constitutes critical habitat for *Sanicula purpurea* on Oahu. Within this unit, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Open *Metrosideros polymorpha* mixed montane bogs or windswept shrublands within the cloud zone containing one or more of the following associated native plant species: *Cheirodendron* sp., *Sadleria pallida, Bidens* sp., *Dicanthelium koolauensis, Styphelia tameiameiae, Gahnia beechyi, Plantago pachyphylla, Lycopodium* sp., *Vaccinium* sp., or *Machaerina angustifolia;* and

(*2*) Elevations between 415 and 959 m (1,361 and 3,146 ft).

Family Apiaceae: Spermolepis hawaiiensis (NCN)

Oahu A and X, identified in the legal descriptions in (a)(1)(i)(I), constitute critical habitat for *Spermolepis hawaiiensis* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Steep or vertical cliffs or the base of cliffs or ridges in coastal dry cliff vegetation containing one or more of the following associated native plant species: *Dodonaea viscosa, Artemisia australis, Bidens* sp., *Santalum ellipticum, Waltheria indica, Heteropogon contortus,* or *Doryopteris* sp.; and

(*2*) Elevations between 25 to 839 m (82 to 2,752 ft).

Family Araliaceae: Tetraplasandra gymnocarpa (oheohe)

Oahu unit L, identified in the legal description in (a)(1)(i)(I), constitutes critical habitat for *Tetraplasandra gymnocarpa* on Oahu. Within this unit, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Windswept summit ridges, slopes, or gullies in wet or sometimes mesic lowland forests or shrublands containing one or more of the following associated native plant species: *Cheirodendron* sp., *Antidesma platyphyllum, Syzygium sandwicensis, Hedyotis terminalis, Diplopterygium pinnatum, Melicope* spp., *Tetraplasandra oahuensis, Bobea elatior, Acacia koa, Cibotium chamissoi, Lobelia hypoleuca, Cyanea humboltiana, Myrsine fosbergii, Pouteria sandwicensis, Wikstroemia* sp., *Sadleria* sp., *Metrosideros polymorpha, Cheirodendron* sp., *Dicranopteris linearis, Machaerina angustifolia, Freycinetia arborea, Broussaisia arguta, Psychotria* spp., *Labordia* sp., *Hedyotis fosbergii, Bidens* sp., *Dubautia laxa,* or *Cibotium* sp.; and

(*2*) Elevations between 93 and 959 m (305 and 3,156 ft).

Family Asteraceae: Dubautia herbstobatae (naenae)

Oahu unit A, identified in the legal description in (a)(1)(i)(I), constitutes critical habitat for *Dubautia herbstobatae* on Oahu. Within this unit, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Rock outcrops, ridges, moderate slopes, or vertical cliffs in dry or mesic shrubland containing one or more of the following associated native plant species: *Dodonaea viscosa, Artemisia australis, Chamaesyce celastroides, Schiedea mannii, Carex meyenii, Bidens torta, Metrosideros polymorpha, Lysimachia waianaensis,* or *Eragrostis variabilis*; and

(*2*) Elevations between 266 and 978 m (872 and 3,208 ft).

Family Asteraceae: Hesperomannia arborescens (NCN)

Oahu A and L, identified in the legal descriptions in (a)(1)(i)(I), constitute critical habitat for *Hesperomannia arborescens* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Steep slopes, ridge tops, or gulches in lowland wet forests or shrublands containing one or more of the following associated native plant species: *Scaevola glabra, Broussaisia arguta, Melicope* sp., *Acacia koa, Machaerina angustifolia, Hedyotis terminalis, Tetraplasandra oahuensis, Scaevola gaudichaudiana, Dubautia* sp., *Labordia sessilis, Cibotium* sp., *Perotettia sandwicensis, Pipturus* sp., *Wikstroemia* sp., *Cheirodendron* sp., *Coprosma* sp., *Myrsine* sp., *Bobea elatior, Hibiscus arnottianus, Metrosideros polymorpha, Nestegis sandwicensis, Dicranopteris linearis, Antidesma platyphyllum, Psychotria mariniana, Syzygium sandwicensis,* or common *Melicope* spp.; and

(*2*) Elevations between 110 and 1,147 m (361 and 3,762 ft).

Family Asteraceae: Hesperomannia arbuscula (NCN)

Oahu A and I, identified in the legal descriptions in (a)(1)(i)(I), constitute critical habitat for *Hesperomannia arbuscula* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Slopes or ridges in dry to wet forest dominated by *Acacia koa* or *Metrosideros polymorpha* containing one or more of the following associated native plant species: *Syzygium sandwicensis, Freycinetia arborea, Cyanea longiflora, Antidesma* sp., *Bobea elatior, Hibiscus* sp., *Diospyros hillebrandii, Hedyotis terminalis, Bidens* sp., *Alyxia oliviformis, or Psychotria* sp.; and

(*2*) Elevations between 370 and 1,053 m (1,214 and 3,454 ft).

Family Asteraceae: Lipochaeta lobata var. *leptophylla (nehe)*

Oahu A and I, identified in the legal descriptions in (a)(1)(i)(I), constitute critical habitat for *Lipochaeta lobata* var. *leptophylla* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Cliffs, ridges, or slopes in dry or mesic shrubland containing one or more of the following associated native plant species: *Diospyros* sp., *Eragrostis* sp., *Artemisia australis, Lipochaeta tenuis, Stenogyne* sp., *Carex meyenii, Dodonaea viscosa, Peperomia* sp., *Psydrax odorata,* or *Bidens* sp.; and

(*2*) Elevations between 256 and 978 m (840 and 3,208 ft).

Family Asteraceae: Lipochaeta tenuifolia (nehe)

Oahu unit A, identified in the legal description in (a)(1)(i)(I), constitutes critical habitat for *Lipochaeta tenuifolia* on Oahu. Within this unit, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Ridgetops or bluffs in open areas or protected pockets of dry to mesic forests or shrublands or forests dominated by *Diospyros sandwicensis* containing one or more of the following associated native plant species: *Diospyros* sp., *Dodonaea viscosa, Eragrostis* sp., *Artemisia australis, Schiedea* sp., *Carex meyenii, Rumex* sp., *Dubautia* sp., *Bryophyllum* sp., *Osteomeles anthyllidifolia, Reynoldsia sandwicensis, Psydrax odorata, Doryopteris* sp., *Santalum* sp., *Myoporum sandwicense, Sapindus oahuensis,* or *Bidens* sp.; and

(*2*) Elevations between 67 and 978 m (220 and 3,208 ft).

Family Asteraceae: Tetramolopium filiforme (NCN)

Oahu A and G, identified in the legal descriptions in (a)(1)(i)(I), constitute critical habitat for *Tetramolopium filiforme* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(1) Dry cliff faces or ridges in dry or mesic forests containing one or more of the following associated native plant species: *Bidens torta, Carex meyenii, Peperomia tetraphylla, Schiedea* sp., *Sida fallax, Dodonaea viscosa, Artemisia australis,* or *Schiedea mannii;* and

(*2*) Elevations between 247 and 978 m (810 and 3,208 ft).

Family Asteraceae: Tetramolopium lepidotum ssp. *lepidotum (NCN)*

Oahu A and I, identified in the legal descriptions in (a)(1)(i)(I), constitute critical habitat for *Tetramolopium lepidotum* ssp. *lepidotum* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Grassy ridgetops, slopes, or cliffs in windblown dry forests and containing one or more of the following associated native plant species: *Eragrostis* sp., *Carex wahuensis, Bidens* sp., or *Metrosideros polymorpha;* and

(*2*) Elevations between 330 to 1,157 m (1,082 to 3,795 ft).

Family Brassicaceae: Lepidium arbuscula (anaunau)

Oahu A and I, identified in the legal descriptions in (a)(1)(i)(I), constitute critical habitat for *Lepidium arbuscula* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Exposed ridge tops and cliff faces in mesic and dry vegetation communities and containing one or more of the following associated native plant species: *Metrosideros polymorpha, Peperomia* sp., *Dryopteris unidentata, Sida fallax, Schiedea ligustrina, Artemisia australis, Rumex albescens, Styphelia tameiameiae, Psydrax odorata, Carex wahuensis, Chamaesyce multiformis, Lysimachia hillebrandii, Dubautia sp., Sophora chrysophylla, Dodonaea viscosa, Eragrostis* sp., *Bidens* sp., or *Carex meyenii;* and

(*2*) Elevations between 131 and 978 m (430 and 3,208 ft).

Family Campanulaceae: Cyanea acuminata (haha)

Oahu A and L, identified in the legal descriptions in (a)(1)(i)(I), constitute critical habitat for *Cyanea acuminata* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(1) Slopes, ridges, or stream banks in *Metrosideros polymorpha-Dicranopteris linearis, Acacia koa-Metrosideros polymorpha* wet or mesic forest or shrubland, or *Diospyros sandwicensis-Metrosideros polymorpha* lowland mesic forest containing one or more of the following associated native plant species: *Hibiscus* sp., *Charpentiera* sp., *Cyrtandra* spp., *Antidesma* sp., *Freycinetia arborea, Athyrium sandwichianum, Psychotria* sp., *Hedyotis* sp., *Perrottetia sandwicensis, Melicope* spp., *Thelypteris sandwicensis, Hedyotis centranthoides, Broussaisia argutus, Pipturus albidus, Labordia* sp., *Chamaesyce* sp., *Pisonia* sp., *Touchardia latifloia, Machaerina* sp., *Sadleria* sp., *Wikstroemia* sp., *Dubautia laxa, Ilex anomala, Syzygium sandwicensis,* and *Phyllostegia* sp.; and

(*2*) Elevations between 216 and 1,208 m (708 and 3,962 ft).

Family Campanulaceae: Cyanea crispa (haha)

Oahu L and O, identified in the legal descriptions in (a)(1)(i)(I), constitute critical habitat for *Cyanea crispa* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Slopes, moist gullies, or streambanks in open mesic forests or closed wet forests containing one or more of the following associated native plant species: *Diospyros* sp., *Pipturus albidus, Cibotium chamissoi, Perrottetia sandwicensis, Metrosideros polymorpha, Boehmeria grandis, Broussaisia argutus, Dubautia* sp., *Psychotria* sp., *Thelypteris cyatheoides, Antidesma platyphyllum, Microsorum spectrum, Cyrtandra* spp., *Pisonia umbellifera,* or *Touchardia latifolia;* and

(*2*) Elevations between 56 and 959 m (184 and 3,146 ft).

Family Campanulaceae: Cyanea grimesiana ssp. *grimesiana (haha)*

Oahu unit L, identified in the legal description in (a)(1)(i)(I), constitutes critical habitat for *Cyanea grimesiana* ssp. *grimesiana* on Oahu. Within this unit, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Rocky or steep slopes of stream banks in mesic forest often dominated by *Metrosideros polymorpha* or *Metrosideros polymorpha* and *Acacia koa,* and containing one or more of the following associated native plant species: *Cyanea angustifolia, Joinvillea* sp., *Clermontia persicaefolia, Melicope* sp., *Dicranopteris linearis, Coprosma* sp., *Alyxia oliviformis, Syzygium sandwicensis, Diplazium sandwichianum, Antidesma* sp., *Bobea* sp., *Myrsine* sp., *Nestegis sandwicensis, Psychotria* sp., or *Xylosma* sp.; and

(*2*) Elevations between 114 and 746 m (374 and 2,447 ft).

Family Campanulaceae: Cyanea grimesiana ssp. *obatae (haha)*

Oahu A and I, identified in the legal descriptions in (a)(1)(i)(I), constitute critical habitat for *Cyanea grimesiana* ssp. *obatae* on Oahu. Within these units, currently known primary constituent

elements of critical habitat are the habitat components provided by:

(*1*) Steep, moist, shaded slopes in diverse mesic to wet lowland forests containing one or more of the following associated native plant species: *Pouteria sandwicensis, Psychotria hathewayi, Streblus pendulinus, Perrottetia sandwicensis, Dubautia* sp., *Rumex* sp., *Chamaesyce* sp., *Coprosma* sp., *Nothocestrum* sp., *Dryopteris unidentata, Freycinetia arborea, Cibotium chamissoi, Myrsine lessertiana, Hedyotis terminalis, Hedyotis acuminata, Selaginella arbuscula, Charpentiera obovata, Cyrtandra waianaeensis, Pipturus albidus, Claoxylon sandwicense, Pisonia umbellifera, Acacia koa, Antidesma platyphyllum, Metrosideros polymorpha, Diplazium sandwichianum, and Cyanea membranacea;* and

(*2*) Elevations between 404 and 1,092 m (1,325 and 3,528 ft).

Family Campanulaceae: Cyanea humboltiana (haha)

Oahu unit L, identified in the legal description in (a)(1)(i)(I), constitutes critical habitat for *Cyanea humboltiana* on Oahu. Within this unit, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Wet *Metrosideros polymorpha-Dicranopteris linnearis* lowland shrubland containing one or more of the following associated native plant species: ferns, *Hedyotis terminalis, Dubautia laxa, Cibotium chamissoi, Syzygium sandwicensis, Acacia koa, Psychotria mariniana, Bobea elatior, Sadleria* sp., *Wikstroemia* sp., *Broussaisia argutus, Phyllostegia* sp., *Melicope* sp., *Machaerina angustifolia, Ilex anomala,* or *Scaevola mollis;* and

(*2*) Elevations between 261 and 959 m (856 and 3,146 ft).

Family Campanulaceae: Cyanea koolauensis (haha)

Oahu unit L, identified in the legal description in (a)(1)(i)(I), constitutes critical habitat for *Cyanea koolauensis* on Oahu. Within this unit, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Slopes, streambanks, and ridge crests in wet *Metrosideros polymorpha-Dicranopteris linearis* forest or shrubland containing one or more of the following associated native plant species: *Acacia koa, Bobea elatior, Syzygium sandwicensis, Pittosporum* sp. *Dubautia* sp., *Cibotium* sp., *Hedyotis* sp., *Wikstroemia* sp., *Bidens* sp., *Machaerina* sp., *Diploterygium pinnatum, Pritchardia martii, Sadleria* sp., *Broussaisia argutus, Melicope* sp., *Antidesma platyphyllum, Psychotria mariniana,* and *Scaevola* sp.; and

(*2*) Elevations between 163 and 959 m (535 and 3,146 ft).

Family Campanulaceae: Cyanea longiflora (haha)

Oahu A and L, identified in the legal descriptions in (a)(1)(i)(I), constitute critical habitat for *Cyanea longiflora* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Steep slopes, bases of cliffs, or ridge crests in mesic *Acacia koa-Metrosideros polymorpha* lowland forest containing one or more of the following associated native plant species: *Cibotium* sp., *Schiedea* sp., *Psychotria* sp., *Antidesma* sp., *Dicranopteris linearis, Coprosma* sp., or *Syzygium sandwicensis;* and

(*2*) Elevations between 221 and 1,191 m (725 and 3,906 ft).

Family Campanulaceae: Cyanea pinnatifida (haha)

Oahu unit I, identified in the legal description in (a)(1)(i)(I), constitutes critical habitat for *Cyanea pinnatifida* on Oahu. Within this unit, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Steep, wet, rocky slopes in diverse mesic forest containing one or more of the following associated native plant species: *Strongylodon ruber, Pisonia umbellifera, Pisonia sandwicensis, Psychotria sp., Canavalia sp., Pipturus albidus, Diplazium sandwichianum,* or native ferns; and

(*2*) Elevations between 450 and 881 m (1,476 and 2,890 ft).

Family Campanulaceae: Cyanea st.-johnii (haha)

Oahu unit L, identified in the legal description in (a)(1)(i)(I), constitutes critical habitat for *Cyanea st.-johnii* on Oahu. Within this unit, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Wet, windswept slopes and ridges in *Metrosideros polymorpha* mixed lowland shrubland or *Metrosideros polymorpha-Dicranopteris linearis* lowland shrubland containing one or more of the following associated native plant species *Psychotria* sp., *Alyxia oliviformis, Melicope* sp., *Broussaisia argutus, Cibotium* sp., *Labordia* sp., *Scaevola mollis, Dubautia laxa, Hedyotis* sp., *Antidesma* sp., *Sadleria pallida, Syzygium sandwicensis, Machaerina angustifolia, Bidens macrocarpa, Chamaesyce clusifolia, or Freycinetia arborea;* and

(*2*) Elevations between 415 and 959 m (1,361 and 3,146 ft).

Family Campanulaceae: Cyanea superba (haha)

Oahu A and L, identified in the legal descriptions in (a)(1)(i)(I), constitute critical habitat for *Cyanea superba* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Understory on sloping terrain on a well drained rocky substrate within mesic forest containing one or more of the following associated native plant species: *Diospyros* sp., *Metrosideros polymorpha, Xylosma* sp., *Nestegis sandwicensis, Psychotria* sp., *Hedyotis terminalis,* and *Pisonia brunoniana;* and

(*2*) Elevations between 354 and 872 m (1,161 and 2,860 ft).

Family Campanulaceae: Cyanea truncata (haha)

Oahu L and O, identified in the legal descriptions in (a)(1)(i)(I), constitute critical habitat for *Cyanea truncata* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Windward slopes and streambanks in mesic to wet forests containing one or more of the following associated native plant species: *Cyrtandra calpidicarpa, Cyrtandra laxiflora, Pipturus albidus, Cibotium chamissoi, Hibiscus arnottianus, Diospyros sandwicensis, Metrosideros polymorpha, Cyrtandra propinqua, Neraudia melastomifolia,* or *Pisonia umbellifera;* and

(*2*) Elevations between 54 and 705 m (177 and 2,312 ft).

Family Campanulaceae: Delissea subcordata (NCN)

Oahu A, I, and L, identified in the legal descriptions in (a)(1)(i)(I), constitute critical habitat for *Delissea subcordata* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Moderate to steep gulch slopes in mixed mesic forests containing one or more of the following associated native plant species: *Acacia koa, Alyxia oliviformis, Hedyotis acuminata, Streblus pendulinus, Diospyros sandwicensis, Psydrax odorata, Bobea* sp., *Myrsine lanaiensis, Claoxylon sandwicense, Charpentiera obovata, Chamaesyce multiformis, Pouteria sandwicensis, Antidesma* sp.,

Metrosideros polymorpha, Pisonia sp., *Diospyros hillebrandii, Nestegis sandwicensis,* or *Psychotria hathewayi;* and

(*2*) Elevations between 162 and 1025 m (531 and 3,362 ft).

Family Campanulaceae: Lobelia gaudichaudii ssp. koolauensis (NCN)

Oahu unit L, identified in the legal description in (a)(1)(i)(I), constitutes critical habitat for *Lobelia gaudichaudii* ssp. *koolauensis* on Oahu. Within this unit, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Moderate to steep slopes in *Metrosideros polymorpha* lowland wet shrublands or bogs containing one or more of the following associated native plant species: *Sadleria pallida, Isachne distichophylla, Vaccinium dentatum, Cibotium* sp., *Melicope* sp., *Bidens* sp., *Scaevola* sp., *Machaerina angustifolia, Dicanthelium koolauensis,* or *Broussaisia arguta;* and

(*2*) Elevations between 383 and 867 m (1,256 and 2,844 ft).

Family Campanulaceae: Lobelia monostachya (NCN)

Oahu unit L, identified in the legal description in (a)(1)(i)(I), constitutes critical habitat for *Lobelia monostachya* on Oahu. Within this unit, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Steep, sparsely vegetated cliffs in mesic shrubland containing one or more of the following associated native plant species: *Artemisia australis, Carex meyenii, Psilotum nudum,* or *Eragrostis* sp.; and

(*2*) Elevation between 44 and 614 m (144 to 2,014 ft).

Family Campanulaceae: Lobelia niihauensis (NCN)

Oahu A and I, identified in the legal descriptions in (a)(1)(i)(I), constitute critical habitat for *Lobelia niihauensis* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Exposed mesic or dry cliffs or ledges containing one or more of the following associated native plant species: *Osteomeles anthyllidifolia, Dodonaea viscosa, Schiedea mannii, Carex meyenii, Doryopteris* sp., *Sida fallax, Styphelia tameiameiae, Eragrostis* sp., *Bidens* sp., *Plectranthus parviflorus, Lipochaeta tenuis,* or *Artemisia* sp.; and

(*2*) Elevations between 339 to 926 m (1,112 to 3,037 ft).

Family Campanulaceae: Lobelia oahuensis (NCN)

Oahu unit L, identified in the legal description in (a)(1)(i)(I), constitutes critical habitat for *Lobelia oahuensis* on Oahu. Within this unit, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Steep slopes on summit cliffs in cloudswept wet forests or in lowland wet shrubland that are frequently exposed to heavy wind and rain containing one or more of the following associated native plant species: *Sadleria squarrosa, Peperomia* sp., *Broussaisia arguta, Scaevola* sp., *Vaccinium* sp., *Hedyotis* sp., *Cibotium* sp., *Freycinetia arborea, Lycopodium* sp., *Bidens* sp., *Wikstroemia* sp., *Phyllostegia* sp., *Syzygium sandwicensis, Melicope* sp., *Metrosideros polymorpha, Dicranopteris linearis, Machaerina angustifolia, Cheirodendron trigynum, Dubautia laxa,* or *Labordia hosakae;* and

(*2*) Elevations between 415 and 959 m (1,361 and 3,146 ft).

Family Campanulaceae: Trematalobelia singularis (NCN)

Oahu unit L, identified in the legal description in (a)(1)(i)(I), constitutes critical habitat for *Trematalobelia singularis* on Oahu. Within this unit, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Steep, windswept cliff faces or slopes in *Metrosideros polymorpha-Dicranopteris linearis* lowland wet shrubland containing one or more of the following associated native plant species: *Eugenia* sp., *Wikstroemia* sp., *Melicope* sp., *Sadleria* sp., *Cibotium* sp., *Broussaisia arguta,* or *Dubautia laxa;* and

(*2*) Elevations between 545 and 953 m (1,788 and 3,126 ft).

Family Caryophyllaceae: Alsinidendron obovatum (NCN)

Oahu A and I, identified in the legal descriptions in (a)(1)(i)(I), constitute critical habitat for *Alsinidendron obovatum* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Ridges and slopes in lowland diverse mesic forest dominated by *Acacia koa* and *Metrosideros polymorpha* containing one or more of the following associated native plant species: *Bidens torta, Antidesma platyphyllum, Cibotium chamissoi, Hedyotis terminalis, Cyanea longiflora, Pipturus* sp., *Machaerina* sp., *Peperomia* sp., *Perrottetia sandwicensis, Ilex anomala, Psydrax odorata, Coprosma* sp., or *Alyxia oliviformis;* and

(*2*) Elevations between 476 and 943 m (1,561 and 3,093 ft).

Family Caryophyllaceae: Alsinidendron trinerve (NCN)

Oahu unit A, identified in the legal description in (a)(1)(i)(I), constitutes critical habitat for *Alsinidendron trinerve* on Oahu. Within this unit, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Slopes in wet forest or the wetter portions of diverse mesic forest dominated by *Metrosideros polymorpha* or *Ilex anomala* and *Metrosideros polymorpha* montane wet forest containing one or more of the following associated native plant species: *Machaerina* sp., *Hedyotis* sp., *Peperomia* sp., *Perrottetia sandwcensis, Athyrium sandwichianum, Broussaisia arguta, Vaccinium* sp., *Phyllostegia* sp., *Coprosma ochracea, Gunnera* sp., *Nothoperanema rubiginosa,* or *Pipturus albidus;* and

(*2*) Elevations between 833 and 1,233 m (2,732 and 4,044 ft).

Family Caryophyllaceae: Schiedea hookeri (NCN)

Oahu A, D, and I, identified in the legal descriptions in (a)(1)(i)(I), constitute critical habitat for *Schiedea hookeri* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Slopes, cliffs or cliff bases, rock walls, or ledges in diverse mesic or dry lowland forest often with *Metrosideros polymorpha, Diospyros sandwicensis,* or *Diospyros hillebrandii* dominant, containing one or more of the following associated native plant species: *Carex wahuensis, Psydrax odoratum, Acacia koa, Bidens torta, Alyxia oliviformis, Pouteria sandwicensis, Hibiscus* sp., *Charpentiera tomentosa, Styphelia tameiameiae, Sida fallax, Pisonia sandwicensis, Lipochaeta tenuis, Stenogyne* sp., *Antidesma pulvinatum, Elaeocarpus bifidus, Dodonaea viscosa, Artemisia australis, Carex meyenii*, or *Eragrostis grandis;* and

(*2*) Elevations between 208 and 978 m (682 and 3,208 ft).

Family Caryophyllaceae: Schiedea kaalae (NCN)

Oahu A, I, L, and O, identified in the legal descriptions in (a)(1)(i)(I), constitute critical habitat for *Schiedea kaalae* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Steep slopes, cliffs, streambanks, or deep shade in diverse mesic or wet forests containing one or more of the following associated native plant species: *Pisonia sandwicensis, Psychotria hathewayi, Pouteria sandwicensis, Freycinetia arborea, Pipturus albidus, Cyrtandra laxiflora, Hedyotis acuminata, Selaginella arbuscula, Cyrtandra calpidicarpa, Boehmeria grandis, Claoxylon sandwicense, Diospyros hillebrandii, Dryopteris unidentata, Alyxia oliviformis, Charpentiera* sp., *Athyrium sandwichianum, Xylosma hawaiiense, Nothocestrum longifolium, Athyrium arnottii*, or *Pisonia umbellifera;* and

(*2*) Elevations between 64 and 869 m (210 and 2,850 ft).

Family Caryophyllaceae: Schiedea kealiae (NCN)

Oahu unit A, identified in the legal description in (a)(1)(i)(I), constitutes critical habitat for *Schiedea kealiae* on Oahu. Within this unit, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Steep slopes or cliff faces or bases in dry remnant *Erythrina sandwicensis* forest containing one or more of the following associated native plant species: *Sicyos* sp., *Plumbago zeylanica, Lepidium bidentatum, Lipochaeta remyi, Myoporum sandwicense, Hibiscus arnottianus, Psydrax odorata, Bidens* sp., or *Sida fallax;* and

(*2*) Elevations between 64 and 869 m (210 and 2,850 ft.)

Family Caryophyllaceae: Schiedea nuttallii (NCN)

Oahu A and I, identified in the legal description in (a)(1)(i)(I), constitutes critical habitat for *Schiedea nuttallii* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Rock walls, forested slopes, or steep walls in *Acacia koa-Metrosideros polymorpha* lowland mesic forest or *Metrosideros polymorpha-Dodonaea viscosa* forest containing one or more of the following associated native plant species: *Alyxia oliviformis, Bidens torta, Psydrax odorata, Cyanea longiflora, Cibotium chamissoi, Hedyotis terminalis, Perrottetia sandwicensis, Ilex anomala, Coprosma* sp., *Peperomia* sp., *Machaerina* sp., *Pipturis* sp., or *Antidesma platyphyllum;* and

(*2*) Elevations between 436 and 1185 m (1,430 and 3,887 ft).

Family Caryophyllaceae: Silene lanceolata (NCN)

Oahu unit A, identified in the legal description in (a)(1)(i)(I), constitutes critical habitat for *Silene lanceolata* on Oahu. Within this unit, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Cliff faces or ledges of gullies in dry to mesic shrubland or cliff communities containing one or more of the following associated native plant species: *Artemisia aurstralis, Dodonaea viscosa, Schiedea mannii, Tetramolopium fifilforme, Bidens* sp., *Carex* sp., *Osteomeles anthyllidifolia, Chamaesyce* sp., or *Lysimachia* sp.; and

(*2*) Elevations between 351 to 978 m (1,151 to 3,208 ft).

Family Caryophyllaceae: Silene perlmanii (NCN)

Oahu unit I, identified in the legal description in (a)(1)(i)(I), constitutes critical habitat for *Silene perlmanii* on Oahu. Within this unit, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Steep rocky slopes in *Acacia koa-Metrosideros polymorpha* lowland mesic forest; and

(*2*) Elevations between 493 and 919 m (1,617 and 3,014 ft).

Family Convolvulaceae: Bonamia menziesii (NCN)

Oahu A, B, C, D, I, L, and P, identified in the legal descriptions in (a)(1)(i)(I), constitute critical habitat for *Bonamia menziesii* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Steep slopes or level ground in dry or mesic forest in open or closed canopy containing one or more of the following associated native plant species: *Alyxia oliviformis, Pleomele* sp., *Sida fallax, Waltheria indica, Erythrina sandwicensis, Rauvolfia sandwicensis, Sicyos* sp., *Acacia koa, Styphelia tameiameiae, Dodonaea viscosa, Metrosideros polymorpha, Psydrax odorata, Dianella sandwicensis, Diospyros sandwicensis, Hedyotis terminalis, Melicope anisata, Melicope barbigera, Myoporum sandwicensis, Nestegis sandwicense, Pisonia* sp., *Pittosporum* sp., *Pouteria sandwicensis,* or *Sapindus oahuensis;* and

(*2*) Elevations between 31 and 809 m (102 and 2,654 ft).

Family Cyperaceae: Cyperus trachysanthos (puukaa)

Oahu A, W, and X, identified in the legal descriptions in (a)(1)(i)(I), constitute critical habitat for *Cyperus trachysanthos* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Mud flats, wet clay soil, seasonal ponds, or wet cliff seeps on coastal cliffs or talus slopes containing *Hibiscus tiliaceus;* and

(*2*) Elevations above 248 m (813 ft).

Family Cyperaceae: Mariscus pennatiformis (NCN)

Oahu unit A, identified in the legal description in (a)(1)(i)(I), constitutes critical habitat for *Mariscus pennatiformis* on Oahu. Within this unit, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Mesic and wet *Metrosideros polymorpha* forest and *Metrosideros polymorpha-Acacia koa* forest; and

(*2*) Elevations between 424 and 1,032 m (1,391 and 3,385 ft).

Family Euphorbiaceae: Chamaesyce celastroides var. *kaenana (akoko)*

Oahu A, D, and L, identified in the legal descriptions in (a)(1)(i)(I), constitute critical habitat for *Chamaesyce celastroides* var. *kaenana* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Windward talus slopes, leeward rocky cliffs, open grassy slopes, or on vegetated cliff faces in coastal dry shrubland containing one or more of the following associated native plant species: *Lipochaeta lobata, Myoporum sandwicense, Heteropogon contortus, Santalum* sp., *Plumbago zeylanica, Psydrax odorata, Boerhavia* sp., *Waltheria indica, Dodonaea viscosa, Artemisia australis, Psilotum nudum, Chamaesyce celastroides* var. *amplectans, Gossypium tomentosum, Jacquemontia ovalifolia* ssp. *sandwicensis, Santalum freycinetianum,* or *Sida fallax;* and

(*2*) Elevations between sea level and 862 m (0 and 2,827 ft).

Family Euphorbiaceae: Chamaesyce deppeana (akoko)

Oahu unit L, identified in the legal description in (a)(1)(i)(I), constitutes critical habitat for *Chamaesyce deppeana* on Oahu. Within this unit, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Windward facing ridge crests, cliff faces and mixed native cliffs containing one or more of the following associated native plant species: *Metrosideros polymorpha* or *Bidens sandvicensis;* and

(*2*) Elevations from 274 to 661 m (899 to 2,168 ft).

Family Euphorbiaceae: Chamaesyce herbstii (akoko)

Oahu A and I, identified in the legal descriptions in (a)(1)(i)(I), constitutes critical habitat for *Chamaesyce herbstii* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Shaded gulch bottoms and slopes in mesic *Acacia koa-Metrosideros polymorpha* lowland forests or diverse mesic forests containing one or more of the following associated native plant species: *Xylosma* sp., *Pteralyxia* sp., *Morinda trimera, Hedyotis* sp., *Coprosma* sp., *Pipturis albidus, Diplazium sandwichianum, Antidesma platyphyllum, Hibiscus arnottianus* var. *arnottianus, Melicope* sp., *Pouteria sandwicensis,* or *Urera glabra;* and

(*2*) Elevations between 435 and 886 m (1,427 and 2,906 ft).

Family Euphorbiaceae: Chamaesyce kuwaleana (akoko)

Oahu E, F, H, I, R, and U, identified in the legal descriptions in (a)(1)(i)(I), constitute critical habitat for *Chamaesyce kuwaleana* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Thin guano soil on basaltic rock, arid, exposed volcanic cliffs, dry or mesic rocky ridges, or sparsely vegetated slopes containing one or more of the following associated native plant species: *Heteropogon contortus, Bidens* sp., *Artemisia* sp., *Plectranthus parvilforus, Chamaesyce* sp., *Schiedea* sp., *Carex* sp., *Sida fallax* or *Dodonaea viscosa;* and

(*2*) Elevations between 0 and 596 m (0 and 1,955 ft).

Family Euphorbiaceae: Chamaesyce rockii (akoko)

Oahu unit L, identified in the legal description in (a)(1)(i)(I), constitutes critical habitat for *Chamaesyce rockii* on Oahu. Within this unit, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Gulch slopes, gulch bottoms, and ridge crests in wet *Metrosideros polymorpha-Dicranopteris linearis* forest and shrubland containing one or more of the following associated native plant species: *Bidens* sp., *Antidesma platyphyllum, Hedyotis terminalis, Psychotria* spp., *Melicope* spp., *Coprosma longifolia, Diplopterygium pinnatum, Cibotium* sp., *Broussaisia arguta, Dubautia laxa, Machaerina* sp., *Psychotria fauriei, Wikstroemia* sp., or *Myrsine juddii;* and

(*2*) Elevations between 208 and 871 m (682 and 2,857 ft).

Family Euphorbiaceae: Euphorbia haeleeleana (akoko)

Oahu A, B, D, and P, identified in the legal descriptions in (a)(1)(i)(I), constitute critical habitat for *Euphorbia haeleeleana* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Dry forest dominated by *Diospyros* sp. containing one or more of the following associated native plant species: *Psydrax odorata, Dodonaea viscosa, Erythrina sandwicensis, Pleomele* sp., *Reynoldsia sandwicensis,* or *Sapindus oahuensis;* and

(*2*) Elevations between 156 and 586 m (512 and 1,922 ft).

Family Euphorbiaceae: Flueggea neowawraea (mehamehame)

Oahu A and I, identified in the legal descriptions in (a)(1)(i)(I), constitute critical habitat for *Flueggea neowawraea* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Gulch slopes, ridge crests, or near streams in dry or mesic forest containing one or more of the following associated native plant species: *Pisonia sandwicensis, Hibiscus arnottianus, Morinda sandwicensis, Hedyotis terminalis, Alyxia oliviformis, Chamaesyce multiformis, Metrosideros polymorpha, Myrsine* sp., *Pleomele* sp., *Myoporum sandwicense, Chamaesyce herbstii, Pteralyxia* sp., *Pipturis albidus, Diospyros hillebrandii, Pisonia umbellifera, Charpentiera* sp., *Claoxylon sandwicensis, Antidesma platyphyllum, Sapindus oahuensis, Pittosporum* sp., *Erythrina sandwicensis, Diospyros sandwicensis, Antidesma pulvinatum, Bobea* sp., *Psydrax odorata, Nestegis sandwicensis, Rauvolfia sandwicensis,* or *Streblus pendulina;* and

(*2*) Elevations between 323 to 1,006 m (1,059 to 3,300 ft).

Family Fabaceae: Sesbania tomentosa (ohai)

Oahu A, M, N, Q, R, S, T, U, and V, identified in the legal descriptions in (a)(1)(i)(I), constitute critical habitat for *Sesbania tomentosa* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Cliff faces, broken basalt, or sand dunes with rock outcrops in *Scaevola sericea* coastal dry shrubland or *Sporobolus virginicus* mixed grasslands containing one or more of the following associated native plant species: *Heliotropium* sp., *Jacquemontia sandwicensis, Myoporum sandwicense, Sida fallax,* or *Lipochaeta* sp.; and

(*2*) Elevations between sea level and 152 m (0 and 499 ft).

Family Fabaceae: Vigna o-wahuensis (NCN)

Oahu S, T, and U, identified in the legal descriptions in (a)(1)(i)(I), constitute critical habitat for *Vigna o-wahuensis* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Open dry fossil reef, with shrubs or grasses for the plant to climb over or fairly steep slopes; and

(*2*) Elevations between 0 and 609 m (0 and 1,998 ft).

Family Gentianaceae: Centaurium sebaeoides (awiwi)

Oahu A, M, N, and W, identified in the legal descriptions in (a)(1)(i)(I), constitute critical habitat for *Centaurium sebaeoides* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Volcanic or clay soils or cliffs in arid coastal areas or on coral plains containing one or more of the following associated native plant species: *Artemisia* sp., *Bidens* sp., *Jacquemontia ovalifolia, Lipochaeta succulenta,* or *Lysimachia* sp.; and

(*2*) Below 368 m (1,207 ft).

Family Gesneriaceae: Cyrtandra dentata (haiwale)

Oahu A, I, and L, identified in the legal descriptions in (a)(1)(i)(I), constitute critical habitat for *Cyrtandra dentata* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Gulches, slopes, streambanks, or ravines in mesic or wet forest containing one or more of the following associated native plant species: *Urera glabra, Acacia koa, Pisonia sandwicensis, Pipturis albidus, Metrosideros polymorpha, Pouteria sandwicensis, Pisonia umbellifera,* or *Syzygium sandwicensis;* and

(*2*) Elevations between 255 and 953 m (836 and 3,126 ft).

Family Gesneriaceae: Cyrtandra polyantha (haiwale)

Oahu unit L, identified in the legal description in (a)(1)(i)(I), constitutes

critical habitat for *Cyrtandra polyantha* on Oahu. Within this unit, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Ridges of valleys in *Metrosideros polymorpha* mesic or wet forests containing one or more of the following associated native plant species: *Machaerina angustifolia, Dicranopteris linearis, Broussaisia arguta, Coprosma foliosa,* or *Psychotria* sp.; and

(*2*) Elevations between 331 and 762 m (1,086 and 2,499 ft).

Family Gesneriaceae: Cyrtandra subumbellata (haiwale)

Oahu unit L, identified in the legal description in (a)(1)(i)(I), constitutes critical habitat for *Cyrtandra subumbellata* on Oahu. Within this unit, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Moist slopes or gulch bottoms in wet forest dominated by *Metrosideros polymorpha* or a mixture of *Metrosideros polymorpha-Dicranopteris linearis-Acacia koa* containing one or more of the following associated native plant species: *Machaerina* sp., *Boehmeria grandis, Broussaisia arguta,* or *Thelypteris* sp.; and

(*2*) Elevations between 345 and 790 m (1,132 and 2,591 ft).

Family Gesneriaceae: Cyrtandra viridiflora (haiwale)

Oahu unit L, identified in the legal description in (a)(1)(i)(I), constitutes critical habitat for *Cyrtandra viridiflora* on Oahu. Within this unit, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Wind blown ridge tops in cloud covered wet forest or shrubland containing one or more of the following associated native plant species: *Diplopterygium pinnatum., Psychotria* sp., *Freycinetia arborea, Dubautia* sp., *Ilex anomala, Melicope* sp., *Hedyotis* sp., *Cheirodendron platyphyllum, Broussaisia arguta, Metrosideros polymorpha, Syzygium sandwicensis, Machaerina* sp., *Metrosideros rugosa,* or *Dicranopteris linearis;* and

(*2*) Elevations between 443 and 867 m (1,453 and 2,844 ft).

Family Loganiaceae: Labordia cyrtandrae (kamakahala)

Oahu A and L, identified in the legal descriptions in (a)(1)(i)(I), constitute critical habitat for *Labordia cyrtandrae* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Shady gulches, slopes, or glens in mesic to wet forests and shrublands dominated by *Metrosideros polymorpha, Diplopterygium pinnatum,* and/or *Acacia koa* containing one or more of the following associated native plant species: *Broussaisia argutus, Cyrtandra* sp., *Phyllostegia* sp., *Dicranopteris linearis, Antidesma* sp., *Bidens torta, Artemisia australis, Dubautia plantaginea, Rumex* sp., *Lysimachia hillebrandii, Chamaesyce* sp., *Coprosma* sp., *Boehmeria grandis, Peperomia membranaceae, Pouteria sandwicensis, Diplazium sandwichianum, Pipturus albidus, Perrottetia sandwicensis,* or *Psychotria* sp.; and

(*2*) Elevations between 212 and 1,233 m (695 and 4,044 ft).

Family Lamiaceae: Phyllostegia hirsuta (NCN)

Oahu A, I, and L, identified in the legal descriptions in (a)(1)(i)(I), constitute critical habitat for *Phyllostegia hirsuta* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Steep, shaded slopes, cliffs, ridges, gullies, or streambanks in mesic or wet forests dominated by *Metrosideros polymorpha* or a mixture of *Metrosideros polymorpha* and *Dicranopteris linearis* containing one or more of the following associated native plant species: *Pisonia* sp., *Diplazium sandwichiaum, Freycinetia arborea, Chamaesyce multiformis, Hibiscus* sp., *Rumex albescens, Machaerina angustifolia, Clermontia kekeana, Perotettia sandwicensis, Cibotium* sp., *Hedyotis schlectendahliana, Ilex anomala, Lysimachia hillebrandii, Melicope* sp., *Psychotria* sp., *Astelia* sp., *Antidesma platyphyllum, Dubautia laxa, Cyanea membranacea, Elaeocarpus bifidus, Myrsine sandwicensis, Scaevola gaudichaudiana, Pleomele* sp., *Dryopteris unidentata, Streblus pendulinus, Claoxylon sandwicense, Nothocestrum* sp., *Neraudia* sp., *Zanthoxylum kauaense, Labordia kaalae, Cyrtandra waianaeensis, Phyllostegia grandiflora, Liparis hawaiiensis, Dubautia sherffiana, Pouteria sandwicensis, Brousaissia arguta, Pipturis* sp., *Coprosma longifolia, Hedyotis terminalis, Myrsine lessertiana,* or native ferns; and

(*2*) Elevations between 195 and 1,202 m (640 and 3,943 ft).

Family Lamiaceae: Phyllostegia kaalaensis (NCN)

Oahu A and I, identified in the legal descriptions in (a)(1)(i)(I), constitute critical habitat for *Phyllostegia kaalaensis* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Gulch slopes or bottoms or almost vertical rock faces in mesic forest or *Sapindus oahuensis* forest containing one or more of the following associated native plant species: *Myrsine lanaiensis, Myrsine lessertiana, Psychotria hathewayi, Antidesma platyphyllum, Diplazium sandwichianum, Pipturus albidus, Hibiscus* sp., *Claoxylon sandwicense, Neraudia melastomifolia, Streblus pendulinus, Pouteria sandwicensis, Freycinetia arborea,* or *Urera glabra;* and

(*2*) Elevations between 374 and 796 m (1,227 and 2,611 ft).

Family Lamiaceae: Phyllostegia mollis (NCN)

Oahu A and I, identified in the legal descriptions in (a)(1)(i)(I), constitute critical habitat for *Phyllostegia mollis* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Steep slopes or gulches in diverse mesic to wet forests containing one or more of the following associated native plant species: *Pouteria sandwicensis, Antidesma platyphyllum, Dryopteris unidentata, Carex meyenii, Metrosideros polymorpha, Chamaesyce multiformis, Acacia koa, Claoxylon sandwicense, Alyxia oliviformis, Myrsine* sp., *Diospyros hilebrandii, Psychotria hathewayi, Pipturus alba, Urera glabra,* or *Pisonia umbellifera;* and

(*2*) Elevations between 519 to 928 m (1,702 to 3,044 ft).

Family Lamiaceae: Phyllostegia parviflora (NCN)

Oahu unit I, identified in the legal description in (a)(1)(i)(I), constitutes critical habitat for *Phyllostegia parviflora* var. *lydgatei* on Oahu. Within this unit, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Moderate to steep slopes in mesic forest containing one or more of the following associated native plant species: *Xylosma hawaiiense, Claoxylon sandwicense, Antidesma platyphyllum, Pouteria sandwicensis, Pipturus albidus, Myrsine lessertiana, Chamaesyce multiformis, Coprosma foliosa, Dryopteris unidentata, Selaginella arbuscula,* or *Pipturus alba;* and

(*2*) Elevations between 555 to 881 m (1,820 to 2,890 ft).

Oahu unit L, identified in the legal description in (a)(1)(i)(I), constitutes

critical habitat for *Phyllostegia parviflora* var. *parviflora* on Oahu. Within this unit, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) *Metrosideros polymorpha* mixed lowland wet forest containing one or more of the following associated native plant species: *Cibotium* sp., *Dicranopteris linearis, Broussaisia arguta, Antidesma* sp., *Pritchardia* sp., *Tetraplasandra* sp., *Touchardia latifolia, Pipturus* sp., *Cheirodendron* sp., *Phyllostegia glabra, Cyrtandra* sp., *Syzygium sandwicensis,* or *Melicope* sp.; and

(*2*) Elevations between 232 and 867 m (761 and 2,844 ft).

Family Lamiaceae: Stenogyne kanehoana (NCN)

Oahu A and I, identified in the legal descriptions in (a)(1)(i)(I), constitute critical habitat for *Stenogyne kanehoana* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Lowland mesic forest containing one or more of the following associated native plant species: *Acacia koa, Metrosideros polymorpha, Psychotria* sp., *Freycinetia arborea, Bidens* sp., *Chamaesyce* sp., *Alyxia oliviformis, Cibotium* sp., or *Scaevola* sp.; and

(*2*) Elevations between 559 and 1,168 m (1,834 and 3,831 ft).

Family Malvaceae: Abutilon sandwicense (NCN)

Oahu A and I, identified in the legal descriptions in (a)(1)(i)(I), constitute critical habitat for *Abutilon sandwicense* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Steep slopes or gulches in dry to mesic lowland forest containing one or more of the following associated native plant species: *Sapindus oahuensis, Hibiscus arnottianus, Psydrax odorata, Diospyros sandwicensis, Reynoldsia sandwicensis, Nestegis sandwicensis, Antidesma pulvinatum, Pittosporum* sp., *Pleomele* sp., *Rauvolfia sandwicensis, Myrsine lanaiensis, Pisonia* sp., *Metrosideros polymorpha, Pipturus albidus, Eugenia reinwartiana,* or *Elaeocarpus bifidus;* and

(*2*) Elevations between 149 and 875 m (489 and 2,870 ft).

Family Malvaceae: Hibiscus brackenridgei (mao hau hele)

Oahu A, B, D, I, and P, identified in the legal descriptions in (a)(1)(i)(I), constitute critical habitat for *Hibiscus brackenridgei* ssp. *mokuleianus* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Slopes, cliffs, or arid ledges in lowland dry forest or shrubland containing one or more of the following associated native plant species: *Erythrina sandwicensis, Heteropogon contortus, Waltheria indica, Doryopteris* sp., *Lepidium bidentatum, Lipochaeta remyi, Bidens amplectans, Chamaesyce* sp., *Reynoldsia sandwicensis, Pleomele halapepe, Diospyros hillebrandii, Dodonaea viscosa., Psydrax odoratua or Sida fallax;* and

(*2*) Elevations between 24 to 490 m (79 to 1,607 ft).

Oahu A, identified in the legal description in (a)(1)(i)(I), constitutes critical habitat for *Hibiscus brackenridgei* ssp. *molokaiana* on Oahu. Within this unit, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Dry shrublands containing one or more of the following associated native plant species: *Waltheria indica, Sida fallax, Doryopteris* sp., *Dodonaea viscosa,* or *Heteropogon contortus;* and

(*2*) Elevations between 23 and 580 m (75 to 1,902 ft).

Family Myrsinaceae: Myrsine juddii (kolea)

Oahu L, identified in the legal description in (a)(1)(i)(I), constitutes critical habitat for *Myrsine juddii* on Oahu. Within this unit, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Ridge crests or gulch slopes in wet forests or shrublands dominated by *Metrosideros polymorpha* or a mixture of *Metrosideros polymorpha* and *Dicranopteris linearis* containing one or more of the following associated native plant species: *Machaerina* sp., *Cheirodendron trigynum, Melicope clusiifolia, Psychotria mariniana, Cheirodendron platyphyllum,* or *Syzygium sandwicensis;* and

(*2*) Elevations between 384 and 867 m (1,260 and 2,844 ft).

Family Myrtaceae: Eugenia koolauensis (nioi)

Oahu A and L, identified in the legal descriptions in (a)(1)(i)(I), constitute critical habitat for *Eugenia koolauensis* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Gentle to steep slopes or ridges in mesic or dry forests dominated by *Metrosideros polymorpha* or *Diospyros* sp. containing one or more of the following associated native plant species: *Bobea elatior, Rauvolfia sandwicensis, Alyxia oliviformis, Pouteria sandwicensis, Dicranopteris linearis, Styphelia tameiameiae, Carex meyenii, Myrsine lessertiana, Nestegis sandwicensis, Pleomele halapepe,* or *Psydrax odorata;* and

(*2*) Elevations between 57 to 437 m (187 to 1,433 ft).

Family Orchidaceae: Platanthera holochila (NCN)

Oahu L, identified in the legal description in (a)(1)(i)(I), constitutes critical habitat for *Platanthera holochila* on Oahu. Within this unit, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) *Metrosideros polymorpha-Dicranopteris linearis* montane wet forest or *Metrosideros polymorpha* mixed montane bogs containing one or more of the following associated native plant species: *Cibotium* sp., *Coprosma ernodeoides, Styphelia tameiameiae, Wikstroemia* sp., *Scaevola chamissoniana, Sadleria* sp., *Lythrum maritimum, Deschampsia nubigena, Luzula hawaiiensis, Sisyrinchium acre, Broussaisia arguta, Clermontia* sp., *Lycopodium cernuum, Dubautia scabra, Polypodium pellucidum, moreletia gahniiformis,* or *Vaccinium reticulatum;* and

(*2*) Elevations between 447 and 867 m (1,466 and 2,844 ft).

Family Plantaginaceae: Plantago princeps (laukahi kuahiwi)

Oahu L, identified in the legal description in (a)(1)(i)(I), constitutes critical habitat for *Plantago princeps* var. *longibracteata* on Oahu. Within this unit, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Sides of waterfalls or wet rock faces containing one or more of the following associated native plant species: *Lobelia gaudichaudii, Scaevola glabra, Bidens* sp., *Eugenia* sp., *Coprosina granadensis,* or *Metrosideros rugosa;* and

(*2*) Elevations around 64 and 835 m (210 and 2,844 ft).

Oahu A, I, and L, identified in the legal descriptions in (a)(1)(i)(I), constitute critical habitat for *Plantago princeps* var. *princeps* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Slopes or ledges in *Metrosideros polymorpha* lowland mesic forests or shrublands containing one or more of

the following associated native plant species: *Lysimachia* sp., *Chamaesyce* sp., *Eragrostis* sp., *Pilea peploides, Artemisia australis, Viola* sp., *Dubautia plantaginea,* or *Bidens sp.;* and

(*2*) Elevations between 110 and 1,064 m (361 and 3,490 ft).

Family Poaceae: Cenchrus agrimonioides (kamanomano)

Oahu A and I, identified in the legal descriptions in (a)(1)(i)(I), constitute critical habitat for *Cenchrus agrimonioides* var. *agrimonioides* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Dry ridges or upper slopes, or ridges in lowland mixed mesic forest containing one or more of the following associated native plant species: *Acacia koa, Metrosideros polymorpha, Alyxia oliviformis, Psydrax odorata, Diospyros sandwicensis, Carex wahuensis, Nestegis sandwicensis, Psychotria sp., Bobea sp., Chamaesyce multiformis, Gahnia beecheyi, Coprosma foliosa, Styphelia tameiameiae, or Eragrostis variabilis;* and

(*2*) Elevations between 357 and 890 m (1,171 and 2,919 ft).

Family Poaceae: Eragrostis fosbergii (NCN)

Oahu A, identified in the legal description in (a)(1)(i)(I), constitutes critical habitat for *Eragrostis fosbergii* on Oahu. Within this unit, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Ridge crests or moderate slopes in dry or mesic forests containing one or more of the following associated native plant species: *Chamaesyce* sp., *Alyxia oliviformis, Sphenomeris* sp., *Nephrolepis exaltata, Doodia* sp., *Bidens* sp., *Melicope* sp., *Acacia koa, Metrosideros polymorpha, Psydrax odorata, Dodonaea viscosa,* or *Eragrostis grandis;* and

(*2*) Elevations between 578 and 941 m (1,896 and 3,086 ft).

Family Primulaceae: Lysimachia filifolia (no common name)

Oahu L, identified in the legal description in (a)(1)(i)(I), constitutes critical habitat for *Lysimachia filifolia* on Oahu. Within this unit, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Mossy banks at the base of cliff faces within the spray zone of waterfalls or along streams in lowland wet forests containing one or more of the following associated native plant species: mosses, ferns, liverworts, or Pilea peploides; and

(*2*) Elevations between 65 and 798 m (213 and 2,617 ft).

Family Rhamnaceae: Colubrina oppositifolia (kauila)

Oahu A, identified in the legal description in (a)(1)(i)(I), constitutes critical habitat for *Colubrina oppositifolia* on Oahu. Within this unit, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Lowland dry or mesic forests dominated by *Diospyros sandwicensis* containing one or more of the following associated native plant species: *Alyxia oliviformis, Nestegis sandwicensis, Sapindus oahuensis, Psydrax odorata,* or *Reynoldsia sandwicensis;* and

(*2*) Elevations between 277 and 761 m (909 and 2,496 ft).

Family Rhamnaceae: Gouania meyenii (NCN)

Oahu A, I, and X, identified in the legal descriptions in (a)(1)(i)(I), constitute critical habitat for *Gouania meyenii* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Moderate to steep slopes in dry shrubland or mesic lowland forest containing one or more of the following associated native plant species: *Diospyros sandwicensis, Charpentiera* sp., *Alyxia oliviformis, Pisonia* sp., *Hibiscus* sp., *Canavalia* sp., *Sophora chrysophylla, Sida fallax, Schiedea* sp., *Dubautia sherffiana, Psydrax odorata, Eragrostis* sp., *Dryopteris unidentata, Sapindus oahuensis, Myrsine* sp., *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 323 to 1,006 m (1,059 to 3,300 ft).

Family Rhamnaceae: Gouania vitifolia (NCN)

Oahu A, B, D, and P, identified in the legal descriptions in (a)(1)(i)(I), constitute critical habitat for *Gouania vitifolia* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Sides of ridges or gulches in dry to mesic forests containing one or more of the following associated native plant species: *Erythrina sandwicensis, Dodonaea viscosa, Hibiscus arnottianus, Pipturis albidus, Urera glabra, Chamaesyce* sp., *Psychotria* sp., *Hedyotis* sp., *Melicope* sp., *Nestegia sandwicensis, Bidens* sp., *Carex meyenii,* or *Diospyros sandwicensis;* and

(*2*) Elevation between 39 to 978 m (128 to 3,208 ft).

Family Rubiaceae: Gardenia mannii (nanu)

Oahu A, I, and L, identified in the legal descriptions in (a)(1)(i)(I), constitute critical habitat for *Gardenia mannii* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Moderate to moderately steep gulch slopes, ridge crests, gulch bottoms, and streambanks in mesic or wet forests containing one or more of the following associated native plant species *Coprosma foliosa, Pisonia* sp., *Bobea* sp., *Syzygium sandwicensis, Melicope* sp., *Cheirodendron* sp., *Perotettia* sp., *Elaeocarpus* sp., *Cibotium* sp., *Thelypteris* sp., *Pipturus* sp., *Ilex anomala, Freycinetia arborea, Boehmeria grandis, Metrosideros polymorpha, Pouteria sandwicensis, Acacia koa, Dicranopteris linearis, Antidesma platyphyllum, Broussaisia arguta, Hedyotis acuminata, Alyxia oliviformis, or Psychotria mariniana;* and

(*2*) Elevations between 82 and 1,050 m (269 and 3,444 ft).

Family Rubiaceae: Hedyotis coriacea (kioele)

Oahu I and L, identified in the legal descriptions in (a)(1)(i)(I), constitute critical habitat for *Hedyotis coriacea* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Steep, rocky, slopes in dry to mesic *Dodonaea viscosa* dominated shrublands or forests containing one or more of the following associated native plant species: *Metrosideros polymorpha, Styphelia tameiameiae,* or *Alyxia oliviformis;* and

(*2*) Elevations between 57 and 836 m (187 and 2,742 ft).

Family Rubiaceae: Hedyotis degeneri (NCN)

Oahu A, identified in the legal description in (a)(1)(i)(I), constitutes critical habitat for *Hedyotis degeneri* on Oahu. Within this unit, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Ridge crests in diverse mesic forest containing one or more of the following associated native plant species *Styphelia tameiameiae, Dicranopteris linearis, Wikstroemia oahuensis,*

Dodonaea viscosa, Alyxia oliviformis, Diospyros sandwicensis, Psychotria hathewayi, Cocculus sp., *Lysimachia hillebrandii, Chamaesyce multiformis, Lobelia yuccoides, Gahnia* sp., *Pleomele* sp., *Carex meyenii, Psydrax odorata, Metrosideros polymorpha,* or *Hedyotis terminalis;* and

(*2*) Elevations between 349 and 1,083 m (1,145 and 3,552 ft).

Family Rubiaceae: Hedyotis parvula (NCN)

Oahu A and I, identified in the legal descriptions in (a)(1)(i)(I), constitute critical habitat for *Hedyotis parvula* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Cliff faces or their bases, rock outcrops, or ledges in mesic habitat containing one or more of the following associated native plant species: *Eragrostis* sp., *Carex* sp., *Rumex* sp., *Metrosideros polymorpha*, *Chamaesyce* sp., *Bidens* sp., *Dodonaea viscosa*, *Psydrax odorata*, *Metrosideros tremuloides*, or *Plectranthus parviflorus*; and

(*2*) Elevations between 331 and 1,160 m (1,086 and 3,805 ft).

Family Rutaceae: Melicope lydgatei (alani)

Oahu L, identified in the legal description in (a)(1)(i)(I), constitutes critical habitat for *Melicope lydgatei* on Oahu. Within this unit, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Ridges in mesic or wet forests containing one or more of the following associated native plant species: *Acacia koa*, *Metrosideros polymorpha*, *Dicranopteris linearis*, *Psychotria* sp., *Syzygium sandwicensis*, or *Bobea elatior*; and

(*2*) Elevations between 349 and 671 m (1,145 and 2,201 ft).

Family Rutaceae: Melicope pallida (alani)

Oahu A and I, identified in the legal descriptions in (a)(1)(i)(I), constitute critical habitat for *Melicope pallida* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Steep rock faces in lowland dry or mesic forests containing one or more of the following associated native plant species: *Psychotria mariniana*, *Bobea elatior*, *Acacia koa*, *Cibotium* sp., *Wikstroemia oahuensis*, *Syzygium sandwicensis*, *Abutilon sandwicense*, *Alyxia oliviformis*, *Dryopteris* sp., *Metrosideros polymorpha*, *Pipturus albidus*, *Sapindus oahuensis*, *Tetraplasandra* sp., or *Xylosma hawaiiense*; and

(*2*) Elevations between 234 to 841 m (768 to 2,758 ft).

Family Rutaceae: Melicope saint-johnii (alani)

Oahu I, identified in the legal description in (a)(1)(i)(I), constitutes critical habitat for *Melicope saint-johnii* on Oahu. Within this unit, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Ridges or gulch bottoms in mesic forest containing one or more of the following associated native plant species: *Artemisia australis*, *Eragrostis* sp., *Hedyotis schlechtendahliana*, *Lysimachia hillebrandii*, *Bidens torta*, *Alyxia oliviformis*, *Carex wahuensis*, *Panicum beechyi*, *Rumex albescens*, *Pittosporum* sp., *Pleomele halapepe*, *Pipturus albidus*, *Metrosideros polymorpha*, *Coprosma longifolia*, *Labordia kaalae*, or *Psychotria hathewayi*; and

(*2*) Elevations between 240 and 953 m (787 and 3,126 ft).

Family Sapindaceae: Alectryon macrococcus (mahoe)

Oahu A and I, identified in the legal descriptions in (a)(1)(i)(I), constitute critical habitat for *Alectryon macrococcus* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Slopes, ridges, or gulches within mesic lowland forests containing one or more of the following associated native plant species: *Pisonia sandwicensis*, *Elaeocarpus bifidus*, *Streblus pendulinus*, *Psychotria hathewayi*, *Pouteria sandwicensis*, *Pisonia umbellifera*, *Diplazium sandwichianum*, *Claoxylon sandwicense*, *Neraudia* sp., *Pipturus albidus*, *Diospyros hillebrandii*, *Charpentiera* sp., *Hibiscus arnottianus*, *Metrosideros polymorpha*, *Diospyros sandwicensis*, *Nestegis sandwicensis*, *Pisonia* sp., *Xylosma* sp., *Antidesma platyphyllum*, *Myrsine lanaiensis*, *Psydrax odorata*, *Canavalia* sp., or *Alyxia oliviformis;* and

(*2*) Elevations between 367 and 941 m (1,204 and 3,086 ft).

Family Solanaceae: Solanum sandwicense (aiakeaakua, popolo)

Oahu A, I, and L, identified in the legal descriptions in (a)(1)(i)(I), constitute critical habitat for *Solanum sandwicense* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Talus slopes or streambeds in open, sunny areas containing one or more of the following associated native plant species: *Pisonia* sp. or *Psychotria* sp.; and

(*2*) Elevations between 131 and 1,006 m (430 and 3,300 ft).

Family Urticaceae: Neraudia angulata (NCN)

Oahu A and I, identified in the legal descriptions in (a)(1)(i)(I), constitute critical habitat for *Neraudia angulata* var. *angulata* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Slopes, ledges, or gulches in lowland mesic or dry forest containing one or more of the following associated native plant species: *Diospyros* sp., *Dodonaea viscosa*, *Bidens* sp., *Artemisia australis*, *Sida fallax*, *Carex meyenii*, *Psydrax odorata*, *Hibiscus* sp., *Pisonia sandwicensis*, or *Nestegis sandwicensis*; and

(*2*) Elevations between 189 and 978 m (620 and 3,208 ft).

Oahu A, B, D, and I, identified in the legal descriptions in (a)(1)(i)(I), constitute critical habitat for *Neraudia angulata* var. *dentata* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Cliffs, rock embankments, gulches, or slopes in mesic or dry forests containing one or more of the following associated native plant species: *Diospyros sandwicensis*, *Diospyros hillebrandii*, *Dodonaea viscosa*, *Artemisia australis*, *Alyxia oliviformis*, *Sapindus oahuensis*, *Psydrax odorata*, *Pisonia* sp., *Antidesma pulvinatum*, *Nestegis sandwicensis*, *Myrsine lanaiensis*, *Hibiscus* sp., *Metrosideros polymorpha, Bidens torta*, *Canavalia* sp., *Rauvolfia sandwicensis, Carex* sp., *Charpentiera* sp., *Sida fallax*, *Streblus pendulinus*, or *Eragrostis* sp.; and

(*2*) Elevations between 110 and 978 m (361 and 3,208 ft).

Family Urticaceae: Urera kaalae (opuhe)

Oahu A and I, identified in the legal descriptions in (a)(1)(i)(I), constitute critical habitat for *Urera kaalae* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Slopes or gulches in diverse mesic forest containing one or more of the following associated native plant species: *Hibiscus* sp., *Alyxia oliviformis*, *Canavalia* sp., *Charpentiera* sp., *Senna*

gaudichaudii, *Claoxylon sandwicense*, *Pleomele* sp., *Xylosma hawaiiense*, *Chamaesyce* sp., *Antidesma platyphyllum*, *Athyrium* sp., *Streblus pendulinus*, *Hedyotis acuminata*, *Asplenium kaulfusii*, *Doryopteris* sp., *Pouteria sandwicensis*, *Claoxylon sandwicense*, *Freycinetia arborea*, *Pipturus albidus*, *Urera glabra*, *Psychotria* sp., *Diospyros hillebrandii*, or *Nestegis sandwicensis*; and

(*2*) Elevations between 439 and 1074 m (1,440 and 3,523 ft).

Family Violaceae: Isodendrion laurifolium (aupaka)

Oahu A and L, identified in the legal descriptions in (a)(1)(i)(I), constitute critical habitat for *Isodendrion laurifolium* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Gulch slopes, ravines, or ridges in diverse mesic or dry forest dominated by *Metrosideros polymorpha*, *Acacia koa*, *Eugenia reinwardtiana*, or *Diospyros sandwicensis* containing one or more of the following associated native plant species: *Nestegis sandwicensis, Hibiscus arnottianus, Alyxia oliviformis, Rauvolfia sandwicensis, Psydrax odorata, Carex wahuensis, Charpentiera tomentosa, Doodia* sp., *Dryopteris unidentata, Sapindus* sp., *Antidesma pulvinatum, Smilax melastomifolia, Antidesma platyphyllum, Xylosma hawaiiense, Hedyotis terminalis, Pisonia* sp., or *Pouteria sandwicensis;* and

(*2*) Elevations between 90 and 959 m (295 and 3,146 ft).

Family Violaceae: Isodendrion longifolium (aupaka)

Oahu A and L, identified in the legal descriptions in (a)(1)(i)(I), constitute critical habitat for *Isodendrion longifolium* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Steep slopes or stream banks in mixed mesic or lowland wet *Metrosideros polymorpha-Dicranopteris linearis* forest containing one or more of the following associated native plant species: *Syzygium sandwicensis*, *Pouteria sandwicensis*, *Acacia koa*, *Psydrax odoratum*, *Alyxia oliviformis*, *Melicope* sp., *Pittosporum* sp., *Carex* sp., *Selaginella arbuscula*, *Isachne pallens*, *Bobea brevipes*, *Antidesma* sp., *Cyanea* sp., *Cyrtandra* sp., *Hedyotis terminalis*, *Peperomia* sp., *Perrottetia sandwicensis*, or *Psychotria* sp; and

(*2*) Elevations between 363 and 964 m (1,191 and 3,162 ft).

Family Violaceae: Isodendrion pyrifolium (wahine noho kula)

Oahu A, B, D, F, I, and P, identified in the legal descriptions in (a)(1)(i)(I), constitutes critical habitat for *Isodendrion pyrifolium* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Bare rocky hills or wooded ravines in dry shrublands from 363 to 964 m (1,191 to 3,162 ft.).

Family Violaceae: Viola chamissoniana ssp. chamissoniana (olopu)

Oahu A, G, and I, identified in the legal descriptions in (a)(1)(i)(I), constitute critical habitat for *Viola chamissoniana ssp. chamissoniana* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Dry cliffs, rocky ledges, or steep slopes in mesic shrubland or cliff vegetation containing one or more of the following associated native plant species: *Sida fallax*, *Chamaesyce* sp., *Dodonaea viscosa*, *Schiedea* sp., *Dubautia* sp., *Peperomia* sp., *Lipochaeta tenuis*, *Rumex* sp., *Artemisia australis*, *Bidens torta*, *Carex meyenii*, *Eragrostis* sp., *Metrosideros polymorpha*, or *Styphelia tameiameiae*; and

(*2*) Elevations between 414 and 1,149 m (1,358 and 3,769 ft).

Family Violaceae: Viola oahuensis (NCN)

Oahu L, identified in the legal description in (a)(1)(i)(I), constitutes critical habitat for *Viola oahuensis* on Oahu. Within this unit, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Exposed, windswept ridges of moderate to steep slope in wet *Metrosideros polymorpha-Dicranopteris linearis* shrublands or *Metrosideros polymorpha* mixed montane bogs in the cloud zone containing one or more of the following associated native plant species: *Broussaisia arguta*, *Cibotium* sp., *Labordia* sp., *Dubautia laxa*, *Wikstroemia* sp., *Hedyotis terminalis*, *Antidesma* sp., *Syzygium sandwicensis*, *Melicope* sp., *Bidens macrocarpa*, *Machaerina* sp., *Sadleria* sp., or *Vaccinium* sp.; and

(*2*) Elevations between 415 and 959 m (1,361 and 3,146 ft).

(B) Ferns and Allies.

Family Adiantaceae: Pteris lidgatei (NCN)

Oahu L, identified in the legal description in (a)(1)(i)(I), constitutes critical habitat for *Pteris lidgatei* on Oahu. Within this unit, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Steep stream banks or cliffs in wet *Metrosideros polymorpha-Dicranopteris linearis* forest containing one or more of the following associated native plant species: *Cyrtandra* sp., *Machaerina angustifolia, Selaginella arbuscula, Isachne pallens, Thelypteris sandwicensis, Diplolerygium pinnatum, Sadleria* sp., *Broussaisia arguta, Cibotium chamissoi, Dicranopteris linearis, Elaphoglossum crassifolium , Sadleria squarrosa, Asplenium* sp., *Doodia lyonii,* or *Sphenomeris chusana;* and

(*2*) Elevations around 75 m (246 ft).

Family Aspleniaceae: Ctenitis squamigera (pauoa)

Oahu A, identified in the legal description in (a)(1)(i)(I), constitutes critical habitat for *Ctenitis squamigera* on Oahu. Within this unit, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Gentle to steep slopes in *Metrosideros polymorpha-Diospyros sandwicensis* mesic forest or diverse mesic forest containing one or more of the following associated native plant species: *Alyxia oliviformis, Hibiscus* sp., *Diospyros hillebrandii, Nestegis sandwicensis, Psydrax odorata, Pouteria sandwicensis, Carex meyenii, Dodonaea viscosa, Freycinetia arborea, Pisonia* sp., *Dryopteris unidentata, Doodia kunthiana, Myrsine* sp., *Psychotria* sp., or *Xylosma* sp.; and

(*2*) Elevations between 387 to 923 m (1,269 to 3,027 ft).

Family Aspleniaceae: Diellia erecta (NCN)

Oahu L, identified in the legal description in (a)(1)(i)(I), constitutes critical habitat for *Diellia erecta* on Oahu. Within this unit, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Moderate to steep gulch slopes or sparsely vegetated rock faces in mesic forest containing one or more of the following associated native plant species: *Sapindus oahuensis, Psydrax odorata, Coprosma* sp., *Dodonaea viscosa, Dryopteris unidentata, Myrsine* sp., *Psychotria* sp., *Syzygium sandwicensis,* or *Wikstroemia* sp.; and

(*2*) Elevations between 118 and 550 m (387 and 1,804 ft).

Family Aspleniaceae: Diellia falcata (NCN)

Oahu A and I, identified in the legal descriptions in (a)(1)(i)(I), constitutes critical habitat for *Diellia falcata* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Deep shade or open understory on moderate to moderately steep slopes and gulch bottoms in diverse mesic forest containing one or more of the following associated native plant species: *Pisonia sandwicensis, Doodia kunthiana, Dryopteris unidentata, Antidesma* sp., *Nestegis sandwicensis, Alyxia oliviformis, Psydrax odorata, Pipturis* sp., *Metrosideros polymorpha, Freycinetia arborea, Athyrium sandwichianum, Dryopteris unidentata, Nephrolepis exaltata, Diospyros hillebrandii, Acacia koa, Elaeocarpus bifidus, Myrsine lanaiensis, Selaginella arbuscula, Carex meyenii, Sophora chrysophylla, Claoxylon sandwicense, Psychotria* sp., *Hibiscus* sp., *Xylosma* sp., *Melicope* sp., *Coprosma foliosa, Asplenium kaulfussii, Nothocestrum* sp., *Charpentiera* sp., *Hedyotis terminalis, Sapindus oahuensis, Diospyros sandwicensis,* or *Pouteria sandwicensis;* and

(*2*) Elevations between 224 and 953 m (735 and 3,126 ft).

Family Aspleniaceae: Diellia unisora (NCN)

Oahu I, identified in the legal description in (a)(1)(i)(I), constitutes critical habitat for *Diellia unisora* on Oahu. Within this unit, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Moderate to steep slopes or gulch bottoms in deep shade or open understory in mesic forest containing one or more of the following associated native plant species: *Coprosma* sp., *Rumex* sp., *Antidesma* sp., *Psychotria* sp., *Carex meyenii, Dryopteris unidentata, Chamaesyce multiformis, Dodonaea viscosa, Bidens torta, Eragrostis grandis, Hedyotis terminalis, Alyxia oliviformis, Myrsine lessertiana, Hedyotis schlechtendahliana, Selaginella arbuscula, Acacia koa,* or *Metrosideros polymorpha;* and

(*2*) Elevations between 382 and 953 m (1,253 and 3,126 ft).

Family Aspleniaceae: Diplazium molokaiense (NCN)

Oahu A, identified in the legal description in (a)(1)(i)(I), constitutes critical habitat for *Diplazium molokaiense* on Oahu. Within this unit, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Steep rocky wooded gulch walls in wet forests; and

(*2*) Elevations around 450 m (1,476 ft).

Family Grammitidaceae: Adenophorus periens (pendant kihi fern)

Oahu L, identified in the legal description in (a)(1)(i)(I), constitutes critical habitat for *Adenophorus periens* on Oahu. Within this unit, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Trees in *Metrosideros polymorpha* or *Metrosideros rugosa* wet forests containing one or more of the following associated native plant species: *Dicranopteris linearis, Cheirodendron* spp., *Machaerina angustifolia, Syzygium sanwicensis, Hedyotis terminalis,* or *Cibotium* sp.; and

(*2*) Elevations between 618 to 1,202 m (2,027 to 3,943 ft).

Family Lycopodiaceae: Phlegmariurus nutans (wawaeiole)

Oahu L, identified in the legal description in (a)(1)(i)(I), constitutes critical habitat for *Phlegmariurus nutans* on Oahu. Within this unit, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Tree trunks, open ridges, forested slopes, or cliffs in *Metrosideros polymorpha* dominated wet forests, cliffs, or shrublands or mesic forests containing one or more of the following associated native plant species: *Machaerina angustifolia, Wikstroemia oahuensis, Antidesma platyphyllum, Syzygium sandwicensis, Elaphoglossum* sp., *Hibiscus* sp., *Psychotria mariniana, Cyrtandra laxiflora, Hedyotis terminalis, Broussaisia arguta,* or *Dicranopteris linearis;* and

(*2*) Elevations between 227 and 846 m (745 and 2,775).

Family Marsileaceae: Marsilea villosa (ihi ihi)

Oahu J, K, W, and X, identified in the legal description in (a)(1)(i)(I), constitutes critical habitat for *Marsilea villosa* on Oahu. Within these units, currently known primary constituent elements of critical habitat are the habitat components provided by:

(*1*) Cinder craters, vernal pools surrounded by lowland dry forest vegetation, mud flats, or lowland grasslands containing *Sida fallax;* and

(*2*) Elevations between 424 and 1,032 m (1,391 and 3,385 ft).

Dated: May 2, 2002.

Craig Manson,

Assistant Secretary for Fish and Wildlife and Parks.

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