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50 CFR Part 17

**Endangered and Threatened Wildlife and
Plants; Determinations of Prudency and
Proposed Designations of Critical Habitat
for Plant Species From the Islands of
Maui and Kahoolawe, Hawaii; Proposed
Rule**

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

RIN 1018-AH70

Endangered and Threatened Wildlife and Plants; Determinations of Prudency and Designations of Critical Habitat for Plant Species From the Islands of Maui and Kahoolawe, Hawaii

AGENCY: Fish and Wildlife Service, Interior.

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

SUMMARY: We, the U.S. Fish and Wildlife Service, have reconsidered our findings concerning whether designating critical habitat for 38 federally protected plants from the islands of Maui and Kahoolawe, some of which may also occur on other Hawaiian Islands, listed between 1991 and 1996, would be prudent. 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 have determined that critical habitat is prudent for 37 of these species since the potential benefits of designating critical habitat essential for the conservation of these species outweigh the risks of designation that may result from human activity. We propose that designation of critical habitat is not prudent for one species, which is no longer extant in the wild and for which no genetic material is currently extant, because such designation would not be beneficial to this species.

We propose critical habitat designations for a total of 50 species in 52 units on Maui and 4 units on Kahoolawe at this time. The approximate land area within these units totals 13,574 hectares (33,614 acres) on Maui and 207 hectares (512 acres) on Kahoolawe. This proposed rule includes proposed designations for 33 of the 37 species mentioned above. Critical habitat is not proposed for four species that are currently only found in areas on Maui that are permanently protected and managed. In addition, critical habitat is being proposed for six

other species from Maui and Kahoolawe that were listed in 1999. We are also proposing critical habitat on Maui and Kahoolawe for 11 species which also occur on Kauai.

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

DATES: We must receive comments from all interested parties by February 16, 2001. Public hearing requests must be received by February 1, 2001.

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

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.

You may send comments by electronic mail (e-mail) to mandk_crithab_pr@fws.gov. See the Public Comments Solicited section in **SUPPLEMENTARY INFORMATION** below for file format and other information about electronic filing.

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

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

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

SUPPLEMENTARY INFORMATION:**Background**

We, the U.S. Fish and Wildlife Service (Service), have reconsidered our previous findings concerning whether designating critical habitat for some of the 69 Federally protected plants currently or historically found on the islands of Maui and Kahoolawe is prudent. Table 1 lists the species that are currently found on Maui and/or

Kahoolawe, reported to occur on these islands, or were historically present (not seen for more than 30 years). Seventeen of these species (*Argyroxiphium sandwicense* ssp. *macrocephalum*, *Clermontia samuelii*, *Cyanea copelandii* ssp. *haleakalaensis*, *Cyanea glabra*, *Cyanea hamatiflora* ssp. *hamatiflora*, *Cyanea mceldowneyi*, *Dubautia plantaginea* ssp. *humilis*, *Geranium arboreum*, *Geranium multiflorum*, *Kanaloa kahoolawensis*, *Lipochaeta kamolensis*, *Melicope adscendens*, *Melicope balloui*, *Melicope ovalis*, *Remya mauiensis*, *Schiedea haleakalensis*, and *Tetramolopium capillare*) are endemic to the islands of Maui and/or Kahoolawe, while 33 species (*Alectryon macrococcus*, *Bonamia menziesii*, *Cenchrus agrimonoides*, *Centaurium sebaeoides*, *Clermontia lindseyana*, *Clermontia oblongifolia* ssp. *mauiensis*, *Colubrina oppositifolia*, *Ctenitis squamigera*, *Cyanea grimesiana* ssp. *grimesiana*, *Cyrtandra munroi*, *Diellia erecta*, *Flueggea neowawraea*, *Hedyotis coriacea*, *Hedyotis manni*, *Hesperomannia arborescens*, *Hesperomannia arbuscula*, *Hibiscus brackenridgei*, *Ischaemum byrone*, *Mariscus pennatiflorus*, *Melicope knudsenii*, *Melicope mucronulata*, *Neraudia sericea*, *Peucedanum sandwicense*, *Phyllostegia manni*, *Phyllostegia mollis*, *Plantago princeps*, *Platanthera holochila*, *Pteris lidgatei*, *Sanicula purpurea*, *Sesbania tomentosa*, *Spermolepis hawaiiensis*, *Vigna owahuensis*, and *Zanthoxylum hawaiiense*) are known from Maui and/or Kahoolawe, as well as one or more other islands (Table 1). Two species, *Bidens micrantha* ssp. *kalealaha* and *Cyanea lobata*, were known from Maui and Lanai, but are currently only extant on Maui. *Lysimachia lydgatei* was known from Maui and Oahu, while *Diplazium molokaiense* was known from several islands, but currently both species are extant only on Maui. We believe that one species, *Acaena exigua*, may be extinct. The fourteen remaining species are known only from historical records (pre-1970) on Maui and/or Kahoolawe or from undocumented observations. While these species do occur on other islands, we do not believe they still occur on Maui or Kahoolawe.

TABLE 1.—SUMMARY OF ISLAND DISTRIBUTION OF 69 SPECIES FROM MAUI AND KAHOOLAWE

Species (common name)	Island Distribution						
	Kauai	Oahu	Molokai	Lanai	Maui	Hawaii	N.W. Isles, Kahoolawe Nihoa
<i>Acaena exigua</i> (liliwai)	H				H		
<i>Alectryon macrococcus</i> (mahoe)	C	C	C		C		
<i>Argyroxiphium sandwicense</i> ssp. <i>macrocephalum</i> (ahinahina)					C		
<i>Asplenium fragile</i> var. <i>insulare</i> (NCN*)					H	C	
<i>Bidens micrantha</i> ssp. <i>kalealaha</i> (ko oko olau)				H	C		
<i>Bonamia menziesii</i> (NCN)	C	C	H	C	C	C	
<i>Brighamia rockii</i> (pua ala)			C	H	H		
<i>Cenchrus agrimonoides</i> (kamanomano)		C		H	C	R	NW Isles (H)
<i>Centaurium sebaeoides</i> (awiwai)	C	C	C	C	C		
<i>Clermontia lindseyana</i> (oha wai)				C	C	C	
<i>Clermontia oblongifolia</i> ssp. <i>mauiensis</i> (oha wai)				C	C	C	
<i>Clermontia peleana</i> (oha wai)					H	C	
<i>Clermontia samuelii</i> (oha wai)					C	C	
<i>Colubrina oppositifolia</i> (kauila)		C			C	C	
<i>Ctenitis squamigera</i> (pauoa)	H	C	H	C	C	H	
<i>Cyanea copelandii</i> ssp. <i>haleakalaensis</i> (haha)					C		
<i>Cyanea glabra</i> (haha)					C		
<i>Cyanea grimesiana</i> ssp. <i>grimesiana</i> (haha)		C	C	C	C		
<i>Cyanea hamatiflora</i> ssp. <i>hamatiflora</i> (haha)					C		
<i>Cyanea lobata</i> (haha)				H	C		
<i>Cyanea mceldowneyi</i> (haha)					C		
<i>Cyrtandra munroi</i> (ha iwale)				C	C		
<i>Delissea undulata</i> (NCN)	C				H	C	Ni (H)
<i>Diellia erecta</i> (Asplenium-leaved diellia)	H	H	C	H	C	C	
<i>Diplazium molokaiense</i> (NCN)	H	H	H	H	C		
<i>Dubautia plantaginea</i> ssp. <i>humilis</i> (na ena e)					C		
<i>Flueggea neowawraea</i> (mehamehame)	C	C	H		C	C	
<i>Geranium arboreum</i> (nohoanu)					C		
<i>Geranium multiflorum</i> (nohoanu)					C		
<i>Gouania vitifolia</i> (NCN)		C			H	C	
<i>Hedyotis coriacea</i> (kioele)		H			C	C	
<i>Hedyotis mannii</i> (pilo)			C	C	C		
<i>Hesperomannia arborescens</i> (NCN)		C	C	H	C		
<i>Hesperomannia arbuscula</i> (NCN)		C			C		
<i>Hibiscus brackenridgei</i> (mao hau hele)	H	C	H	C	C	C	Ka (R)
<i>Ischaemum byrone</i> (Hilo ischaemum)	R	H	C	D	C	C	
<i>Isodendron pyriforme</i> (wahine noho kula)		H	H	H	H	C	Ni (H) Ka (C)
<i>Kanaloa kahoolawensis</i> (kohe malama malama o kanaloa)							
<i>Lipochaeta kamolensis</i> (nehe)					C		
<i>Lysimachia lydgatei</i> (NCN)		H			C		
<i>Mariscus pennatifolius</i> (NCN)	H	H			C	H	NW Isles (C)
<i>Melicope adscendens</i> (alani)					C		
<i>Melicope balloui</i> (alani)					C		
<i>Melicope knudenii</i> (alani)	C				C		
<i>Melicope mucronulata</i> (alani)			C		C		
<i>Melicope ovalis</i> (alani)					C		
<i>Neraudia sericea</i> (NCN)			C	H	C		Ka (H)
<i>Nototrichium humile</i> (kului)		C			H		
<i>Peucedanum sandwicense</i> (makou)	C	C	C		C		
<i>Phegmariurus mannii</i> (wawae iole)	H				C	C	
<i>Phytotegia mannii</i> (NCN)			C		H		
<i>Phyllostegia mollis</i> (NCN)		C	H		C		
<i>Phyllostegia parviflora</i> (NCN)		C			H	H	
<i>Plantago princeps</i> (laukahi kuahiwi)	C	C	C		C		
<i>Plantanthera holochila</i> (NCN)	C	H	C		C		
<i>Peteris lidgatei</i> (NCN)		C	H		C		
<i>Remya mauiensis</i> (NCN)					C		
<i>Sanicula purpurea</i> (NCN)		C			C		
<i>Schiedea haleakalensis</i> (NCN)					C		
<i>Schiedea hookeri</i> (NCN)		C			H		
<i>Schiedea nuttallii</i> (NCN)	C	C	C		R		
<i>Sesbania tomentosa</i> (NCN)	C	C	C	H	C	C	Ni (H), Ka (C), NW Isles (C)
<i>Solanum incompletum</i> (popolo ku mai)	H		H	H	H	C	
<i>Sptermolepis hawaiiensis</i> (NCN)	C	C	C	C	C	C	
<i>Tetramolopium arenarium</i> (NCN)						H	C
<i>Tetramolopium capillare</i> (pamakani)					C		
<i>Tetramolopium remyi</i> (NCN)				C	H		

TABLE 1.—SUMMARY OF ISLAND DISTRIBUTION OF 69 SPECIES FROM MAUI AND KAHOO LAWE—Continued

Species (common name)	Island Distribution						
	Kauai	Oahu	Molokai	Lanai	Maui	Hawaii	N.W. Isles, Kahoolawe Nihoa
<i>Vigna o-waheuensis</i> (NCN)		H	C	C	C	C	Ni (H), Ka (C)
<i>Zanthoxylum hawaiiense</i> (a w)	C		C	H	C	C	
KEY							

C (Current)—population last observed within the past 30 years.
 H (Historical)—population not seen for more than 30 years.
 R (Reported)—reported from undocumented observations.
 * NCN—no common name.

When 38 of the above species were listed between 1991 and 1996 (*Acaena exigua*, *Argyroxiphium sandwicense* ssp. *macrocephalum*, *Bidens micrantha* ssp. *kalealaha*, *Cenchrus agrimonoides*, *Clermontia lindseyana*, *Clermontia oblongifolia* ssp. *mauiensis*, *Colubrina oppositifolia*, *Ctenitis squamigera*, *Cyanea grimesiana* ssp. *grimesiana*, *Cyanea lobata*, *Cyanea mceldowneyi*, *Cyrtandra munroi*, *Diellia erecta*, *Diplazium molokaiense*, *Geranium arboreum*, *Geranium multiflorum*, *Hedyotis coriacea*, *Hedyotis mannii*, *Hesperomannia arborescens*, *Hesperomannia arbuscula*, *Hibiscus brackenridgei*, *Ischaemum byrone*, *Lipochaeta kamolensis*, *Lysimachia lydgatei*, *Mariscus pennatiflorus*, *Melicope adscendens*, *Melicope balloui*, *Melicope mucronulata*, *Melicope ovalis*, *Neraudia sericea*, *Phlegmariurus mannii*, *Phyllostegia mollis*, *Pteris lidgatei*, *Remya mauiensis*, *Sanicula purpurea*, *Schiedea haleakalensis*, *Tetramolopium capillare*, and *Vigna o-wahuensis*), 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. However, after reevaluating our previous decision, we propose that critical habitat designation for 37 of these species would be prudent because the potential benefits of designating critical habitat essential for the conservation of these species outweigh the risks, resulting from human activity, of designation (see CRITICAL HABITAT section below). We propose that designation of critical habitat is not prudent for *Acaena exigua*, which we believe may be extinct, because such a designation would not be beneficial to this species, since we believe the species may be extinct.

Proposed determinations for 11 species that also occur on the island of Kauai (*Alectryon macrococcus*, *Bonamia menziesii*, *Centaurium sebaeoides*, *Flueggea neowawraea*, *Melicope knudsenii*, *Peucedanum sandwicense*, *Plantago princeps*,

Platanthera holochila, *Sesbania tomentosa*, *Spermolepis hawaiiensis*, and *Zanthoxylum hawaiiense*) were published in a previous proposal (65 FR 66808). In addition, the designation of critical habitat was found to be prudent for six species (*Clermontia samuelii*, *Cyanea copelandii* ssp. *haleakalaensis*, *Cyanea glabra*, *Cyanea hamatiflora* ssp. *hamatiflora*, *Dubautia plantaginea* ssp. *humilis*, and *Kanaloa kahoolawensis*) when they were listed as endangered in 1999.

An additional 14 species listed in Table 1 are known only from historical records (pre-1970) on Maui and/or Kahoolawe or from undocumented observations. Since these species do not currently occur on Maui or Kahoolawe, is it not prudent to designate critical habitat for them on these islands. However, proposed determinations and critical habitat designations or non-designations for these species will be included in other proposed rules for the islands on which they currently occur (Table 2).

TABLE 2.—PROPOSED RULES IN WHICH PRUDENCY AND CRITICAL HABITAT DESIGNATIONS/NON-DESIGNATIONS WILL BE PROPOSED FOR 14 SPECIES THAT NO LONGER OCCUR ON MAUI OR KAHOO LAWE.

SPECIES	Proposed rule in which prudency will be proposed	Proposed rule in which critical habitat designations/non designations will be discussed
<i>Asplenium fragile</i> var <i>insulare</i>	Hawaii	Hawaii
<i>Brighamia rockii</i>	Molokai	Molokai
<i>Clermontia peleana</i>	Hawaii	Hawaii
<i>Delissea undulata</i>	Hawaii	Hawaii
<i>Gouania vitifolia</i>	Hawaii	Hawaii; Oahu
<i>Isodendron pyriform</i>	Hawaii	Hawaii
<i>Nototrichium humile</i>	Oahu	Oahu
<i>Phyllostegia mannii</i>	Oahu	Oahu
<i>Phyllostegia parviflora</i>	Oahu	Oahu
<i>Schiedea hookeri</i>	Oahu	Oahu
<i>Schiedea nuttallii</i>	Kauai (65 FR 66808)	Kauai; Oahu; Molokai
<i>Solanum incompletum</i>	Hawaii	Hawaii
<i>Tetramolopium arenarium</i>	Hawaii	Hawaii
<i>Tetramolopium remyi</i>	Lanai	Lanai

The plants discussed in this proposed rule were listed as endangered or threatened species under the Endangered Species Act of 1973, as amended (Act), between 1991 and 1999.

At the time many of these plants were listed, we determined that designation of critical habitat was not prudent because designation would increase the degree of threat to the species and/or

would not benefit the plant. These not prudent determinations, along with 196 others, were challenged in *Conservation Council for Hawaii v. Babbitt*, 2 F. Supp. 2d 1280 (D. Hawaii). On March 9, 1998,

the United States District Court for the District of Hawaii directed us to review the prudency determinations for 245 listed plant species in Hawaii. On August 10, 1998, the court ordered us to publish proposed critical habitat designations or non-designations for at least 100 species by November 30, 2000, and to publish proposed designations or non-designations for the remaining 145 species by April 30, 2002. (See 65 FR 66808 for complete discussion about the above litigation.)

In addition, a second court order (*Conservation Council for Hawaii v. Babbitt*, Civ. No. 99-002283 HG (D. Haw. Aug. 19, 1999, Feb. 16, 2000, and March 28, 2000)) requires that we propose critical habitat for 10 other plant species, 6 of which are addressed in this proposed rule (*Clermontia samuelii*, *Cyanea copelandii* ssp. *haleakalaensis*, *Cyanea glabra*, *Cyanea hamatiflora* ssp. *hamatiflora*, *Dubautia plantaginea* ssp. *humilis*, *Kanaloa kahoolawensis*) for which determination was found to be prudent at the time of listing. This second court order requires us to publish proposed critical habitat designations by November 30, 2000, and to publish final critical habitat designations by November 30, 2001.

To comply with these court orders, we plan to publish seven proposed rules, between now and April 30, 2002, in the following island groupings: Kauai and Niihau; Maui and Kahoolawe; Lanai; Molokai; Northwest Hawaiian Islands; Hawaii; and Oahu. Each notice will contain the proposed prudency determinations for species occurring on that island for which prudency determinations have not been previously proposed, and proposed designations or non-designations of critical habitat for each plant species known to occur from that island. The proposed prudency determination and proposed rule for Kauai and Niihau plants was published in the **Federal Register** on November 7, 2000 (65 FR 66808). When a plant species occurs on more than one island, critical habitat may be proposed in all of the proposed rules that cover the respective islands.

The Islands of Maui and Kahoolawe

Maui, the second largest island in Hawaii at 1,888 square kilometers (sq km) (729 square miles (sq mi)) in area, was formed from the remnants of two large shield volcanoes, the older west Maui volcano (1.3 million years) on the west and the larger, but much younger Haleakala volcano on the east. Stream erosion has cut deep valleys and ridges into the originally shield-shaped West Maui volcano. The highest point on West Maui is Puu Kukui at 1,764 meters

(m) (5,787 feet (ft)) elevation, which has an average rainfall of 1,020 centimeters (cm) (400 inches (in.)) per year, making it the second wettest spot in Hawaii (Department of Geography 1998). Having erupted just 200 years ago, East Maui's Haleakala crater, reaching 3,055 m (10,023 ft) in elevation, has retained its classic shield shape and lacks the diverse vegetation typical of the older and more eroded West Maui mountain. Rainfall on the slopes of Haleakala is about 89 cm (35 in.) per year, with its windward (northeastern) slope receiving the most precipitation. However, Haleakala's crater is a dry cinder desert because it is below the level at which precipitation develops, and is sheltered from moisture-laden winds (Gagne and Cuddihy 1999).

The island of Kahoolawe measures about 17.7 km (11 mi) long by 11.3 km (7 mi) wide, comprising some 11,655 hectares (ha) (28,800 acres (ac)). Located in the lee of Haleakala, the island lies approximately 11 km (6.7 mi) from East Maui. The highest point is the rim of an extinct volcano at 450 m (1,477 ft) above sea level. The estimated annual precipitation is approximately 500 millimeters (mm) (20 in.), with most of it falling from November through March. In addition to the low precipitation, Kahoolawe is the windiest of the Hawaiian Islands (Gon et al. 1992).

Discussion of the Plant Taxa

Species Endemic to Maui and/or Kahoolawe

Argyroxiphium sandwicense ssp. *macrocephalum*

Argyroxiphium sandwicense ssp. *macrocephalum*, a long-lived perennial and a member of the aster family (Asteraceae), is called the Haleakala silversword. It is a distinctive, globe-shaped rosette plant with a dense covering of silver hairs. This subspecies is distinguished from *Argyroxiphium sandwicense* ssp. *sandwicense* by the shape and ratio of the dimensions of the inflorescence, the number of ray florets per head, and the combination of its longer, three-angled leaves; its silvery leaf hairs, which completely hide the leaf surface; and its longer achenes (Carr 1985, 1999a).

This monocarpic (flowers only once, at the end of its lifetime) plant matures from seed to its final stage in approximately 15–50 years (Loope and Medeiros, in press). The plant remains a compact rosette until it sends up an erect, central flowering stalk, sets seed, and dies. Flowering occurs from June to September, with annual numbers of flowering plants varying dramatically

from year to year. Reliable counts of flowering plants were made in 1935 (217 flowered) and in 1941 (815 flowered) (Loope and Crivellone 1986). Numbers recorded in recent years have ranged from zero in 1970 to 6,632 in 1991. The environmental stimulus for synchronous flowering is as yet unknown. An apparent relationship of the 1991 mass flowering event to stratospheric alteration by the eruption of Pinatubo Volcano in the Philippines has been considered. Investigations are underway by R. Pharis of the University of Calgary and L.L. Loope to explore whether enhanced flowering is related to increased UV-B radiation due to temporary reduction of stratospheric ozone (United States Fish and Wildlife Service (USFWS) 1997). Flying insects, especially native bees, moths, flies, bugs, and wasps, many of which are pollinators, are attracted in large numbers to the giant, aromatic inflorescences. It has been demonstrated that *Argyroxiphium sandwicense* ssp. *macrocephalum* cannot fertilize itself and is reliant on insect pollinators for reproduction. Rarely, hybrids between *A. sandwicense* ssp. *macrocephalum* and *Dubautia menziesii*, have been observed. Primarily found within Haleakala Crater, especially on Puu o Pele and Puu o Maui cinder cones, these hybrid individuals flower for several years before dying (Carr 1985).

Currently, *Argyroxiphium sandwicense* ssp. *macrocephalum* occupies all of its historic range, a 1,000 ha (2,500 ac) area at 2,100–3,000 m (6,890–9,840 ft) elevation in the crater and outer slopes of Haleakala Volcano, within Haleakala National Park, and The Nature Conservancy of Hawaii's (TNCH) Waikamoi Preserve (Loope and Crivellone 1986; TNC 1998). There are a total of seven populations on Federal and privately owned land, with 39,013 to 44,013 individual plants (TNCH 1998; Geographic Decision Systems International (GDSI) 2000; Hawaii Natural Heritage Program (HINHP) Database 2000).

The habitat of this species consists primarily of dry, well-drained, otherwise barren, unstable slopes of recent (less than several thousand years old) volcanic cinder cones. Mean annual precipitation is approximately 75–125 cm (29–49 in.). The substrate has almost no soil development and is subject to frequent formation of ice at night and extreme heating during cloudless days (USFWS 1997). This species is found in alpine dry shrubland with native species including: *Agrostis sandwicensis* (bent grass), *Deschampsia nubigena* (hair grass), *Dubautia menziesii* (na ena e), *Silene*

struthiolooides (catchfly), *Styphelia tameiameia* (pukiawe), *Metrosideros polymorpha* (ohia), *Tetramolopium humile* (pamakani), and *Trisetum glomeratum* (pili uka) (USFWS 1997).

The threats to this species are loss of pollinators due to the Argentine ant (*Iridomyrmex humilis*) and alien yellowjackets (*Vespula pennsylvanica*); native seed-eating and herbivorous insects such as the tephritid fly (*Trupanea cratericola*), the larvae of a native phycitid moth (*Rhynchephestia rhabdotis*), and the endemic cerambycid beetle (*Plagithmysus terryi*); limited natural range which makes it vulnerable to extinction due to catastrophic events, such as a natural disaster; competition from the alien plant species *Verbascum thapsus* (mullein) and *Pennisetum setaceum* (fountain grass); and human impacts (trampling and site degradation). Although goats (*Capra hircus*) and cattle (*Bos taurus*) have been removed from the park, they remain a potential threat (USFWS 1997; 57 FR 20772).

Clermontia samuelii

Clermontia samuelii, a short-lived perennial in the bellflower family (Campanulaceae), is a terrestrial shrub with elliptical leaves which are sometimes broader at the tips. *Clermontia samuelii* ssp. *hanaensis* is differentiated from *C. samuelii* ssp. *samuelii* by the greenish white to white flowers; longer, narrower leaves with the broadest point near the base of the leaves; and fewer hairs on the lower surface of the leaves. This species is separated from other members of this endemic Hawaiian genus by the size of the flowers and the hypanthium (Lammers 1999).

There is very little known about the life history of this plant. Reproductive cycles, longevity, specific environmental requirements, and limiting factors are unknown (USFWS 1999).

Historically, *Clermontia samuelii* has been reported from Haleakala and from Keanae Valley on the windward side to Manawainui on the more leeward (southeastern) side of Haleakala (Medeiros and Loope 1989; HINHP Database 2000). Currently, *C. samuelii* ssp. *hanaensis* is known from the northeastern side of Haleakala, within Haleakala National Park, Hanawi Natural Area Reserve (NAR), and Hana Forest Reserve. There is a total of five populations with 600 individual plants on State and Federal lands (HINHP Database 2000; GDSI 2000; B. Hobdy *in litt.* 2000; K. Wood *in litt.* 2000). *C. samuelii* ssp. *samuelii* is known from three populations totaling 50 to 100

individuals on State and Federal lands within Haleakala National Park, Hanawi NAR, and the Hana and Koolau forest reserves (Warshauer 1998; USFWS 1999; GDSI 2000; HINHP Database 2000; K. Wood *in litt.* 2000).

Clermontia samuelii ssp. *hanaensis* is found between 735 and 1,060 m (2,400 and 3,475 ft) elevation, while *C. samuelii* ssp. *samuelii* is typically found between 1,725 to 2,100 m (5,660 to 6,900 ft) elevation (64 FR 48307; HINHP Database 2000; K. Wood *in litt.* 2000). *C. samuelii* ssp. *hanaensis* is found in wet *Metrosideros polymorpha* and *M. polymorpha-Dicranopteris linearis* (uluhe) forest with *Tetraplasandra oahuensis* (ohe mauka), *Hedyotis terminalis* (manono), *Hedyotis hillebrandii* (manono), *Broussaisia arguta* (kanawao), *Cibotium* sp. (hapuu), *Argyroxiphium grayanum* (greensword), *Dubautia* sp. (na ena e), *Clermontia arborea* (oha wai), *Psychotria mariniana* (kopiko), *Melicope clusifolia* (alani), *Diplazium sandwichianum* (NCN), *Peperomia obovatilimba* (ala ala wai nui), *Adenophorus tamariscinus* (pendant fern), *Vaccinium* sp. (ohelo), *Carex alligata* (NCN), *Melicope* sp. (alani), and *Cheirodendron trigynum* (olapa) (HINHP Database 2000). *Clermontia samuelii* ssp. *samuelii* is found in wet *Metrosideros polymorpha* and *M. polymorpha-Cheirodendron trigynum* forest with *Hedyotis hillebrandii*, *Cibotium* sp., *Broussaisia arguta*, *Dubautia* sp., *Diplazium sandwichianum*, *Rubus hawaiiensis* (akala), *Clermontia arborescens* ssp. *waihia* (oha wai), *Vaccinium* sp., *Carex alligata*, and *Melicope* sp. (HINHP Database 2000).

Threats to *Clermontia samuelii* ssp. *hanaensis* include habitat degradation and/or destruction by feral pigs (*Sus scrofa*) and competition with alien plant taxa such as *Tibouchina herbacea* (glorybush), *Paspalum urvillei* (vasey grass), *Paspalum conjugatum* (Hilo grass), *Juncus* sp. (NCN), *Hedychium coronarium* (ginger), and *Hedychium gardnerianum* (64 FR 48307; K. Wood *in litt.* 2000). In addition, two extremely invasive alien plant taxa, *Miconia calvescens* (velvet tree) and *Clidemia hirta* (Koster's curse), are found in nearby areas and may invade this habitat if not controlled (64 FR 48307). The habitat of *C. samuelii* ssp. *samuelii* was extensively damaged by pigs in the past, and pigs are still a major threat to the populations on State owned lands. The population within the National Park has been fenced and pigs have been eradicated. However, due to the large populations of pigs in adjacent areas, the park populations must constantly be monitored to prevent

further occurrence (64 FR 48307). Competition with alien plant taxa such as *Holcus lanatus* (velvet grass) and *Juncus planifolius* (NCN) is a major threat to this subspecies (K. Wood *in litt.* 2000). In addition, rats (mainly black rat (*Rattus rattus*)) and slugs (mainly *Milax gagetes*) are known to eat leaves, stems, and fruits of other members of this genus, and therefore are a potential threat to both subspecies (64 FR 48307).

Cyanea copelandii ssp. *haleakalaensis*

Cyanea copelandii ssp. *haleakalaensis*, a short-lived perennial member of the bellflower family (Campanulaceae), is a vine-like shrub with sprawling stems and tan latex sap. This subspecies is differentiated from the other subspecies by its shorter elliptical leaves. The species differs from others in this endemic Hawaiian genus by the vine-like stems and the yellowish flowers that appear red due to the covering of hairs (Lammers 1999).

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

Historically, *Cyanea copelandii* ssp. *haleakalaensis* was reported from the windward side of Haleakala and from Waikamoi to Kipahulu Valley (Lammers 1999). Currently, this taxon is known from three populations with a total of 205 individuals in Kipahulu Valley within Haleakala National Park; west of Kuhiwa Stream and Valley in Hanawi NAR; and on lower Waikamoi flume, which is privately owned (64 FR 48307; Warshauer 1998; HINHP Database 2000; GDSI 2000).

Cyanea copelandii ssp. *haleakalaensis* is found on stream banks and wet scree (a sloping mass of rocks at the base of a cliff) slopes in montane wet or mesic forest dominated by *Acacia koa* (koa) and/or *Metrosideros polymorpha* at elevations between 730 and 1,340 m (2,400 and 4,400 ft) (64 FR 48307; HINHP Database 2000). Associated species include *Cibotium* sp., *Perrottetia sandwicensis* (olomea), *Psychotria hawaiiensis* (kopiko ula), *Broussaisia arguta*, and *Hedyotis acuminata* (au) (64 FR 48307; HINHP Database 2000).

The major threats to this species are habitat degradation and/or destruction by feral pigs; competition with several alien plant taxa; rats; slugs; and potential extinction due to random environmental events due to small population sizes (64 FR 48307).

Cyanea glabra

Cyanea glabra, a member of the bellflower family (Campanulaceae), is a short-lived, perennial shrub, with the leaves of juvenile plants deeply pinnately lobed, while those of the adult plants are more or less entire and elliptical. This species is differentiated from others in this endemic Hawaiian genus by the size of the flower and the pinnately lobed juvenile leaves (Lammers 1999).

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

Historically, *Cyanea glabra* has been reported from West Maui and on Haleakala, East Maui (64 FR 48307; HINHP Database 2000). Currently, this species is known from a single population of 12 individual plants on privately owned land in Kaua'ula Valley (GDSI 2000; HINHP Database 2000).

Cyanea glabra is found on soil and rock stream banks in wet lowland forest dominated by *Acacia koa* and/or *Metrosideros polymorpha*, at elevations between 800 to 1,340 m (2,625 to 4,400 ft) (HINHP Database 2000).

The threats to this species are slugs; habitat degradation and/or destruction by feral pigs; flooding; competition with several alien plant taxa; rats; the two-spotted leafhopper (*Saphonia rufofascia*); and extinction caused by random environmental events due to the small number individuals in the only remaining population (64 FR 48307).

Cyanea hamatiflora ssp. *hamatiflora*

Cyanea hamatiflora ssp. *hamatiflora*, a short-lived perennial and member of the bellflower family (Campanulaceae), is a palm-like tree with tan colored latex. This subspecies is differentiated from the listed subspecies (*C. hamatiflora* ssp. *carlsonii*) by its longer calyx lobes and shorter individual flower stalks. This species is separated from others in this endemic Hawaiian genus by fewer flowers per inflorescence and narrower leaves (Lammers 1999).

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

Historically, *Cyanea hamatiflora* ssp. *hamatiflora* was known from the windward side of Haleakala, stretching from Puu o Kakae to Manawainui (HINHP Database 2000). Currently, this taxon is known from nine populations with a total of 22 individuals in Haipuaena Gulch in the Koolau Forest

Reserve; along East Wailuaki Stream in the Koolau Forest Reserve; upper Kipahulu Valley in Haleakala National Park; and between Puu Ahulili and Kaupo Gap (State, Federal, and privately owned lands) (Warshauer 1998; GDSI 2000; HINHP Database 2000).

Typical habitat for this taxon is montane wet forest dominated by *Metrosideros polymorpha*, with a *Cibotium* sp. and/or native shrub understory and closed *Acacia koa*-*M. polymorpha* wet forest from 975 to 1,500 m (3,200 to 4,920 ft) elevation (HINHP Database 2000). Associated native plant taxa include *Dicranopteris linearis*, *Cheirodendron trigynum*, *Broussaisia arguta*, *Cyanea solenocalyx* (haha), *Cyanea kunthiana* (haha), *Vaccinium* sp., *Melicope* sp., and *Myrsine* sp. (kolea) (64 FR 48307; HINHP Database 2000).

The threats to this species are habitat degradation and/or destruction by feral pigs; landslides; competition with the alien plant *Ageratina adenophora* (Maui pamakani); rats; and slugs (64 FR 48307).

Cyanea mceldowneyi

Cyanea mceldowneyi (a member of the bellflower family (Campanulaceae)) is a short-lived, unbranched perennial shrub with rough to prickly stems. This species is distinguished from other species of *Cyanea* by the combination of a densely armed trunk, long (40 mm (1.6 in.)) white-colored corollas, and leaf blade size and shape (Lammers 1999).

There is very little known about the life history of this plant. Reproductive cycles, longevity, specific environmental requirements, and limiting factors are unknown (USFWS 1997).

Historically, *Cyanea mceldowneyi* was known from rainforest west of Waikamoi to Honomanu on northwestern Haleakala (Lammers 1999). Currently, this species is known from six populations with a total of 31 individuals, in the vicinity of Waikamoi Drainage on East Maui, on or near State and privately owned lands (Warshauer 1998; GDSI 2000; HINHP Database 2000).

The habitat of this species is montane wet forest with mixed *Metrosideros polymorpha*-*Acacia koa* at elevations between 925 and 1,280 m (3,030 and 4,200 ft) (Lammers 1999; HINHP Database 2000). Associated native plants include *Melicope clusiifolia* (kolokolo mokihana), *Hedyotis* sp. (NCN), *Clermontia arborescens*, *Diplazium sandwichianum*, *Broussaisia arguta*, *Cibotium* sp., *Cyrtandra* sp. (haiwale), *Dicranopteris linearis*, and *Cheirodendron trigynum* (57 FR 20772).

The threats to this species are habitat degradation and physical destruction by feral pigs; small number of populations and individuals (57 FR 20772); and competition with alien plant species, especially *Setaria palmifolia* (palmgrass) (USFWS 1997).

Dubautia plantaginea ssp. *humilis*

Dubautia plantaginea ssp. *humilis*, a short-lived perennial of the aster family (Asteraceae), is a dwarf shrub less than 80 cm (30 in.) tall with hairless or strigulose (bulbous-based hairs, all pointing in the same direction) stems. This species differs from other Hawaiian members of the genus by the number of nerves in the leaves and by the close resemblance of the leaves to the genus *Plantago* (Carr 1985, 1999b). The subspecies *humilis* differs from the other two subspecies (*D. plantaginea* ssp. *magnifolia* and *Dubautia plantaginea* ssp. *plantaginea*) by having fewer heads per inflorescence, but more florets per head (Carr 1999b).

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

Dubautia plantaginea ssp. *humilis* has only been reported from two locations in Iao Valley, on West Maui. These populations, totaling 60–65 individuals, are on or near State and privately owned lands (GDSI 2000; HINHP Database 2000).

The typical habitat of the species is wet, barren, steep, rocky, wind-blown cliffs between 350 to 400 m (1,150 to 1,300 ft) elevation. Associated native plant taxa include *Metrosideros polymorpha*, *Pipturus albidus* (mamaki), *Eragrostis variabilis* (kawelu), *Carex* sp. (NCN), *Hedyotis formosa* (NCN), *Lysimachia remyi* (kolokolo kuahiwi), *Bidens* sp. (kookoolau), *Pritchardia* sp. (loulou), and *Plantago princeps* (64 FR 48307; HINHP Database 2000).

Threats to *Dubautia plantaginea* ssp. *humilis* include landslides and competition from alien plant taxa (64 FR 48307). Random environmental events, such as landslides, are a threat because of the limited number of individuals and populations and their narrow distribution.

Geranium arboreum

Geranium arboreum, a long-lived perennial and a member of the geranium family (Geraniaceae). It is a many branched, spreading, woody shrub about 1.8 to 3.7 m (6 to 12 ft) tall. This species can be distinguished from other *Geranium* by its red petals with the upper three petals erect and the lower

two reflexed, causing the flower to appear curved (Wagner *et al.* 1999).

Geranium arboreum is the only species in its genus that appears to be adapted to bird-pollination (Funk 1982, 1988). Native honeycreepers appear to be a major pollination vector. *G. arboreum* from the southwest area of Haleakala in the Kula Forest Reserve produce seeds that are larger and fuller than seeds from the northwest extension of its distribution (USFWS 1997). Native honeycreepers are reasonably abundant in both areas (USFWS 1997).

The original range and abundance of the species is unknown, but late 19th and early 20th century collections indicate that it once grew on the southern slopes of Haleakala and that its distribution on the northern slopes extended beyond its presently known range. There are ten populations totaling 142 to 147 individuals, on State, private, and federally owned lands (Warshauer 1998; GDSI 2000; HINHP Database 2000). These populations are found in Waiohuli; west side of Puu Nianiau; west side of Puu Koolau; Waiakoa and Kealahou; Hapapa Gulch; Kaonoulu; southeast and southwest side of Puu Keokea; and Papaanui (Warshauer 1998; HINHP Database 2000).

Geranium arboreum grows in steep, damp, and shaded narrow canyons and gulches, steep banks, and along intermittent streams in *Sophora chrysophylla* (mamane) subalpine dry shrubland and *Metrosideros polymorpha* montane forest, between 1,525 to 2,135 m (5,000 and 7,000 ft) in elevation. Associated native plant species include *Vaccinium reticulatum* (ohelo ai), *Dodonaea viscosa* (aalii), *Styphelia tameiameiae*, *Rubus hawaiiensis*, and *Dryopteris wallichiana* (NCN) (USFWS 1997).

The greatest immediate threat to the survival of this species is the encroachment and competition from naturalized, exotic vegetation, chiefly grasses and trees. Soil disturbance, caused by trampling cattle and rooting by feral pigs, also is a major threat as it destroys plants and facilitates the encroachment of competing species of naturalized plants. Other less important threats include browsing by cattle; fires; and pollen from exotic pine trees, which at times of the year completely cover the stigmas of the geraniums, precluding any fertilization by its own species (Funk 1982, 1988). The small number of individual plants increases the potential for extinction from random environmental events, and the limited gene pool may depress reproductive vigor (57 FR 20580; USFWS 1997).

Geranium multiflorum

Geranium multiflorum, a long-lived member of the geranium family (Geraniaceae). This perennial is a 1 to 3 m (3 to 10 ft) tall, many-branched shrub. Flowers are in clusters of 25 to 50, and have 5 white petals that are 10 to 15 mm (0.4 to 0.6 in.) long with purple veins or bases. This species is distinguished from others of the genus by its white, regularly symmetrical flowers and by the shape and pattern of teeth on its leaf margins (57 FR 20772; Wagner *et al.* 1999).

There is very little known about the life history of this plant. Reproductive cycles, longevity, specific environmental requirements, and limiting factors are unknown (USFWS 1997).

Historically, *Geranium multiflorum* was known from Ukulele, Waieleele, and Waiapanapa on East Maui (HINHP Database 2000). This species is now known from Haleakala National Park, Hanawi NAR, Koolau Forest Reserve, and Waikamoi Preserve on Federal, State, and private lands (Warshauer 1998; GDSI 2000; HINHP Database 2000). The nine known populations extend over a distance of about 10.5 by 5.5 km (6.5 by 3.5 mi). Due to the inaccessibility of the populations and the difficulty in determining the number of individuals (due to the plant's multi-branched form), the total number of individuals of this species is not known; however, it probably does not exceed 3,000 plants (57 FR 20772; HINHP Database 2000).

Geranium multiflorum is found in wet or mesic *Metrosideros polymorpha* montane forest and alpine mesic forest, *Styphelia tameiameiae* shrubland, *Sophora chrysophylla* subalpine dry forest, open sedge swamps, fog-swept lava flows, or montane grasslands, between 1,580 and 2,450 m (5,180 and 8,040 ft) in elevation (Wagner *et al.* 1999; HINHP Database 2000). Associated native species include *Coprosma montana* (pilo), *Dryopteris glabra* (hohui), *Dryopteris wallichiana*, *Rubus hawaiiensis*, *Ranunculus* sp. (makou), *Vaccinium* sp., *Hedyotis* sp., and *Sadleria cyatheoides* (amau) (HINHP Database 2000).

The major threat to *Geranium multiflorum* is competition with encroaching alien plant species, particularly *Rubus argutus* (prickly Florida blackberry) (57 FR 20772). A potential threat is habitat destruction by feral pigs and goats in unfenced areas.

Kanaloa kahoowawensis

Kanaloa kahoowawensis, a short-lived perennial and a member of the legume

family (Fabaceae), is a densely branched shrub 0.75 to 1 m (2.5 to 3.5 ft) tall. The leaves are divided into three pairs of leaflets, with a leaf nectary (nectar-bearing gland) at the joint between each pair of leaflets. One to three inflorescences are found in the leaf axils (joint between leaf and stem), developing with the flush of new leaves. The inflorescence is a globose head with 20 to 54 white flowers. Up to four fruits develop in each flowering head. One slender, brown seed, about 2 mm (0.08 in.) long, is found in each fruit. There is no other species of legume in Hawaii that bears any resemblance to this species or genus (Lorence and Wood 1994).

Additional information on the life history of this plant, reproductive cycles, longevity, specific environmental requirements, and limiting factors is generally unknown (64 FR 48307).

Kanaloa kahoowawensis was unknown to science until its discovery by Steve Perlman and Ken Wood in 1992 on a steep rocky spire on the coast of Kahoolawe. The only known location of *Kanaloa kahoowawensis* is this rocky stack on the southern coast of the island of Kahoolawe, which is owned by the State of Hawaii (Lorence and Wood 1994). While there are no previous records of the plant, pollen core studies on the island of Oahu revealed a legume pollen that could not be identified until this species was discovered. The pollen cores indicate that *K. kahoowawensis* was a codominant with *Dodonaea viscosa* and *Pritchardia* sp. from before 1210 B.C. to 1565 A.D., at which point *K. kahoowawensis* disappeared from the pollen record and *D. viscosa* and *Pritchardia* sp. declined dramatically (Athens *et al.* 1992; Athens and Ward 1993; Lorence and Wood 1994). Only one population with two living individuals is known (Paul Higashino, Kahoolawe Island Reserve Commission (KIRC), pers. comm. 2000).

The only known habitat is mixed coastal shrubland on steep rocky talus slopes at 45 to 60 m (150 to 200 ft) elevation. Associated native plant taxa include *Sida fallax* (ilima), *Senna gaudichaudii* (kolomona), *Bidens mauensis* (kookoolau), *Lipochaeta livarum* (nehe), *Portulaca molokinensis* (ihi), and *Capparis sandwichiana* (maia pilo) (64 FR 48307).

The major threats to *Kanaloa kahoowawensis* are landslides and the alien plant taxa *Emilia fosbergii* (pualele), *Chloris barbata* (swollen finger grass), and *Nicotiana glauca* (tobacco tree) (Lorence and Wood 1994). Goats played a major role in the destruction of vegetation on Kahoolawe

before they were removed (Cuddihy and Stone 1990), and *K. kahoolawensis* probably survived only because the rocky stack is almost completely separated from the island and inaccessible to goats (Lorence and Wood 1994). Rats are a potential threat to *Kanaloa kahoolawensis*, because the species has seeds similar in appearance and presentation to the seeds of the federally endangered *Caesalpinia kavaense* (Uhiuhi), which are eaten by rats. Rats may have been the cause of the decline of this species 800 years ago. Trampling and habitat degradation from cats and seabirds are also potential threats (P. Higashino, pers. comm. 2000). Random environmental events and/or reduced reproductive vigor are also a threat to this species, because only two individuals are known (64 FR 48307).

Lipochaeta kamolensis

Lipochaeta kamolensis, a short-lived perennial herb of the aster family (Asteraceae), has trailing or climbing stems that are woody at the base and reach a length of 0.3 to 3 m (1 to 10 ft). This species is distinguished from others of the genus by the simple leaves which are pinnately lobed or cut and by the size of the flower heads (Wagner *et al.* 1999).

Lipochaeta kamolensis has been observed flowering from December through February, as well as in April. The growing season coincides with the wet season between November and April/May. Plants are dry and appear to be metabolically inactive during the dry season. Additional information on the life history of this plant, reproductive cycles, longevity, specific environmental requirements, and limiting factors is generally unknown (USFWS 1997).

Historically, *Lipochaeta kamolensis* was known from Kamole Gulch, west of Kepuni Gulch, and 7.2 km (11.8 mi) southeast of Ulupalakua Ranch Office (Wagner *et al.* 1999). This species still occurs in the Kamole Gulch, as well as Kepuni Gulch, both above and below Highway 31 on State-owned and private lands. The only known population, which extends over an area of about 40 ha (100 ac), is estimated to contain less than 500 individuals (GDSI 2000, HINHP Database 2000; Kenneth Wood, National Tropical Botanical Garden (NTBG) *in litt.* 1999).

Lipochaeta kamolensis typically grows along the bottom of rock ledges in dry to mesic scrub or dry lowland forests at elevations from 220 to 250 m (720 to 820 ft) (Wagner *et al.* 1999). Associated vegetation includes *Dodonaea viscosa*, *Plumbago zeylanica*

(ilice), and *Ipomoea indica* (koali awa) (K. Wood, *in litt.* 1999).

The major threats to *Lipochaeta kamolensis* are habitat destruction and predation by cattle and goats, competition with alien plants such as *Lantana camara*, fire, and the small number of populations subject to extinction by random environmental events (57 FR 20772; USFWS 1997).

Melicope adscendens

Melicope adscendens, a long-lived perennial of the citrus family (Rutaceae), is a sprawling shrub with long, slender branches covered with gray hairs when young, which become hairless when older. *M. adscendens* is distinguished from other species of the genus by its growth habit, the distinct follicles of its fruit, and the persistent (remaining attached) sepals and petals (Stone *et al.* 1999).

Melicope adscendens fruits have been collected in March and July. Additional information on the life history of this plant, reproductive cycles, longevity, specific environmental requirements, and limiting factors is generally unknown (USFWS 1997).

Melicope adscendens has been found only on the southwestern slope of Haleakala; two plants, separated by an unspecified distance, were found by Forbes in 1920. Today, there are a total of three known populations on State and private lands: one of the original plants persists near Puu Ouli on privately owned land, 26 individuals are known from Auwahi, and one individual has been found in the Kanaio NAR (GDSI 2000, HINHP Database 2000).

This species typically grows at elevations between 770 and 1,220 m (2,520 and 4,000 ft) in *Nestegis sandwicensis* (olopua) lowland mesic forest or open dry forest on a lava flow (a particular type of lava flow with very sharp edges) with pockets of soil. Associated native plant species include: *Pleomele auwahiensis* (hala pepe), *Dodonaea viscosa*, *Osteomeles anthyllidifolia* (ulei), *Alphitonia ponderosa* (kauila), *Chamaesyce celastroides* var. *lorifolia* (akoko), *Santalum ellipticum* (iliahiale e), *Pouteria sandwicensis* (alaa), *Styphelia tameiameiae* and *Xylosma hawaiiensis* (maua) (HINHP Database 2000, K. Wood, *in litt.* 1999).

Major threats are habitat damage and trampling by cattle, competition with alien plant species, including *Lantana camara*, *Bocconia frutescens* (NCN), and *Pennisetum clandestinum*, and reduced reproductive vigor or extinction from random environmental events due to the small number of individuals and narrow

distribution. Potential threats include habitat degradation and damage to plants by axis deer (*Axis axis*), feral goats, feral pigs, black twig borer, fire, and ranch activities (59 FR 62346; USFWS 1997; HINHP Database 2000).

Melicope balloui

Melicope balloui, a long-lived perennial of the citrus family (Rutaceae), is a small tree or shrub. New growth has yellowish brown woolly hairs and waxy scales; plant parts later become nearly hairless. *M. balloui* is distinguished from other species of the genus by the partially fused carpels of its four-lobed capsule and usually persistent sepals and petals (Stone *et al.* 1999).

Additional information on the life history of this plant, reproductive cycles, longevity, specific environmental requirements, and limiting factors is generally unknown (USFWS 1997).

Melicope balloui has been found only on the northern and southeastern slopes of Haleakala. There are two known populations, located approximately 4.0 km (2.5 mi) apart; one near Puu o Kakae on privately owned land and the second on federally owned land in Kipahulu Valley within Haleakala National Park. The two populations are comprised of approximately 50 individuals (GDSI 2000; HINHP Database 2000; K. Wood, *in litt.* 1999).

This species typically grows in *Acacia koa* and *Metrosideros polymorpha* dominated montane wet forest at elevations between 760 and 1,520 m (2,500 and 5,000 ft). Associated taxa include *Machaerina angustifolia* (uki), *Cheirodendron trigynum*, *Labordia hedyosmifolia* (kamakahala), *Coprosma* sp. (pilo), *Dicranopteris linearis*, *Joinvillea ascendens* ssp. *ascendens* (ohe), and *Peperomia subpetiolata* (ala ala wai nui) (HINHP Database 2000, USFWS 2000).

Major threats are habitat degradation and damage to plants by feral pigs and axis deer and reduced reproductive vigor or extinction caused by random environmental events due to the small number of existing populations and individuals. Potential threats include competition with alien plant taxa, such as *Paspalum conjugatum*, *Clidemia hirta*, *Paspalum urvillei*, *Andropogon virginicus* (broomsedge), and *Psidium cattleianum* (strawberry guava); susceptibility to black twig borer; and predation by rats (59 FR 62346; USFWS 1997; HINHP Database 2000).

Melicope ovalis

Melicope ovalis, a long-lived perennial of the citrus family

(Rutaceae), is a tree growing up to 5 m (16 ft) tall. New growth has fine, short, brownish hairs, but soon becomes hairless. Leaves are opposite, leathery, and broadly elliptic. The upper and lower surfaces of the leaves are hairless, and bruised foliage has an anise odor similar to that of *M. anisata*. Each flower cluster is on a main stalk and comprises three to seven flowers on individual stalks. Further details of the flowers are unknown. The fruit, a capsule, has carpels that are fused along almost their entire length. Each fertile carpel contains one or two glossy black seeds. The exocarp and endocarp are both hairless. *M. ovalis* is distinguished from other species of the genus by the almost entirely fused carpels of its capsule, its nonpersistent sepals and petals, and its well-developed petioles (Stone *et al.* 1999).

Additional information on the life history of this plant, reproductive cycles, longevity, specific environmental requirements, and limiting factors is generally unknown (USFWS 1997).

Melicope ovalis has been found only on the eastern and southeastern slopes of Haleakala. There is one known population with less than 300 individuals, found on federally owned land in Kipahulu Valley in Haleakala National Park (GDSI 2000; HINHP Database 2000; K. Wood, *in litt.* 1999).

This species typically grows in *Acacia koa* and *Metrosideros polymorpha*-dominated montane wet forests along streams at elevations between 850 and 1,430 m (2,800 and 4,700 ft). Associated taxa include *Dicranopteris linearis*, *Machaerina angustifolia*, *Labordia hedyosmifolia*, *Wikstroemia oahuensis* (akia), *Dubautia plantaginea*, *Hedyotis hillebrandii*, *Broussaisia arguta*, *Cheirodendron trigynum*, and *Perrottetia sandwicensis* (USFWS 1997; HINHP Database 2000).

Major threats to the only known population are habitat degradation and damage to plants by feral pigs and reduced reproductive vigor and/or extinction due to random environmental events. Competition with introduced plants such as *Paspalum conjugatum*, *Clidemia hirta*, *Rubus rosifolius* (thimbleberry) and *Psidium cattleianum*, seed predation by rats, and susceptibility to black twig borer are also threats to this species (59 FR 62346; USFWS 1997; HINHP 2000; K. Wood *in litt.* 1999). Habitat degradation and damage to plants by feral goats and axis deer are potential threats if the integrity of the fence currently surrounding the population is compromised.

Remya mauiensis

Remya mauiensis is a short-lived perennial member of the aster family (Asteraceae). The genus *Remya* is endemic to the Hawaiian Islands. It is a small perennial shrub, about 90 cm (3 ft) tall, with many slender, sprawling, or scandent to weakly erect branches, covered with a fine tan fuzz near their tips. The leaves are narrow, up to about 15 cm (6 in.) long, and are bunched at the ends of the branches. The coarsely toothed leaf blade is 5 to 12 times longer than wide, has a long-attenuate base, and a petiole of less than 1 cm (0.4 in.) long. The leaves are green on the upper surface and covered with a dense mat of fine white hairs on the lower surface. The flowers are small, about 0.7 cm (0.3 in.) in diameter, dark yellow, and densely clustered at the ends of their stems (Wagner *et al.* 1999).

Additional information on the life history of this plant, reproductive cycles, longevity, specific environmental requirements, and limiting factors is generally unknown (USFWS 1997).

Remya mauiensis was collected twice by William Hillebrand on West Maui between 1851 and 1871, and again in 1920 by Charles Forbes, also on West Maui. It was thought to be extinct until its rediscovery in 1971 by L.E. Bishop, W. Gagne, and S. Montgomery on the slopes of Manawainui Gulch, West Maui. Currently, *R. mauiensis* is known from three small populations on adjacent ridges on State-owned land in West Maui: Manawainui, Papaalua Gulch, and Ukemehame (GDSI 2000). Because of the sprawling habit of this species, and the often dense growth of the surrounding vegetation, it is difficult to determine the exact number of individuals in a population; however, there is an estimate of 26 individuals (HINHP Database 2000).

Remya mauiensis grows chiefly on steep, north or northeast-facing slopes between 850 to 1,250 m (2,800 to 4,100 ft) in elevation, primarily in mixed mesophytic forests, *Metrosideros polymorpha* montane wet forest, or the remnants of such forests. Associated species include: *Diospyros sandwicensis* (lama), *Xylosma hawaiiensis*, *Nestegis sandwicensis*, *Myrsine lessertiana* (kolea lau nui), *Wikstroemia* sp. (akia), *Dodonaea viscosa*, *Diplazium sandwichiense*, *Lysimachia remyi*, *Microlepis strigosa* (palapalai), *Melicope* sp., *Alyxia olivifolia* (maile), *Psychotria mariniana*, *Ctenitis squamigera*, *Pleomele auwahiensis*, and *Styphelia tameiameia* (HINHP Database 2000, USFWS 1997).

This species is threatened by extinction due to random catastrophic environmental events by virtue of the extremely small size of the populations coupled with a limited distribution of the remaining populations. The limited gene pool may depress reproductive vigor, or a single environmental disturbance could destroy a significant percentage of the known individuals. However, the primary threat to this species is the loss and degradation of its habitat due to the introduction of alien plants, such as *Rubus rosifolius* and *Tibouchina herbacea*, and feral pigs (56 FR 1450; USFWS 1997).

Schiedea haleakalensis

Schiedea haleakalensis, a short-lived perennial of the pink family (Caryophyllaceae), is a hairless shrub, with slightly fleshy, narrow leaves and a single vein. Flowers are arranged in clusters at the ends of the branches. The flower has 5 green, oval sepals; no petals; 5 nectaries; and 10 stamens. Capsules contain grayish to reddish brown seeds. This species differs from other species of the genus on East Maui by its crowded, hairless inflorescence composed of bisexual flowers (Wagner *et al.* 1999).

Schiedea haleakalensis is gynodioecious (individuals either have only female flowers or only perfect flowers) and so likely needs cross pollination by small insects. Small, short-flighted flies and moths have been observed visiting flowers. Fruits and seeds have been observed from August through September. Additional information on the life history of this plant, reproductive cycles, longevity, specific environmental requirements, and limiting factors is generally unknown (USFWS 1997).

Due to the lack of early collections or sightings, the historical range of *Schiedea haleakalensis* is unknown. This species is known only from Holua and the west side of Kaupo Gap in the federally owned Haleakala National Park (GDSI 2000; HINHP Database 2000). The two populations are estimated to contain a total of 100 to 200 individuals, which together extend over a total area of 11 ha (28 ac) (HINHP Database 2000).

Schiedea haleakalensis typically grows on sheer, north-facing arid subalpine cliffs at elevations of 1,830 to 2,140 m (6,000 to 7,020 ft) (Wagner *et al.* 1999). Associated vegetation includes *Artemisia mauiensis* (hinahina), *Bidens micrantha* (NCN), *Dubautia* sp., and *Viola chamissoniana* (pamakani) (USFWS 1997; HINHP Database 2000).

The greatest threats to *Schiedea haleakalensis* are fire and other catastrophic events that could severely impact the species due to the small number and restricted distribution of remaining individuals and populations (57 FR 20772; USFWS 1997).

Tetramolopium capillare

Tetramolopium capillare, a short-lived perennial of the sunflower family (Asteraceae), is a sprawling shrub with stems measuring 50 to 80 cm (20 to 31 in.) long and covered with many glands when young. The very firm, stalkless leaves are involute (edges rolled under). Flower heads are situated singly at the ends of stalks. Located beneath each flower head are 45 to 50 bracts, arranged in a structure 3 to 4 mm (about 0.1 in.) high and 7 to 10 mm (0.3 to 0.4 in.) in diameter. In each flower head, 30 to 50 white, male ray florets are surrounded by 15 to 25 greenish yellow tinged with red, functionally female florets. The achenes (dry, one-seeded fruits) are topped by a white pappus comprising a single series of bristles. *T. capillare* differs from other species of the genus by its very firm leaves with edges rolled under, its solitary flower heads, the color of its disk florets, and its shorter pappus. It differs from *T. remyi*, with which it sometimes grows, by its more sprawling habit and the shorter stalks of its smaller flower heads (Lowrey 1999).

Additional information on the life history of this plant, reproductive cycles, longevity, specific environmental requirements, and limiting factors is generally unknown (USFWS 1997).

Historically, *Tetramolopium capillare* is known from Lahainaluna to Wailuku on West Maui (Lowrey 1999). Currently, four known populations with a total of between 130 and 150 individuals are known to be extant near Halepohaku, Koai, and Kauaula on State and privately owned lands (GDSI 2000; USFWS 2000).

Tetramolopium capillare typically grows on rocky substrates at elevations between 610 and 1,050 m (2,000–3,440 ft) in *Metrosideros polymorpha-Styphelia tameiameia* montane mesic or wet shrubland or in *Heteropogon contortus* (pili grass) lowland dry forest. Plant species associated with the higher elevation populations include *Dodonaea viscosa*, *Metrosideros polymorpha*, and *Styphelia tameiameia*. *Dodonaea viscosa*, *Heteropogon contortus*, and *Myoporum sandwicense* (naio) are associates of the other populations (USFWS 1997).

The major threats to *Tetramolopium capillare* are fires; competition from alien plant species, particularly *Lantana*

camara, *Leucaena leucocephala* (koa haole), and *Rhynchelytrum repens* (nataleto); and reduced reproductive vigor and/or extinction from random environmental events due to the small number of existing populations and individuals (59 FR 49860; USFWS 1997).

Multi-Island Species

Alectryon macrococcus

Alectryon macrococcus, a long-lived perennial and a member of the soapberry family (Sapindaceae), consists of two varieties, *macrococcus* and *auwahiensis*, both trees with reddish-brown branches and net-veined paper or leather-like leaves with one to five pairs of sometimes asymmetrical egg-shaped leaflets. The underside of the leaf has dense brown hairs, only when young in *A. macrococcus* var. *macrococcus*, and persistent in *A. macrococcus* var. *auwahiensis*. The only member of its genus found in Hawaii, this species is distinguished from other Hawaiian members of its family by being a tree with a hard fruit 2.5 cm (1 in.) or more in diameter (57 FR 20772; 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 *A. macrococcus*. Flowering cycles, pollination vectors, seed dispersal agents, longevity, and specific environmental requirements are unknown.

Historically and currently, *Alectryon macrococcus* var. *macrococcus* is known from Kauai, Oahu, Molokai, and Maui. On Maui, this taxon is found along the Honokowai Ditch Trail and in Launiupoko Valley, on or near State and privately owned lands (GDSI 2000; HINHP Database 2000). There are three populations with a total of four individuals (HINHP Database 2000). Currently, *A. macrococcus* var. *auwahiensis* is known from three populations with 22 individuals on leeward East Maui in the Auwahi and Kanaio districts, and on the slopes of Haleakala on private land and State-owned, but privately leased, ranchland (Medeiros *et al.* 1986; GDSI 2000; HINHP Database 2000).

The habitat of *Alectryon macrococcus* var. *macrococcus* is dry slopes or in gulches in dense mesic mixed *Metrosideros polymorpha* forest or *Diospyros sandwicensis* forest at elevations of 360–1,070 m (1,180–3,510 ft) (HINHP Database 2000). Associated native plants include *Nestegis sandwicensis* and *Antidesma platyphyllum* (hame). The habitat of *A.*

macrococcus var. *auwahiensis* is mixed lowland dry forest at elevations of 360–1,070 m (1,180–3,510 ft). Associated native plants include *Diospyros sandwicensis*, *Dodonaea viscosa*, *Osteomeles anthyllidifolia*, *Alphitonia ponderosa*, *Santalum ellipticum*, *Xylosma hawaiiensis*, *Nestegis sandwicensis*, *Streblus pendulinus* (aiai), and *Pleomele auwahiensis* (HINHP Database 2000; K. Wood, *in litt.* 1999).

The threats to *Alectryon macrococcus* var. *macrococcus* on Maui include feral goats and pigs; alien plant species, such as *Melinis minutiflora* (molasses grass), *Pennisetum clandestinum* (kikuyu grass), *Schinus terebinthifolius* (Christmasberry), and *Psidium cattleianum*; damage from the black twig borer; seed predation by rats and mice (*Mus musculus*); fire; seed predation by insects (probably the endemic microlepidopteran *Prays* cf. *fulvocanella*); 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. The threats to *A. macrococcus* var. *auwahiensis* on Maui are damage from the black twig borer; seed predation by rats and mice; habitat degradation by feral pigs and escaped cattle; seed predation by insects (probably *Prays* cf. *fulvocanella*); 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 (57 FR 20772).

Bidens micrantha ssp. *kalealaha*

Bidens micrantha ssp. *kalealaha*, a short-lived member of the aster family (Asteraceae), is an erect perennial herb. This subspecies can be distinguished from other subspecies by the shape of the seeds, the density of the flower clusters, the numbers of ray and disk florets per head, differences in leaf surfaces, and other characteristics (57 FR 20772; Ganders and Nagata 1999).

Bidens micrantha is known to hybridize with other native *Bidens*, such as *B. mauiensis* and *B. menziesii*, and possibly *B. conjuncta* (Ganders and Nagata 1999). Little else is known about the life history of *Bidens micrantha* ssp. *kalealaha*. Flowering cycles, pollination vectors, seed dispersal agents, longevity, and specific environmental requirements are unknown.

Historically, *Bidens micrantha* ssp. *kalealaha* was known from Lanai, the south slope of Haleakala on East Maui,

and from one locality on West Maui (Ganders and Nagata 1999; HINHP Database 2000). Currently, this taxon remains only on East Maui in Kahua, Manawainui to Wailaulau, and in Haleakala National Park, on State and Federal lands. There are a total of four populations with less than 2,000 individuals altogether (USFWS 1999; GDSI 2000; HINHP Database 2000).

The habitat of *Bidens micrantha* ssp. *kalealaha* is blocky lava flows with little or no soil development, deep pit craters, and sheer rock walls in open canopy *Metrosideros polymorpha*-*Acacia koa* forest, montane shrubland, or cliff faces at elevations of 1,600 to 2,300 m (5,250 to 7,550 ft) (Ganders and Nagata 1999; HINHP Database 2000). Associated native species include *Styphelia tameiameia*, *Coprosma montana*, *Dodonaea viscosa*, *Lysimachia remyi*, *Viola chamissoniana*, *Dubautia menziesii*, and *Dubautia platyphylla* (na ena e) (Ganders and Nagata 1999; HINHP Database 2000).

The threats to this species on Maui are habitat destruction by feral goats, pigs, and cattle; competition from a variety of invasive plant species; and fire (57 FR 20772).

Bonamia menziesii

Bonamia menziesii, a short-lived perennial member of the morning-glory family (Convolvulaceae), is a vine with twining branches that are fuzzy when young. This species is the only member of the genus that is endemic to the Hawaiian Islands and differs from other genera in the family by its two styles, longer stems and petioles, and rounder leaves (Austin 1999).

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

Historically, *Bonamia menziesii* was known from Kauai, Oahu, Molokai, one location on West Maui, and the island of Hawaii (HINHP Database 2000). Currently, this species is known from Kauai, Oahu, Lanai, Maui, and Hawaii. On Maui, this species is known from Puu o kali; Honokowai Ditch Trail; and Kanaio NAR. Currently there are three populations containing a total of 11 individuals on State and privately owned lands (GDSI 2000; HINHP Database 2000; K. Wood, *in litt.* 1999).

Bonamia menziesii is found on a'a lava in mixed open dry forest, or *Erythrina sandwicensis* (wiliwili) lowland dry forest, and in mesic mixed *Metrosideros polymorpha* forest at elevations between 150 and 850 m (490 and 2,800 ft) (HINHP database 1999; K. Wood, *in litt.* 1999). Associated species

include *Nestegis sandwicensis*, *Pleomele auwahiensis*, *Dodonaea viscosa*, *Osteomeles anthyllidifolia*, *Alphitonia ponderosa*, *Santalum ellipticum*, *Xylosma hawaiiensis*, *Nothoctrum latifolium* (aiea), *Pouteria sandwicensis*, *Achyranthes splendens* (NCN), *Acacia koaia* (koaia), *Sida fallax*, *Reynoldsia sandwicensis* (ohe), *Sicyos* sp. (anunu), *Lipochaeta rockii* (nehe), *Nototrichium* sp. (kului), *Myoporum sandwicense* (HINHP Database 2000; K. Wood, *in litt.* 1999).

The primary threats to this species on Maui are habitat degradation and possible predation by feral pigs, goats, axis deer, and cattle; competition with a variety of alien plant species, particularly *Pennisetum setaceum*, *Lantana camara*, and *Bocconia frutescens*; and an alien beetle (*Physomerus grossipes*) (59 FR 56333).

Cenchrus agrimonioides

Cenchrus agrimonioides is a short-lived perennial member of the grass family (Poaceae) with leaf blades which are flat or folded and have a prominent midrib. There are two varieties, *C. agrimonioides* var. *laysanensis* and *C. agrimonioides* var. *agrimonioides*. They differ from each other in that var. *agrimonioides* has smaller burs, shorter stems, and narrower leaves. 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'Connor 1999).

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

Historically, *Cenchrus agrimonioides* var. *agrimonioides* was known from the Oahu, Lanai, and the south slope of Haleakala and Ulupalakua on Maui, and an undocumented report from the Island of Hawaii (61 FR 53108). Historically, *C. agrimonioides* var. *laysanensis* was known from Laysan, Kure, and Midway, all within the Northwestern Hawaiian Islands National Wildlife Refuge. This variety has not been seen since 1973 (61 FR 53108; Corn 1980). Currently, *Cenchrus agrimonioides* var. *agrimonioides* is known from Oahu and Maui. On Maui, this variety is known from a single population within the Kanaio NAR, containing an unknown number of individuals (HINHP Database 2000).

Cenchrus agrimonioides var. *agrimonioides* is found on rough a'a lava scree in mesic *Metrosideros polymorpha*-*Acacia koa* forest at elevations between 560 and 820 m

(1,830 and 2,700 ft). Associated plants include *Alyxia oliviformis*, *Canthium odoratum* (alahee), *Carex* sp., *Diospyros* sp. (lama), *Styphelia tameiameia*, and *Eragrostis variabilis* (61 FR 53108; HINHP Database 2000).

The major threats to the only known population of *Cenchrus agrimonioides* var. *agrimonioides* on Maui are competition with alien plants; browsing and habitat degradation by goats and cattle; and a risk of extinction from naturally occurring events and/or reduced reproductive vigor due to the small number of existing individuals (61 FR 53108).

Centaurium sebaeoides

Centaurium sebaeoides is an annual herb in the gentian family (Gentianaceae), with fleshy leaves and stalkless flowers. This species is distinguished from *C. erythraea*, which is naturalized in Hawaii, by its fleshy leaves and the unbranched arrangement of the flower cluster (56 FR 55770; 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 (USFWS 1995c). Other than that, little is known about the life history of this plant. Reproductive cycles, longevity, specific environmental regulations, and limiting factors are generally unknown.

Historically and currently, *Centaurium sebaeoides* is known from Kauai, Oahu, Molokai, Lanai, and Maui (Wagner *et al.* 1999). On Maui, there are three populations of this species, with a total of more than 50 individuals, on or near State and privately owned lands, north of Waihee; Puu Koaie; and near the mouth of Makamakaole Stream (HINHP Database 2000).

This species typically grows in volcanic or clay soils or on cliffs in arid coastal areas below 250 m (820 ft) elevation (56 FR 55770; Wagner *et al.* 1999). Associated species include *Panicum torridum* (kakonakona), *Lysimachia mauritiana* (kolokolo kuahiwi), *Schiedea globosa* (NCN), *Lipochaeta integrifolia* (nehe), *Argemone glauca* (pua kala), *Bidens mauiensis*, *Lycium sandwicense* (ohelo kai), and *Dicranopteris linearis* (HINHP Database 2000).

The major threats to this species on Maui 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).

Clermontia lindseyana

Clermontia lindseyana, a short-lived perennial and a member of the bellflower family (Campanulaceae), is a small, branched tree that grows 2.5–6 m (8.2 to 20 ft) tall (Lammers 1999).

Clermontia lindseyana is either terrestrial or epiphytic, living on the surface of other plants. The upper surface of the oblong-shaped leaves is dark green while the lower is pale green or purplish and hairy. Leaf stalks are 2.5–7 cm (1–2.8 in.) long and hairy. Berries are 2.5–4 cm (1–1.6 in.) wide, almost round, and orange. *Clermontia lindseyana* is easily separable from the other taxa within this genus by several characters: much larger leaves and flowers, similar petals and sepals, and spreading floral lobes (Cuddihy *et al.* 1983; Lammers 1999). Rock (1962) commented on the leaves being conspicuously hairy beneath.

This species was observed in fruit from June to October, and in flower from February to August (HINHP Database 2000). No other life history information is currently available.

Historically, *Clermontia lindseyana* was known on Maui from the southern slope of Haleakala and the eastern portion of the island, and on the island of Hawaii. Since 1975, populations of *Clermontia lindseyana* have been identified on Maui and Hawaii (59 FR 10305). The two Maui populations are located in Waiopai and Wailaulau Gulches in the Kahikinui Forest Reserve and in Kula Forest Reserve on State and private lands, and are estimated to total about 330 individuals (Arthur Medeiros, U.S. Geological Survey, Biological Resources Division, *in litt.* 2000; HINHP Database 2000; GDSI 2000).

The extant populations grow in remnant *Acacia koa* mesic forest on the leeward slopes between 1,311 and 2,150 m (4,300 and 7,041 ft). Associated native taxa include the following native plant species: *Cyrtandra oxybapha*, native fern species, *Phlegmariurus mannii*, *Ilex anomala* (aiea), *Coprosma* sp., and *Myrsine* sp. (HINHP Database 2000; USFWS 1996).

The threats to *Clermontia lindseyana* are trampling and grazing by cattle, trampling and browsing by goats, and rooting and trampling by pigs; competition with the alien plant *Pennisetum clandestinum*; and consumption of berries, flowers, and vegetation by black rats (59 FR 10305).

Clermontia oblongifolia ssp. *mauiensis*

Clermontia oblongifolia ssp. *mauiensis*, a short-lived perennial and a member of the bellflower family (Campanulaceae), is a shrub or tree with

oblong to lance-shaped leaves on leaf stalks (petioles). *Clermontia oblongifolia* is distinguished from other members of the genus by its calyx and corolla, which are similar in color and are each fused into a curved tube that falls off as the flower ages. The species is also distinguished by the leaf shape, the male floral parts, the shape of the flower buds, and the lengths of the leaf and flower stalks, the flower, and the smooth green basal portion of the flower (the hypanthium) (57 FR 20772; Lammers 1988, 1999). *Clermontia oblongifolia* ssp. *mauiensis* is reported from Maui and Lanai, while ssp. *oblongifolia* is only known from Oahu and ssp. *brevipes* is only known from Molokai.

Clermontia oblongifolia ssp. *mauiensis* is known to flower from November to July (Rock 1919). Little is known regarding pollination vectors, seed dispersal, or other factors.

Historically, *Clermontia oblongifolia* ssp. *mauiensis* was known from Lanai and from Honomanu Valley on Haleakala, East Maui (57 FR 20772; Lammers 1999). Currently, it is reported from Lanai and Maui. On West Maui, this taxon is known from one population with an unknown number of individuals, along the trail to Puu Kukui in the Honokowai section of the West Maui NAR on or near State and privately owned lands (GDSI 2000; HINHP Database 2000; Lammers 1999).

This plant typically grows on the sides of ridges in *Metrosideros polymorpha*-dominated montane wet forest at elevations between 850–1,000 m (2,800–3,280 ft) (57 FR 20772; HINHP Database 2000). Associated native species include *Dicranopteris linearis*, *Coprosma* sp., *Clermontia* sp., *Hedyotis* sp., and *Melicope* sp. (57 FR 20772; HINHP Database 2000).

The only known population of this species on Maui is vulnerable to extinction from a natural or human-caused environmental disturbance due to its small size; depressed reproductive vigor; and habitat degradation by feral pigs (57 FR 20772; USFWS 1997).

Colubrina oppositifolia

Colubrina oppositifolia, a member of the buckthorn family (Rhamnaceae), is a long-lived tree with extremely hard red wood. This species is readily distinguished from the other species in Hawaii by the opposite leaf position, dull leaf surface, and entire leaf margins (Wagner *et al.* 1999).

This species was observed in fruit and flower during September 1929 and June 1968, and in flower during December 1947 and January 1984 (HINHP

Database 2000). No other life history information is currently available.

Historically and currently, *Colubrina oppositifolia* is known from Oahu, Maui, and the Island of Hawaii (59 FR 10305). Currently on Maui, there are two populations containing one individual each on privately owned lands in the Kapunakea Preserve on West Maui and on privately owned lands in the Auwahi area of East Maui (Warshauer 1998; GDSI 2000; HINHP Database 2000).

Habitats of this species are lowland dry and mesic forests dominated by *Diospyros sandwicensis*, and found at elevations between 240 and 915 m (800 and 3,000 ft). Associated native species include *Dodonaea viscosa*, *Canavalia* sp. (awikiwiki), *Wikstroemia* sp., *Canthium odoratum*, and *Reynoldsia sandwicensis* (HINHP Database 2000).

The threats to this species on Maui are habitat destruction by feral pigs; competition with the alien plants *Lantana camara*, *Pennisetum setaceum*, and *Schinus terebinthifolius*; black twig borer; Chinese rose beetles (*Adoretus sinicus*); fire; and its small population numbers and limited distribution (59 FR 10305; USFWS 1996).

Ctenitis squamigera

Ctenitis squamigera is a short-lived perennial of the wood fern family (Dryopteridaceae) (Wagner and Wagner 1992). It has a rhizome (horizontal stem) 5 to 10 mm (0.2 to 0.4 in.) thick, creeping above the ground and densely covered with scales similar to those on the lower part of the leaf stalk. The leaf stalks are densely clothed with tan-colored scales up to 1.8 cm (0.7 in.) long and 1 mm (0.04 in.) wide. The sori are tan-colored when mature and are in a single row one-third of the distance from the margin to the midrib of the ultimate segments (Degener and Degener 1957). The indusium is whitish before wrinkling, thin, suborbicular with a narra sinus extending about half way, glabrous except for a circular margin which is ciliolate with simple several-celled glandular and nonglandular hairs arising directly from the margin or from the deltoid base (Degener and Degener 1957). *Ctenitis squamigera* can be readily distinguished from other Hawaiian species of *Ctenitis* by the dense covering of tan-colored scales on its frond (Wagner and Wagner 1992).

Reproductive cycles, longevity, specific environmental requirements and limiting factors are unknown.

Historically, *Ctenitis squamigera* was recorded from the islands of Kauai, Oahu, Molokai, Lanai, Maui, and Hawaii (HINHP Database 2000). It is currently found on Oahu, Lanai,

Molokai, and Maui. There are currently six populations with between 52 and 58 individuals on State and privately owned lands on the island of Maui (GDSI 2000; Hank Oppenheimer, Maui Pineapple Co., *in litt.* 2000; K. Wood, pers. comm. 2000; Joel Lau, HINHP, pers. comm. 2000 and *in litt.* 2000). These populations are all on West Maui, in Honolua Valley; Kahanaikei Gulch; Kanaha Valley; Ukumehame Valley; Kapunakea Preserve; and Iao Valley (H. Oppenheimer, *in litt.* 2000; K. Wood and J. Lau, pers. comm. 2000).

This species is found in the forest understory at elevations of 380 to 1,000 m (1,250 to 3,280 ft) (HINHP Database 2000; H. Oppenheimer, pers. comm. 2000), in *Metrosideros polymorpha* montane wet forest, *Metrosideros polymorpha-Diospyros* sp. mesic forest and diverse mesic forest (HINHP Database 2000). Associated native plant taxa include *Alyxia oliviformis*, *Freycinetia arborea* (ieie), *Coprosma* sp., *Pleomele* sp. (hala pepe), *Thelypteris globulifera* (NCN), *Sadleria* sp. (amau), *Doodia* sp. (okupukupu lauui), *Pittosporum* sp. (ho awa), *Dryopteris* sp., *Bobeia* sp. (ahakea), *Antidesma* sp. (hame), *Peperomia* sp., *Dicranopteris linearis*, *Schiedea pubescens* var. *pubescens*, *Hibiscus kokio* ssp. *kokio* (kokio), *Hedyotis formosa*, *Pritchardia forbesiana* (loulou), *Myrsine* sp., *Psychotria* sp. (kopiko), and *Xylosma* sp. (maua) (USFWS 1998a; HINHP Database 2000).

The primary threats to *Ctenitis squamigera* are habitat degradation by feral pigs, goats, and axis deer; competition with alien plant taxa, especially *Psidium cattleianum* and *Schinus terebinthifolius*; fire; and extinction from naturally occurring events due to the small number of existing populations and individuals (USFWS 1998a).

Cyanea grimesiana ssp. *grimesiana*

Cyanea grimesiana ssp. *grimesiana*, a short-lived member of the bellflower family (Campanulaceae), is a perennial 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 this plant. On Molokai, flowering plants have been reported in July and August. Reproductive cycles, longevity, specific environmental requirements, and limiting factors are unknown.

Historically and currently, *Cyanea grimesiana* ssp. *grimesiana* is known from Oahu, Molokai, Lanai, and scattered locations on Maui (61 FR 53108). Currently on Maui, there are two populations with a total of five individuals in Iao Valley on State and privately owned lands (61 FR 53108; GDSI 2000; HINHP Database 2000).

This species is typically found in mesic forest often dominated by *Metrosideros polymorpha* or *Metrosideros polymorpha* and *Acacia koa*, on rocky or steep slopes of stream banks, at elevations between 350 and 945 m (1,150 and 3,100 ft). Associated plants include *Antidesma* sp., *Bobeia* sp., *Myrsine* sp., *Nestegis sandwicensis*, *Psychotria* sp., and *Xylosma* sp. (61 FR 53108).

The threats to this species on Maui are habitat degradation and/or destruction caused by axis deer, goats, and pigs; competition with various alien plants; randomly naturally occurring events that could cause extinction due to the small number of existing individuals; trampling by hikers; landslides; rats; and slugs (61 FR 53108; USFWS 1999).

Cyanea lobata

Cyanea lobata, a short-lived member of the bellflower family (Campanulaceae), is a sparingly branched perennial shrub with smooth to somewhat rough stems and oblong, irregularly lobed leaves. This species is distinguished from other species of *Cyanea* by the size of the flower and the irregularly lobed leaves with petioles (Lammers 1999).

Cyanea lobata is known to flower from August to February, even in individuals as small as 50 cm (20 in.) in height (Rock 1919, Degener 1936).

Historically, *Cyanea lobata* was known from Lanai and West Maui (Lammers 1999; HINHP Database 2000). It is no longer extant on Lanai, and was rediscovered at 600 m (1,970 ft) elevation on privately owned land in Waikapu Valley on West Maui in 1982 (HINHP Database 2000). The single known plant of this species was later destroyed by a landslide triggered by heavy rains (Hobdy *et al.* 1990; HINHP Database 2000). Another population of three individuals was discovered in 1996 at 560 m (1,840 ft) elevation on privately owned land in Honokohau Valley on West Maui (GDSI 2000; HINHP Database 2000).

This species has been seen and collected on steep stream banks in deep shade in wet forest at elevations of 550–915 m (1,800–3,000 ft) with *Touchardia latifolia* (olona), *Morinda trimera* (noni), and *Athyrium* sp. (akolea) (57 FR

20772; Lammers 1999; HINHP Database 2000).

The threats to this species on Maui are habitat degradation by feral pigs; depressed reproductive vigor; and natural or human-caused environmental disturbance that could easily be catastrophic to the only known population due to the small number of remaining individuals and the limited and scattered distribution of the species (57 FR 20772; USFWS 1997).

Cyrtandra munroi

Cyrtandra munroi, a short-lived perennial and member of the African violet family (Gesneriaceae), is a shrub with opposite, elliptic to almost circular leaves which are sparsely to moderately hairy on the upper surface and covered with velvety, rust-colored hairs underneath. This species is distinguished from other species of the genus by the broad opposite leaves, the length of the flower cluster stalks, the size of the flowers, and the amount of hair on various parts of the plant (Wagner *et al.* 1999).

Some work has been done on the reproductive biology of some species of *Cyrtandra* (USFWS 1995b), but not on that of *C. munroi* specifically. The pollinators of these plants have not been identified, although studies indicate that a specific pollinator may be necessary for successful pollination. Seed dispersal may be carried out by birds which eat the fruits (USFWS 1995b). Flowering time, longevity of plants and seeds, specific environmental requirements, and other limiting factors are unknown.

Historically and currently, *Cyrtandra munroi* is known from Lanai and West Maui (Wagner *et al.* 1999; HINHP Database 2000). Currently on Maui, there is a single population in Kahana Valley containing more than 30 individuals on State and privately owned lands (GDSI 2000; HINHP Database 2000).

The habitat of this species is lowland wet *Metrosideros polymorpha-Dicranopteris linearis* forest, typically on rich, moist to wet, moderately steep talus slopes from 300 to 920 m (980–3,020 ft). It occurs on soil and rock substrates on slopes from watercourses in gulch bottoms and up the sides of gulch slopes to near ridgetops. Associated native species include *Diospyros* sp., *Hedyotis acuminata*, *Clermontia* sp., *Alyxia oliviformis*, *Bobeia* sp., *Coprosma* sp., *Freycinetia arborea*, *Melicope* sp., *Myrsine* sp., *Perrottetia sandwicensis*, *Pipturus* sp. (mamaki), *Pittosporum* sp., *Pleomele* sp., *Pouteria sandwicensis*, *Psychotria* sp., *Sadleria* sp., *Scaevola* sp.

(naupaka), *Xylosma* sp., and other *Cyrtandra* sp. (57 FR 20772; HINHP Database 2000).

The threats to this species on Maui are from browsing and habitat disturbance by axis deer; competition with the alien plant species *Psidium cattleianum*, *Myrica faya* (firetree), *Leptospermum scoparium* (tea tree), *Pluchea symphytifolia* (sourbush), *Melinis minutiflora*, *Rubus rosifolius*, and *Paspalum conjugatum* (Hilo grass); loss of appropriate pollinators; a very small number of extant individuals which can cause depressed reproductive vigor; and the effects of random environmental events that could easily be catastrophic to the only known population on Maui (57 FR 20772; USFWS 1995b).

Diellia erecta

Diellia erecta, a short-lived perennial fern in the spleenwort family (Aspleniaceae), grows in tufts of 3 to 9 lance-shaped fronds emerging 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 along both margins, shiny black midribs that have a hardened surface, and veins that do not usually encircle the sori (Smith 1934; Degener and Greenwell 1950; Wagner 1952).

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

Historically, *Diellia erecta* was known on Kauai, Oahu, Molokai, Lanai, scattered locations on Maui, and various locations on the Island of Hawaii (USFWS 1999). Currently, it is only known from Molokai, Maui, and Hawaii. On Maui, there are four known populations containing 23 individual plants on or near State or privately owned lands in Iao Valley, Manawainui Plant Sanctuary, Papalaua Gulch, and Waiopai Gulch (GDSI 2000; HINHP Database 2000).

This species is found in deep shade on steep slopes or gulch bottoms in *Diospyros sandwicensis*-*Metrosideros polymorpha* lowland mesic forest at elevations between 210 and 1,590 m (700 and 5,200 ft) (HINHP Database 2000; USFWS 1999). Associated native plant species include *Nestegis* sp., *Styphelia tameiameia*, *Melicope* sp., *Coprosma* sp., *Dodonaea viscosa*, *Dryopteris unidentata* (NCN), *Myrsine* sp., *Psychotria* sp., *Pleomele auwahiensis*, *Syzygium sandwicensis* (ohia ha), and *Wikstroemia* sp. (HINHP Database 2000; USFWS 1999).

The major threats to *Diellia erecta* on Maui are habitat degradation by pigs, goats, and cattle; competition with alien plant species, including *Blechnum occidentale* (NCN); and random naturally occurring events that could cause extinction and/or reduced reproductive vigor due to the small number of existing individuals (59 FR 56333; USFWS 1996).

Diplazium molokaiense

Diplazium molokaiense, a short-lived perennial member of the woodfern family (Dryopteridaceae), has a short prostrate rhizome and green or straw-colored leaf stalks with thin-textured fronds. This species can be distinguished from other species of *Diplazium* in the Hawaiian Islands by a combination of characteristics, including venation pattern, the length and arrangement of the sori, frond shape, and the degree of dissection of the frond (Wagner and Wagner 1992).

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

Historically, *Diplazium molokaiense* was found on Kauai, Oahu, Molokai, Lanai, and Ainahou Valley and Maliko Gulch (East Maui) and Wailuku (Iao) Valley and Waikapu (West Maui) on Maui (HINHP Database 2000). Currently, this species is only known from Maui. Two populations with one individual each are found in Waiopai Gulch and Makawao Forest Reserve, on or near State or privately owned lands (Warshauer 1998; GDSI 2000; HINHP Database 2000).

This species occurs near water falls in lowland or montane mesic *Metrosideros polymorpha*-*Acacia koa* forest between 850 and 1,680 m (2,800 and 5,500 ft) in elevation (USFWS 1998a; HINHP Database 2000).

The primary threats on Maui are habitat degradation by feral goats, cattle, pigs, and axis deer; competition with alien plant taxa; decreased reproductive vigor; and extinction from randomly occurring natural events due to the small number of populations and individuals (59 FR 49025; USFWS 1998a; HINHP Database 2000).

Flueggea neowawraea

Flueggea neowawraea, a long-lived perennial and a member of the spurge family (Euphorbiaceae), is a large tree with white oblong pores covering its scaly, pale brown bark. 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 (Linney 1982; 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 (Hayden 1999). Little else is known about the life history of this species. Reproductive cycles, longevity, specific environmental requirements, and limiting factors are unknown.

Historically, *Flueggea neowawraea* was known from the islands of Molokai, Oahu, Kauai, and Hawaii (HINHP Database 2000). Currently, populations are known from Kauai, Oahu, East Maui, and Hawaii. It is now known from two populations with a total of three trees on East Maui at Auwahi, and above the Lualailua Hills on the southwest slope of Haleakala, on State and privately owned lands (GDSI 2000; HINHP Database 2000; Mahealani Kaiaokamelie, (formerly with) Ulupalakua Ranch, *in litt.* 2000).

Flueggea neowawraea occurs in dry or mesic forest at elevations of 250 to 1,000 m (820 to 3,280 ft) (Hayden 1999). Associated native plant species include *Alectryon macrococcus*, *Bobea timonioides* (ahakea), *Charpentiera* sp. (papala), *Hibiscus* sp. (aloalo), *Melicope* sp., *Myrsine lanaiensis* (kolea), *Tetraplasandra* sp. (ohe ohe), *Psychotria mariniana* (kopiko), *Diplazium sandwichianum*, *Freycinetia arborea*, *Nesoluma polynesianum* (keahi), *Diospyros* sp., *Antidesma pulvinatum* (hame), *A. platyphyllum*, *Canthium odoratum*, *Nestegis sandwicensis*, *Rauvolfia sandwicensis* (hao), *Pittosporum* sp., *Pleomele* sp., *Pouteria sandwicensis*, and *Streblus pendulinus* (HINHP Database 2000).

The threats to the populations on Maui are the black twig borer; habitat degradation by feral pigs, goats, deer, and cattle; competition with alien plant species; depressed reproductive vigor; the risk of extinction from a random environmental event due to the small number of individuals; and predation of the fruit by rats (59 FR 56333; USFWS 1999; HINHP Database 2000).

Hedyotis coriacea

Hedyotis coriacea, a member of the coffee family (Rubiaceae), is a small, short-lived perennial 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 this plant. Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown.

Historically, *Hedyotis coriacea* was known from Oahu and the Island of Hawaii (HINHP Database 2000). Considered extinct on all islands in recent years, this species was rediscovered in 1990 by Steve Perlman in the State-owned Lihau section of the West Maui NAR and in 1991 on the 1859 lava flow in the Pohakuloa Training Area, Island of Hawaii (HINHP Database 2000; USFWS 1997). Currently, only a single individual is known from West Maui on State-owned land (GDSI 2000; HINHP Database 2000).

Hedyotis coriacea is found on steep, rocky, slopes in dry lowland *Dodonaea viscosa* dominated shrublands at elevations between 470 to 2,300 m (1,540 to 7,550 ft) (HINHP Database 2000). Associated species include *Sida fallax*, *Gouania hillebrandii* (NCN), *Bidens menziesii*, *Lipochaeta livarum*, *Myoporum* sp. (naio), and *Schiedea menziesii* (NCN) (HINHP Database 2000).

The single remaining individual of *Hedyotis coriacea* on Maui is threatened by extinction from a random naturally occurring event.

Hedyotis mannii

Hedyotis mannii, a member of the coffee family (Rubiaceae), is a short-lived perennial plant with smooth, usually erect stems 30 to 60 cm (1 to 2 ft) long, which are woody at the base and four-angled or winged. The leaves are opposite, thin in texture, and elliptic to sometimes lance-shaped. Stipules (leaf-like appendages), which are attached to the slightly winged leaf stalks where they join and clasp the stem, are triangular. Flowers are arranged in loose clusters up to 30 cm (1 ft) long at the ends of the stems and are either bisexual or female. This species' growth habit, its quadrangular or winged stems, the shape, size, and texture of its leaves, and its dry capsule, which opens when mature, separate it from other species of the genus (Wagner *et al.* 1999).

Currently, no life history information is available for this species (USFWS 1996).

Currently and historically, *Hedyotis mannii* is known from Lanai, West Maui, and Molokai (USFWS 1992). On Maui, there is a single population of

approximately 20 individuals located on private land in Kauaala Valley (GDSI 2000; K. Wood *in litt.* 2000).

The population on Maui is found on basalt cliffs along stream banks in *Metrosideros polymorpha-Dicranopteris linearis* montane wet forest between 825 and 885 m (2,700 and 2,900 ft) (K. Wood *in litt.* 2000). Associated plant species include *Machaerina* sp. (uki), *Carex meyenii* (NCN), *Phyllostegia* sp. (NCN), *Hedyotis acuminata*, *Cyrtandra platyphylla* (haiwale), *Cyanea* sp. (haha), and *Isachne distichophylla* (ohe) (K. Wood *in litt.* 2000).

Hedyotis mannii on Maui is threatened by landslides; competition with the alien plant species *Rubus rosifolius*, *Ageratina adenophora*, *Buddleia asiatica* (butterfly bush), *Pluchea carolinensis* (sourbush), and *Clidemia hirta*; and the low number of individuals makes it extremely vulnerable to extinction by random naturally occurring events (USFWS 1996; K. Wood *in litt.* 2000).

Hesperomannia arborescens

Hesperomannia arborescens, a long-lived perennial 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 characteristics: 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 1993 and June 1997 (USFWS 1998). No other information is available on reproductive cycles, longevity, specific environmental requirements, and limiting factors.

Hesperomannia arborescens was formerly known from Lanai, Molokai, and Oahu (HINHP Database 2000). This species is now known from Oahu, Molokai, and Maui. There is currently one population with four individuals on East Maui, between Lanilili and Keahikauo on State and privately-owned lands (GDSI 2000; HINHP Database 2000).

Hesperomannia arborescens is found on slopes or ridges in lowland mesic or wet forest between 360 and 750 m (1,180 and 2,460 ft) in elevation, in association with *Metrosideros polymorpha*, *Myrsine sandwicensis* (kolea), *Isachne distichophylla*, *Pipturus* sp., *Antidesma* sp., *Psychotria* sp., *Clermontia* sp., *Cibotium* sp., *Dicranopteris linearis*, *Bobea* sp., *Coprosma* sp., *Sadleria* sp., *Melicope* sp., *Machaerina* sp., *Cheirodendron* sp.,

and *Freycinetia arborea* (HINHP Database 2000).

The major threats to *Hesperomannia arborescens* on Maui are habitat degradation by feral pigs and goats; competition with alien plant taxa; extinction due to random environmental events or reduced reproductive vigor due to the small number of individuals in one remaining population; and impact by humans (59 FR 14482; HINHP Database 2000).

Hesperomannia arbuscula

Hesperomannia arbuscula, a long-lived perennial 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 six weeks and trees last about 10 to 15 years (USFWS 1995c). No other information is available on reproductive cycles, longevity, specific environmental requirements, and limiting factors.

Historically and currently, *Hesperomannia arbuscula* is known from Oahu and West Maui (HINHP Database 2000). On Maui, this species is found in three populations, containing 13 individuals, on privately owned land in Iao and Waihee Valleys (GDSI 2000; HINHP Database 2000; K. Wood, *in litt.* 1999).

Hesperomannia arbuscula typically grows on slopes and ridges in mesic or wet forest dominated by *Acacia koa* and *Metrosideros polymorpha* at elevations of 350 to 900 m (1,150 to 2,950 ft) (Wagner *et al.* 1999; HINHP Database 2000). Associated species include *Bidens* sp., *Tetraplasandra* sp., *Alyxia oliviformis*, and *Psychotria* sp. (HINHP Database 2000).

The major threats to *Hesperomannia arbuscula* on Maui are habitat degradation by feral pigs, competition from alien plant species, trampling by humans, and extinction from naturally occurring random events due to the small number of populations (56 FR 55770).

Hibiscus brackenridgei

Hibiscus brackenridgei, a short-lived perennial and a member of the mallow family (Malvaceae). The species 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. Two subspecies are currently recognized, *Hibiscus brackenridgei* ssp. *brackenridgei* and *H. brackenridgei* ssp. *mokuleianus* (Bates 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 (USFWS 1999). Little else is known about the life history of this plant. Pollination biology, longevity, specific environmental requirements, and limiting factors are unknown.

Historically, *Hibiscus brackenridgei* was known from the islands of Kauai, Oahu, Lanai, Maui, Molokai, and Hawaii (USFWS 1999; HINHP Database 2000). *Hibiscus brackenridgei* was collected from an undocumented site on Kahoolawe, though the subspecies has never been determined (USFWS 1999). Currently, *Hibiscus brackenridgei* ssp. *mokuleianus* is known from Oahu and from undocumented observations on Kauai (Bates 1999; USFWS 1999). *Hibiscus brackenridgei* ssp. *brackenridgei* is currently known from Lanai, Maui, and Hawaii. On Maui, *Hibiscus brackenridgei* ssp. *brackenridgei* is found in five populations, containing 38 individuals, on or near State and privately owned lands at the northern base of Puu o kali, in the Lihau section of the West Maui NAR, Kaonohua Gulch, Keokea, and south of Puu o kali (GDSI 2000; HINHP Database 2000).

Hibiscus brackenridgei ssp. *brackenridgei* occurs in lowland dry forest from 130 to 800 m (425 to 2,625 ft) in elevation, sometimes with *Erythrina sandwicensis* as the dominant tree (Geesink *et al.* 1999; HINHP Database 2000). Associated plant species include *Myoporum* sp., *Chenopodium* sp. (ahe ahea), *Achyranthes* sp. (NCN), *Nototrichium* sp., *Diospyros* sp., *Chamaesyce celastroides* var. *lorifolia*, *Dodonaea viscosa*, *Canthium odoratum*, *Eurya sandwicensis* (anini), *Isachne distichophylla*, and *Sida fallax* (HINHP Database 2000).

The primary threats to *Hibiscus brackenridgei* ssp. *brackenridgei* on Maui are habitat degradation and possible predation by pigs, goats, cattle, axis deer, and rats; competition with alien plant species; and susceptibility to extinction caused by random environmental events or reduced reproductive vigor due to small population size and a limited number of populations (59 FR 56333).

Ischaemum byrone

Ischaemum byrone, a short-lived member of the grass family (Poaceae), is a perennial species with creeping underground and erect stems. *Ischaemum byrone* can be distinguished from other Hawaiian grasses by its tough outer flower bracts, dissimilar basic flower units, which are awned and two-flowered, and a di- or trichotomously branching inflorescence (O'Connor 1999).

Additional information on the life history of this plant, reproductive cycles, longevity, specific environmental requirements, and limiting factors is generally unknown (USFWS 1996).

Historically, *Ischaemum byrone* was reported from Oahu, Molokai, East Maui, the Island of Hawaii, and an undocumented site on Kauai (59 FR 10305; HINHP Database 2000). Currently, this species is found on Molokai, Hawaii, and Maui. On Maui, it is known from along the coast on private and State owned lands at Kahanu Gardens, Pauwalu Point, Honokalani, Kauiki Head, and on the following offshore islets: Keopuka Islet, Mokuhuki Islet, and Puukii Islet (GDSI 2000; HINHP Database 2000). There is a total of six populations with less than 3,000 individuals (HINHP Database 2000).

The habitat of *Ischaemum byrone* is coastal dry shrubland, occurring near the ocean among rocks or on basalt cliffs between sea level and 75 m (250 ft) (O'Connor 1999). Associated taxa include *Bidens* sp., *Fimbristylis cymosa* (Maui u aki aki), and *Scaevola sericea* (naupaka kahakai) (HINHP Database 2000).

The most serious threat to *Ischaemum byrone* is the invasion of alien plants, particularly *Digitaria ciliaris* (Henry's crabgrass), *Ardisia elliptica* (shoebuttan ardesia) and *Casuarina equisetifolia* (paina). Additionally, fire may pose a threat in areas infested with alien grasses, provided enough fuel is present. Other potential threats include grazing and browsing by goats and axis deer; disturbance incurred from these ungulates further promotes the introduction and establishment of alien weeds. Some populations are also threatened from residential development (59 FR 10305; USFWS 1996; HINHP Database 2000).

Lysimachia lydgatei

Lysimachia lydgatei, a short-lived perennial member of the primrose family (Primulaceae), is a sprawling, branched shrub with stems from 1 to 1.3 m (3 to 4 ft) long. This species is

distinguished from others in the genus by the dense hairs on both the upper and lower surfaces of mature leaves (Wagner *et al.* 1999).

Additional information on the life history of this plant, reproductive cycles, longevity, specific environmental requirements, and limiting factors is generally unknown (USFWS 1997).

Lysimachia lydgatei was known historically from a gulch behind Lahaina on West Maui and from Oahu. Currently, it is found only on Maui in the following locations on State-owned land in the Lihau section of the West Maui NAR: Halepohaku, Helu, and Kauaula-Olowalu (Wagner *et al.* 1999; HINHP Database 2000). The three Maui populations number approximately 240 individuals (GDSI 2000).

Lysimachia lydgatei typically grows on the sides of steep ridges in *Metrosideros polymorpha-Dicranopteris linearis* dominated wet to mesic shrubland or *Metrosideros-Cheirodendron* montane forest between elevations of about 915 to 1,415 m (3,000–4,640 ft) (HINHP Database 2000). Associated vegetation includes *Lycopodium* sp. (wawae iole), *Ilex* sp., *Dodonaea viscosa*, *Vaccinium* sp., *Eurya sandwicensis*, *Styphelia tameiameia*, *Coprosma* sp., *Ochrosia* sp. (holei), *Astelia* sp. (painiu), *Broussaisia arguta*, and mat ferns, such as *Dicranopteris* sp. (HINHP Database 2000).

The greatest threats to *Lysimachia lydgatei* are the threat of extinction from a random environmental event due to the small number of populations; competition with alien plant species, such as *Rubus argutus*; and fire (57 FR 20772; USFWS 1997).

Mariscus pennatiformis

Mariscus pennatiformis, a short-lived member of the sedge family (Cyperaceae), is a perennial plant with a woody root system covered with brown scales. *Mariscus pennatiformis* is subdivided into two subspecies, ssp. *bryanii* and ssp. *pennatiformis*, which are distinguished by the length and width of the spikelets; color, length, and width of the glume; and by the shape and length of the achenes. 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 (Koyama 1999).

Mariscus pennatiformis is known to flower from November to December after heavy rainfall. Additional information on the life history of this plant, reproductive cycles, longevity, specific environmental requirements,

and limiting factors is generally unknown (USFWS 1999).

Historically, *Mariscus pennatiformis* was known from Kauai, Oahu, East Maui (Keanae Valley, Hana, and Nahiku), the Island of Hawaii, and from Laysan in the Northwestern Hawaiian Islands (HINHP Database 2000). *M. pennatiformis* ssp. *bryanii* is only known from Laysan Island in the Northwestern Hawaiian Islands National Wildlife Refuge. *M. pennatiformis* ssp. *pennatiformis* is currently found only on East Maui. One population of approximately 30 individuals is found on State owned land near the mouth of Hanawi Stream (GDSI 2000; K. Wood *in litt.* 1999).

On Maui, *Mariscus pennatiformis* ssp. *pennatiformis* is found at elevations between sea-level and 6 m (20 ft) on brown soil with talus in *Pandanus* coastal wet cliffs and within reach of ocean spray. Associated native plant species include: *Sadleria pallida* (amau), *Pandanus tectorius* (hala), *Lysimachia mauritiana* (kolokolo kuahiwi), *Cyperus laevigatus* (makaloa), *Eragrostis variabilis*, and *Ipomoea* sp. (morning glory) (Koyama 1999; HINHP Database 2000; K. Wood *in litt.* 1999).

Threats to the only known population of *Mariscus pennatiformis* ssp. *pennatiformis* on Maui include grazing and habitat destruction caused by ungulates; competition from alien plant species; and extinction from random naturally occurring events (59 FR 56333; USFWS 1999).

Melicope knudsenii

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

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

Historically, *Melicope knudsenii* was known only from the southeast slope of Haleakala on Maui and from Kauai (HINHP Database 2000). This species remains on Kauai, but is only found on privately owned lands at the following locations on Maui: Auwahi, Puu Mahoi, and the Kanaio area. There are three populations with a single individual at each location (GDSI 2000; HINHP Database 2000).

Melicope knudsenii grows on forested flats or talus slopes in *Nestegis-Pleomele* mixed open dry forests at elevations of about 450 to 1,220 m (1,480 to 4,000 ft) (Stone *et al.* 1999). Associated native plant species include *Dodonaea viscosa*, *Osteomeles anthyllidifolia*, *Alphitonia ponderosa*, *Santalum ellipticum*, and *Xylosma hawaiiensis* (HINHP Database 2000).

Threats to *Melicope knudsenii* include habitat degradation by alien animals, such as goats and pigs; reduced reproductive vigor; fire; natural aging and death; and invasive plant species, such as *Pennisetum clandestinum* (59 FR 9304; USFWS 1995a).

Melicope mucronulata

Melicope mucronulata, a long-lived perennial of the citrus family (Rutaceae), is a small tree up to 4 m (13 ft) tall with oval to elliptic-oval leaves, 8 to 16 cm (3 to 6.5 in.) long and 3.5 to 6.5 cm (1.5 to 2.5 in.) wide. This species is distinguished from others in the genus by the growth habit, the number of flowers in each flower cluster, the size and shape of the fruit, and the degree of hairiness of the leaves and fruit walls (Stone *et al.* 1999).

Additional information on the life history of this plant, reproductive cycles, longevity, specific environmental requirements, and limiting factors is generally unknown (USFWS 1997).

First discovered in 1920 in Kanaio, East Maui, *Melicope mucronulata* was not relocated until 1983 when it was reported from State land with an unknown number of plants. This species was also found two years later on East Molokai (Stone *et al.* 1999; GDSI 2000; HINHP Database 2000).

Melicope mucronulata typically grows on steep, west- or north-facing, dry to mesic, forested lowland slopes at elevations of 670 to 1,070 m (2,200 to 3,500 ft) (HINHP Database 2000). Associated native species include *Dodonaea viscosa*, *Metrosideros polymorpha*, *Styphelia tameiameia*, and *Dubautia linearis* (na ena e) (USFWS 1997).

The major threat to the continued existence of the only known population of *Melicope mucronulata* on Maui is the risk of extinction from a random environmental event. Habitat degradation by goats and pigs, predation by goats, and competition with alien plants, particularly *Melinis minutiflora*, also pose immediate threats to this species (57 FR 20772; USFWS 1997).

Neraudia sericea

Neraudia sericea, a short-lived perennial member of the nettle family

(Urticaceae), is a 3 to 5 m (10 to 16 ft) tall shrub with densely hairy branches. The elliptic or oval leaves have smooth margins or slightly toothed margins on young leaves. The upper leaf surface is moderately hairy and the lower leaf surface is densely covered with irregularly curved, silky gray to white hairs along the veins. The male flowers may be stalkless or have short stalks. The female flowers are stalkless and have a densely hairy calyx that is either toothed, collar-like, or divided into narrow unequal segments. The fruits are achenes with the apical section separated from the basal portion by a deep constriction. Seeds are oval with a constriction across the upper half. *N. sericea* differs from the other four closely related species of this endemic Hawaiian genus by the density, length, color, and posture of the hairs on the lower leaf surface and by its mostly entire leaf margins (Wagner *et al.* 1999).

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

Neraudia sericea was known historically from Molokai, Lanai, Olowalu Valley on West Maui, the southern slopes of Haleakala on East Maui, and from Kahoolawe (HINHP Database 2000). Currently, this species is known from Molokai and Maui. On Maui, three populations totaling more than four individuals are found in Pohakea Gulch (West Maui) and in Manawainui and Kamole Gulches (East Maui). These populations occur on State and privately owned lands (GDSI 2000; HINHP Database 2000; M. Kaiaokamelie, *in litt.* 2000).

Neraudia sericea generally occurs in lowland dry to mesic *Metrosideros polymorpha-Dodonaea viscosa-Styphelia tameiameia* shrubland or forest or *Acacia koa* forest between 670 and 1,480 m (2,200 and 4,850 ft) in elevation (Wagner *et al.* 1999; HINHP Database 2000; M. Bruegmann *in litt.* 1995). Other associated plant species include *Huperzia mannii* (NCN), *Urera glabra* (opuhe), *Cyrtandra oxybapha* (haiwale), *Cyrtandra platyphylla*, *Sida fallax*, *Diospyros* sp., *Bobea* sp., *Coprosma* sp., and *Hedyotis* sp. (HINHP Database 2000; M. Bruegmann *in litt.* 1995).

The primary threats to *Neraudia sericea* on Maui are habitat degradation by feral pigs and goats; competition with the alien plants, *Melinis minutiflora*, *Pennisetum clandestinum*, *Holcus lanatus*, *Cymbopogon refractus* (barbwire grass), and nonnative *Eragrostis* sp. (love grass); and a risk of

extinction due to random environmental events (59 FR 56333; USFWS 1999).

Peucedanum sandwicense

Peucedanum sandwicense, a member of the parsley family (Apiaceae), is a short-lived, 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).

Additional information on the life history of this plant, reproductive cycles, longevity, specific environmental requirements, and limiting factors is generally unknown (USFWS 1995a).

Historically and currently, *Peucedanum sandwicense* is known from Molokai, Maui, and Kauai (HINHP Database 2000). Discoveries in 1990 extended the known distribution of this species to the island of Oahu (USFWS 1995a). A population is known from State-owned Keopuka Islet, off the coast of Maui with a total of between 20–30 individuals (GDSI 2000; HINHP Database 2000).

This species grows in cliff habitats from sea level to above 900 m (2,950 ft) (Constance and Affolter 1999) and is associated with native species such as *Chamaesyce* sp. (akoko), *Eragrostis* sp., *Diospyros* sp., and *Metrosideros polymorpha* (USFWS 1995a; HINHP Database 2000).

Competition with introduced plants is the major threat to *Peucedanum sandwicense* on Keopuka Rock (59 FR 9304; USFWS 1995a).

Phlegmariurus mannii

Phlegmariurus mannii, a short-lived member of the clubmoss family (Lycopodiaceae), is a hanging epiphyte (growing on the outside of other plants instead of being rooted in the ground) with clustered, delicate red stems and forked reproductive spikes; these traits distinguish it from others in the genus in Hawaii (Degener and Degener 1959; St. John 1981; Wagner and Wagner 1992).

Additional information on the life history of this plant, reproductive cycles, longevity, specific environmental requirements, and limiting factors is generally unknown (USFWS 1997).

Historically, *Phlegmariurus mannii* was known from Kauai, West Maui (Haelaau and Hanaula), and the Island of Hawaii (HINHP Database 2000). Currently, this species is found on Maui and Hawaii. On Maui, this species is now known on State and private lands from Kaupo, Nuanualoa Stream, and Manawainui on East Maui; and from

Lihau and Puu Kukui on West Maui (GDSI 2000; HINHP Database 2000). There are five populations with fewer than 300 individuals total (HINHP Database 2000).

On Maui, *Phlegmariurus mannii* typically grows in moist protected gulches on the native tree species *Metrosideros polymorpha*, and *Acacia koa*, in mesic to wet montane *M. polymorpha*-*A. koa* forests at elevations of 900 to 1,600 m (2,950 to 5,250 ft) (HINHP Database 2000). Associated native species include *Thelypteris* sp., *Athyrium* sp., *Styphelia tameiameia*, *Cyanea* sp., *Machaerina* sp., *Cyrtandra* sp., *Sadleria* sp., *Vaccinium* sp., *Dodonaea viscosa*, *Astelia menziesiana* (kaluaha), *Coprosma* sp., *Cheirodendron trigynum*, *Ilex anomala*, and *Myrsine* sp. (HINHP Database 2000).

The primary reasons for the endangerment of this species are habitat alteration by goats, cattle and pigs, and the impacts of alien plant species. Additionally, small population sizes also make the species subject to extinction due to random environmental events (57 FR 20772; USFWS 1997).

Phyllostegia mollis

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 6, are spaced along a stem; there are 2 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 five 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 (USFWS 1998b).

Historically, *Phyllostegia mollis* was known from Oahu, Molokai, and East Maui (Wagner *et al.* 1999, HINHP Database 2000). Currently, this species is only known from Oahu and Maui. On East Maui, a single population of an unknown number of individuals remains on State and private lands in Waiopai Gulch (GDSI 2000; HINHP Database 2000).

Phyllostegia mollis typically grows on steep slopes and in gulches in diverse mesic to wet forests at an elevation of 450 to 1,830 m (1,480 to 6,000 ft) (Wagner *et al.* 1999). Associated plants include ferns, *Psychotria* sp., and *Pisonia* sp. (papala kepa) (HINHP Database 2000).

The major threats to *Phyllostegia mollis* are competition from the alien plant species *Rubus* sp. and *Schinus terebinthifolius*; and a risk of extinction of the only known population of this species on Maui due to random environmental events (56 FR 55770; USFWS 1998b).

Plantago princeps

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

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 and Oahu; var. *longibracteata* is known from Kauai and Oahu; var. *princeps* is known from Oahu; and var. *laxiflora* is known from Molokai and Maui. On Maui, there are five populations of *Plantago princeps* var. *laxiflora*, with a total of 67 individuals, on State, Federal and privately owned lands. This variety is found on East Maui at Koolau Gap, Kaupo Gap, and Kipahulu Valley, and on West Maui in Iao Valley and Kauaula Valley (USFWS 1999; GDSI 2000; HINHP Database 2000).

On Maui, *Plantago princeps* var. *laxiflora* is typically found on basalt cliffs in *Metrosideros polymorpha* lowland wet forest or *Acacia koa*-*M. polymorpha* montane wet forest or *M. polymorpha* montane wet shrubland, from 400 to 2,050 m (1,300 to 6,700 ft)

elevation (Wagner *et al.* 1999). Associated plant species include *Eragrostis variabilis*, *Hedyotis formosa*, and *Dubautia plantaginea* spp. *humilis* (USFWS 1999; HINHP Database 2000).

The primary threats to *Plantago princeps* var. *laxiflora* on Maui are herbivory and habitat degradation by feral pigs and goats, and competition with various alien plant species (59 FR 56333; USFWS 1999).

Platanthera holochila

Platanthera holochila, a short-lived, perennial 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.

Historically, *Platanthera holochila* was known from Maui, Oahu, Molokai, and Kauai (HINHP Database 2000). Currently, *Platanthera holochila* is extant on Kauai, Molokai, and Maui (HINHP Database 2000). On Maui, three populations with 28 individuals are reported on State and privately owned lands from Hanaula and the Kapaloa Gulch rim on West Maui, and from Koolau Gap on East Maui (GDSI 2000; HINHP Database 2000).

Platanthera holochila is found in *Metrosideros polymorpha-Dicranopteris linearis* montane wet forest or *M. polymorpha* mixed montane bog or mesic scrubby *M. polymorpha* forest between 1,050–2,120 m (3,440–6,960 ft) elevation. Associated native plants include *Cibotium* sp., *Coprosma ernodeoides* (nene), *Oreobolus furcatus* (NCN), *Styphelia tameiameia*, *Wikstroemia* sp., *Scaevola chamissoniana* (naupaka kuahiwi), *Sadleria* sp., *Lythrum maritimum* (pukamole), *Deschampsia* sp., *Metrosideros polymorpha*, *Luzula hawaiiensis* (wood rush), *Sisyrinchium acre* (Maui u la ili), *Broussaisia arguta*, *Clermontia* sp., *Lycopodium cernuum* (wawae iole), *Dubautia scabra* (na ena e), *Polypodium pellucidum*, *Gahnia gahniiformis* (NCN), and *Vaccinium reticulatum* (61 FR 53108; USFWS 1999).

The primary threats to *Platanthera holochila* on Maui are habitat degradation and/or destruction by feral pigs; competition with alien plants; and a risk of extinction on Maui from naturally occurring events and/or

reduced reproductive vigor, due to the small number of remaining populations and individuals. Predation by slugs may also be a potential threat to this species (61 FR 53108; USFWS 1999).

Pteris lidgatei

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 (Wagner 1949). *P. 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).

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

Historically, *Pteris lidgatei* was found on Oahu, Molokai, and Waihee on West Maui (HINHP Database 2000). Currently, this species is known from Oahu and Maui. Two populations with approximately 20 individuals occur on Maui, one population on privately owned land in Kahuaula Valley and the other population on State owned land near Kahakuloa Stream (GDSI 2000; HINHP Database 2000).

This species grows on steep stream banks between 915 to 1,070 m (3,000 to 3,500 ft) elevation in wet *Metrosideros polymorpha-Dicranopteris linearis* montane forest with mosses and other ferns, including *Cibotium chamissoi* (hapuu), *Dicranopteris linearis*, *Elaphoglossum crassifolium* (ekaha), *Sadleria squarrosa* (amau), and *Sphenomeris chusana* (palaa) (HINHP Database 2000).

The primary threats to *Pteris lidgatei* on Maui are the alien plant *Clidemia hirta*, habitat destruction by feral pigs, and a risk of extinction due to random environmental events (59 FR 49025; USFWS 1998a).

Sanicula purpurea

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. 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 this plant, reproductive cycles, longevity, specific environmental requirements, and limiting factors is generally unknown (USFWS 1999).

Historically and currently, *Sanicula purpurea* is known from Oahu and West Maui (HINHP Database 2000). On West Maui, four populations totaling between 130 and 250 individuals are currently known on State and private lands in Keahikauo, Eke Crater, Violet Lake, and Puu Kukui (GDSI 2000; HINHP Database 2000).

This species typically grows in open *Metrosideros polymorpha* mixed montane bogs between 1,000 and 1,620 m (3,280 and 5,330 ft) elevation (HINHP Database 2000). Associated plant taxa include *Styphelia tameiameia*, *Gahnia beechyi* (NCN), *Geranium humile* (nohoanu), *Myrsine vaccinioides* (kolea), *Viola mauiensis* (pamakani), *Argyroxiphium caliginis* (eke silversword), *Plantago pachyphylla* (laukahi kuahiwi), *Lycopodium* sp., *Argyroxiphium grayanum*, *Lagenifera mauiensis* (howaiaulu), *Machaerina* sp., and *Oreobolus furcatus* (HINHP Database 2000).

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 are the major threats to *Sanicula purpurea* (61

FR 53108; USFWS 1999; HINHP Database 2000).

Sesbania tomentosa

Sesbania tomentosa, a short-lived member of the legume 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. *S. tomentosa* is the only endemic Hawaiian species in the genus, differing from the naturalized *S. sesban* by the color of the flowers, the longer petals and calyx, and the number of seeds per pod (Geesink et al. 1999).

The pollination biology of *Sesbania tomentosa* is being studied by David Hopper, a graduate student in the Department of Zoology at the University of Hawaii at Manoa. His preliminary findings suggest that although many insects visit *Sesbania* flowers, the majority of successful pollination is accomplished by native bees of the genus *Hylaeus* and that populations at Kaena Point on Oahu are probably pollinator limited. Flowering at Kaena Point is highest during the winter-spring rains, and gradually declines throughout the rest of the year (USFWS 1999). Other aspects of this plant's life history are unknown.

Currently, *Sesbania tomentosa* occurs on at least six of the eight main Hawaiian Islands (Kauai, Oahu, Molokai, Kahoolawe, Maui, and Hawaii) and in the Northwestern Hawaiian Islands (Nihoa and Necker). It is no longer extant on Niihau and Lanai (59 FR 56333; USFWS 1999; GDSI 2000; HINHP Database 2000). On Maui, *S. tomentosa* is known from seven populations with a total of 83 individuals. The populations are located on State-leased land at Kanaio Training Area on East Maui; and on State and privately owned lands at Olowalu Canyon, Mokolea Point, Kahakuloa, Nakalele Point, and Poelua Bay on West Maui (GDSI 2000; HINHP Database 2000; B. Hobdy *in litt.* 2000). Off the south central coast of Kahoolawe, approximately 100 individuals of *S. tomentosa* are found on a small islet, Puu Koae, a State-owned seabird sanctuary (USFWS 1999; HINHP Database 2000).

Sesbania tomentosa is found in *Scaevola sericea* coastal dry shrublands on windswept slopes, sea cliffs and cinder slopes between sea level and 580 m (1,900 ft) elevation (HINHP Database 2000). Associated plant species include *Lipochaeta integrifolia*, *Jacquemontia ovalifolia* ssp. *sandwicensis* (pa uohi

iaka), *Rhynchelytrum repens*, *Sida fallax*, and *Dodonaea viscosa* (USFWS 1999; HINHP Database 2000).

The primary threats to *Sesbania tomentosa* on Maui are habitat degradation caused by competition with various alien plant species such as *Lantana camara*, *Waltheria* sp., and grass species; feral cattle; lack of adequate pollination; seed predation by rats, mice and, potentially, alien insects; fire; and destruction by off-road vehicles and other human disturbances (59 FR 56333; USFWS 1999). Threats to *Sesbania tomentosa* on Puu Koae include habitat degradation caused by competition with various alien plant species, erosion, and trampling by cats and seabirds (P. Higashino, pers. comm. 2000).

Spermolepis hawaiiensis

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

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

Historically, *Spermolepis hawaiiensis* was known from the islands of Kauai, Oahu, Lanai, and Hawaii (HINHP Database 2000). Currently, it is extant on Kauai, Oahu, Molokai, Lanai, West Maui, and Hawaii (59 FR 56333; GDSI 2000; HINHP Database 2000). On Maui, there are three known populations with hundreds to thousands of individuals on State owned lands in Kuia NAR and Kanaio NAR, and on privately owned land in Lihau (USFWS 1999; GDSI 2000; HINHP Database 2000; C. Chimera, pers. comm. 2000).

Spermolepis hawaiiensis is known from shady spots in *Dodonaea viscosa* lowland dry shrubland, at elevations from 300 to 550 m (980 to 1,800 ft). Associated plant species include *Eragrostis variabilis*, *Wikstroemia* sp., *Erythrina sandwicensis*, *Diospyros* sp., *Pleomele* sp., *Lipochaeta livarum*, *Sida fallax*, *Myoporum sandwicensis*, *Santalum ellipticum*, and *Heteropogon*

contortus (USFWS 1999; HINHP Database 2000; C. Chimera, pers. comm. 2000).

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

Vigna o-wahuensis

Vigna o-wahuensis, a member of the legume family (Fabaceae), is a slender, twining, long-lived 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 7 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 is generally unknown (USFWS 1999).

Historically, *Vigna o-wahuensis* was known from Niihau, Oahu, and on East Maui in Makawao, Waiakoa, and Haleakala, and at an unspecified site on West Maui (HINHP Database 2000). 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 (HINHP Database 2000). On the State-owned island of Kahoolawe, there are a total of three populations with an unknown number of individuals in the Makaalae/Lua Kealialalo area at 140 m (460 ft) elevation, the Puhi a Nanue area near a tidal pond, and on Lua Makika (GDSI 2000; HINHP Database 2000). On Maui, there is a single population of 2 individuals on State owned land in the Kanaio Beach area of East Maui (GDSI 2000; C. Chimera, pers. comm. 2000).

On Kahoolawe, *Vigna o-wahuensis* occurs in dry to mesic grassland and shrubland from 10 to 140 m (30 to 460 ft) in elevation (Geesink et al. 1999;

HINHP Database 2000). Associated plant species include *Sida fallax*, *Chenopodium* sp., *Dubautia menziesii*, and *Osteomeles anthyllidifolia* (HINHP Database 2000). On Maui, *Vigna o-wahuensis* occurs in dry forests around 12 m (40 ft) elevation (C. Chimera, pers. comm. 2000). Associated plant species on Maui include *Dodonaea viscosa*, *Chamaesyce* sp., *Nothoecstrum latifolium*, and *Nesoluma polynesianum* (C. Chimera, pers. comm. 2000).

The primary threats to *Vigna o-wahuensis* on Kahoolawe are competition with various alien plant species; fire; and a risk of extinction due to random environmental events, and/or reduced reproductive vigor due to the small number of existing populations and individuals (59 FR 56333; USFWS 1999). The primary threats to this species on Maui are competition with the alien plant species *Lantana camara* and *Cenchrus ciliaris* (buffelgrass) and herbivory by axis deer and goats.

Zanthoxylum hawaiiense

Zanthoxylum hawaiiense, a long-lived perennial, is a medium-size tree with pale to dark gray bark, and lemon-scented leaves in the rue family (Rutaceae). Alternate leaves are

composed of three small triangular-oval to lance-shaped, toothed leaves (leaflets) with surfaces usually without hairs. *Zanthoxylum hawaiiense* is distinguished from other Hawaiian members of the genus by several characters: three leaflets all of similar size, one joint on lateral leaf stalk, and sickle-shape fruits with a rounded tip (Stone et al. 1999).

Additional information on the life history of this plant, reproductive cycles, longevity, specific environmental requirements, and limiting factors is generally unknown (USFWS 1996).

Historically, *Zanthoxylum hawaiiense* was known from the islands of Kauai, Molokai, Lanai, Hawaii, and southern and southwestern slopes of Haleakala on Maui. Currently, *Zanthoxylum hawaiiense* is extant on Kauai, Molokai, Maui, and Hawaii. This species is found on eastern Maui in three populations (unknown number of individuals) on private and State lands at Auwahi, Lualailua, and Kanaio (GDSI 2000; HINHP Database 2000).

Zanthoxylum hawaiiense is reported from open lowland dry or mesic *Nestegis sandwicensis*-*Pleomele auwahiensis* forests, or montane dry

forest, at elevations between 550 and 1,740 m (1,800 and 5,710 ft) (59 FR 10305; Stone et al. 1999; HINHP Database 2000). Associated species include *Metrosideros polymorpha*, *Diospyros sandwicensis*, *Pisonia* sp., *Xylosma hawaiiensis*, *Santalum ellipticum*, *Alphitonia ponderosa*, *Osteomeles anthyllidifolia*, *Alectryon macrococcus*, *Charpentiera* sp., *Melicope* sp., *Dodonaea viscosa*, *Streblus pendulinus*, *Myrsine lanaiensis*, and *Sophora chrysophylla* (HINHP Database 2000).

The threats to *Zanthoxylum hawaiiense* on Maui include browsing, grazing, and trampling by feral goats and cattle; competition with the alien plant species *Melia azedarach* (chinaberry), *Lantana camara*, and *Pennisetum setaceum*; fire; human disturbance; and risk of extinction from naturally occurring events and/or reduced reproductive vigor due to the small number of populations (59 FR 10305; USFWS 1996).

A summary of populations and landownership for the 55 plant species on Maui and Kahoolawe is given in Table 3.

TABLE 3.—SUMMARY OF POPULATIONS AND LANDOWNERSHIP FOR 55 SPECIES ON MAUI AND KAHOO LAWE

Species	Number of current populations	Landownership		
		Federal	State	Private
<i>Acaena exigua</i>	0			
<i>Alectryon macrococcus</i>	6		X	X
<i>Argyroxiphium sandwicense</i>	7	X		X
<i>Bidens micrantha</i> ssp. <i>kalealaha</i>	4	X	X	
<i>Bonamia menziesii</i>	3		X	X
<i>Cenchrus agrimonioides</i>	1		X	
<i>Centaurium sebaeoides</i>	3		X	X
<i>Clermontia lindseyana</i>	2		X	X
<i>Clermontia oblongifolia</i> ssp. <i>mauiensis</i>	1		X	X
<i>Clermontia samuelii</i>	8	X	X	
<i>Colubrina oppositifolia</i>	2			X
<i>Ctenitis squamigera</i>	6		X	X
<i>Cyanea copelandii</i> ssp. <i>haleakalaensis</i>	3	X	X	X
<i>Cyanea glabra</i>	1			X
<i>Cyanea grimesiana</i> spp. <i>grimesiana</i>	2		X	X
<i>Cyanea hamatiflora</i> spp. <i>hamatiflora</i>	9	X	X	X
<i>Cyanea lobata</i>	1			X
<i>Cyanea mceldowneyi</i>	6		X	X
<i>Cyrtandra munroi</i>	1		X	X
<i>Diellia erecta</i>	4		X	X
<i>Diplazium molokaiense</i>	2		X	X
<i>Dubautia plantaginea</i> spp. <i>humilis</i>	2		X	X
<i>Flueggea neowawraea</i>	2		X	X
<i>Geranium arboreum</i>	10	X	X	X
<i>Geranium multiflorum</i>	9	X	X	X
<i>Hedyotis coriacea</i>	1		X	
<i>Hedyotis mannii</i>	1			X
<i>Hesperomannia arborescens</i>	1		X	X
<i>Hesperomannia arbuscula</i>	3			X
<i>Hibiscus brackenridgei</i>	5		X	X
<i>Ischaemum byrone</i>	6		X	X
<i>Kanaloa kahoolawensis</i>	1		X	
<i>Lipochaeta kamolensis</i>	1		X	X
<i>Lysimachia lydgatei</i>	3		X	

TABLE 3.—SUMMARY OF POPULATIONS AND LANDOWNERSHIP FOR 55 SPECIES ON MAUI AND KAHOOLOWE—Continued

Species	Number of current populations	Landownership		
		Federal	State	Private
<i>Mariscus pennatiformis</i>	1		X	
<i>Melicope adscendens</i>	3		X	X
<i>Melicope balloui</i>	2	X		X
<i>Melicope knudsenii</i>	3			X
<i>Melicope mucronulata</i>	1		X	
<i>Melicope ovalis</i>	1	X		
<i>Neraudia sericea</i>	3		X	X
<i>Peucedanum sandwicense</i>	1		X	
<i>Phlegmariurus mannii</i>	5		X	X
<i>Phyllostegia mollis</i>	1		X	X
<i>Plantago princeps</i>	5	X	X	X
<i>Platanthera holochila</i>	3		X	X
<i>Pteris lidgatei</i>	2		X	X
<i>Remya mauiensis</i>	3		X	
<i>Sanicula purpurea</i>	4		X	X
<i>Schiedea haleakalensis</i>	2	X		
<i>Sesbania tomentosa</i>	8		X	X
<i>Spermolepis hawaiiensis</i>	3		X	X
<i>Tetramolopium capillare</i>	4		X	X
<i>Vigna o-wahuensis</i>	4		X	
<i>Zanthoxylum hawaiiense</i>	3		X	X

Previous Federal Action

Federal action on these plants began as a result of Section 12 of the Act, which directed the Secretary of the Smithsonian Institution to prepare a report on plants considered to be endangered, threatened, or extinct in the United States. This report, designated as House Document No. 94-51, was presented to Congress on January 9, 1975. In that document, *Alectryon macrococcus* (as *Alectryon macrococcum* var. *macrococcum* and *Alectryon mahoe*), *Bonamia menziesii*, *Clermontia lindseyana*, *Colubrina oppositifolia*, *Cyanea glabra* (as *Cyanea scabra* var. *variabilis*), *Cyanea lobata* (as *Cyanea baldwinii*), *Cyanea mceldowneyi*, *Flueggea neowawraea* (as *Drypetes phyllanthoides*), *Geranium arboreum*, *Geranium multiflorum* (as *Geranium multiflorum* var. *multiflorum*, var. *obatifolium*, and var. *superbum*), *Hedyotis mannii* (as *Hedyotis thyrsoides* var. *thyrsoides*), *Hesperomannia arborescens* (as *Hesperomannia arborescens* var. *bushiana* and var. *swezeyi*), *Hesperomannia arbuscula*, *Hibiscus brackenridgei* (as *Hibiscus brackenridgei* var. *brackenridgei*, var. *mokuleianus*, and var. "from Hawaii"), *Ischaemum byrone*, *Melicope balloui* (as *Pelea balloui*), *Melicope knudsenii* (as *Pelea multiflora*), *Melicope ovalis* (as *Pelea ovalis*), *Neraudia sericea* (as *Neraudia kahoolawensis*), *Peucedanum sandwicense* (as *Peucedanum kauaiense*), *Phyllostegia mollis*, *Plantago princeps* (as *Plantago princeps* var. *elata*, var. *laxifolia*, var. *princeps*), *Remya mauiensis*, *Sesbania tomentosa*

(as *Sesbania hobydi* and *Sesbania tomentosa* var. *tomentosa*), *Vigna o-wahuensis* (as *Vigna sandwicensis* var. *heterophylla* and var. *sandwicensis*), and *Zanthoxylum hawaiiense* (as *Zanthoxylum hawaiiense* var. *citiodora*), were considered to be endangered; *Cyrtandra munroi*, *Diellia erecta*, and *Zanthoxylum hawaiiense* (as *Zanthoxylum hawaiiense* var. *hawaiiense* and var. *velutinosum*) were considered to be threatened; and, *Bidens micrantha* ssp. *kalealaha* (as *Bidens distans* and *Bidens micrantha* spp. *kalealaha*), *Ctenitis squamigera*, *Diplazium molokaiense*, *Hedyotis coriacea*, *Melicope knudsenii* (as *Pelea knudsenii* and *Pelea tomentosa*), *Melicope mucronulata* (as *Pelea mucronulata*), *Phlegmariurus mannii* (as *Lycopodium mannii*), *Plantago princeps* (as *Plantago princeps* var. *acaulis*, var. *denticulata*, and var. *queleniana*), *Pteris lidgatei*, and *Tetramolopium capillare* were considered extinct. On July 1, 1975, the Service published notice in the **Federal Register** (40 FR 27823) of its acceptance of the Smithsonian report as a petition within the context of Section 4(c)(2) (now Section 4(b)(3)) of the Act, and gave notice of its intention to review the status of the plant taxa named therein. As a result of that review, on June 16, 1976, the Service published a proposed rule in the **Federal Register** (41 FR 24523) to determine endangered status pursuant to Section 4 of the Act for approximately 1,700 vascular plant taxa, including all of the above taxa considered to be endangered or thought

to be extinct except for *Cyanea glabra* and *Cyrtandra munroi*; additionally, *Argyroxiphium sandwicense* ssp. *macrocephalum* (as *Argyroxiphium macrocephalum*) appeared in the 1976 proposed rule as endangered. 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 two years old be withdrawn. A one-year grace period was given to proposals already over two years old. On December 10, 1979, the Service published a notice in the **Federal Register** (44 FR 70796) withdrawing the portion of the June 16, 1976, proposal that had not been made final, along with four other proposals that had expired. The Service published updated notices of review for plants on December 15, 1980 (45 FR 82479), September 27, 1985 (50 FR 39525), February 21, 1990 (55 FR 6183), September 30, 1993 (58 FR 51144), February 28, 1996 (61 FR 7596), and September 19, 1997 (62 FR 49398). A summary of the status categories for the 55 plant species in the 1980-1997 notices of review can be found in Table 4(a). The 55 species were listed as endangered or threatened between 1991 and 1999. A summary of the listing actions can be found in Table 4(b).

TABLE 4(A).—SUMMARY OF CANDIDACY STATUS FOR 55 PLANT SPECIES ON MAUI AND KAHOO LAWE

Species	FEDERAL REGISTER Notice of Review					
	1980	1985	1990	1993	1996	1997
<i>Acaena exigua</i>	C1	C1	C1			
<i>Alectryon macrococcus</i>	C1	C1	C1			
<i>Argyroxiphium sandwicense</i> ssp. <i>macrocephalum</i>	C1	C1	C1			
<i>Bidens micrantha</i> ssp. <i>kalealaha</i>	C1	C1	C1			
<i>Bonamia menziesii</i>	C1	C1	C1			
<i>Cenchrus agrimonioides</i>						
<i>Centaurium sebaeoides</i>			C1			
<i>Clermontia lindseyana</i>	C1	C1	C1			
<i>Clermontia oblongifolia</i> ssp. <i>mauiensis</i>			C1			
<i>Clermontia samuelii</i>						
<i>Colubrina oppositifolia</i>	C1	C1	C1			
<i>Ctenitis squamigera</i>	C1*	C1*	C1*			
<i>Cyanea copelandii</i> ssp. <i>haleakalaensis</i>					C	
<i>Cyanea glabra</i>					C	
<i>Cyanea grimesiana</i> spp. <i>grimesiana</i>	C1	C1		C2		
<i>Cyanea hamatiflora</i> spp. <i>hamatiflora</i>					C	
<i>Cyanea lobata</i>	C1	C1	C1			
<i>Cyanea mceldowneyi</i>	C1	C1	C1			
<i>Cyrtandra munroi</i>	C2	C2	C1			
<i>Diellia erecta</i>	C1	C1	C1			
<i>Diplazium molokaiense</i>	C1*	C1*	C1			
<i>Dubautia plantaginea</i> spp. <i>humilis</i>			C2	C2	C	
<i>Flueggea neowawraea</i>	C1	C1	C1			
<i>Geranium arboreum</i>	C1	C1	C1			
<i>Geranium multiflorum</i>	C1	C1	C1			
<i>Hedyotis coriacea</i>	C1	C1	C1			
<i>Hedyotis mannii</i>	C1	C1	C1			
<i>Hesperomannia arborescens</i>	C1	C1	C1			
<i>Hesperomannia arbuscula</i>	C1	C1	C1			
<i>Hibiscus brackenridgei</i>	C1	C1	C1			
<i>Ischaemum byrone</i>	C1	C1	C1			
<i>Kanaloa kahoolawensis</i>					C	
<i>Lipochaeta kamolensis</i>	C1	C1	C1			
<i>Lysimachia lydgatei</i>			C1			
<i>Mariscus pennatifolius</i>		C1	C1			
<i>Melicope adscendens</i>			3A			
<i>Melicope balloui</i>	C1	C1	C1*			
<i>Melicope knudsenii</i>	C1*	C1*	C1			
<i>Melicope mucronulata</i>	C1	C1	C1			
<i>Melicope ovalis</i>	C1	C1*	C1*			
<i>Neraudia sericea</i>	3A	3A	C1			
<i>Peucedanum sandwicense</i>	C2	C2	C2			
<i>Phlegmarius mannii</i>	C1	C1	C1			
<i>Phyllostegia mollis</i>	C1	C1	C1			
<i>Plantago princeps</i>	C2	C2	C1			
<i>Platanthera holochila</i>	C1	C1	C1	C2		
<i>Pteris lidgatei</i>	C1	C1	C1			
<i>Remya mauiensis</i>	C1	C1				
<i>Sanicula purpurea</i>						
<i>Schiedea haleakalensis</i>		C1	C1			
<i>Sesbania tomentosa</i>	C1*	C1*	C1			
<i>Spermolepis hawaiiensis</i>			C1			
<i>Tetramolopium capillare</i>	C1*	C1*	C1*			
<i>Vigna o-wahuensis</i>	C1	C1	C1			
<i>Zanthoxylum hawaiiense</i>	C1	C1	C1			

Key:

C: Taxa for which the Service sufficient information on biological vulnerability and threats to support proposals to list them as endangered or threatened taxa.

C1: Taxa for which the Service has on file enough substantial information on biological vulnerability and threat(s) to support proposals to list them as endangered or threatened species.

C1*: Taxa of known vulnerable status in the recent past that may already have become extinct.

C2: Taxa for which there is some evidence of vulnerability, but for which there are not enough data to support listing proposals at this time.

3A: Taxa for which the Service has persuasive evidence of extinction. If rediscovered, such taxa might acquire high priority for listing.

Federal Register Notice of Review

1980: 45 FR 82479

1985: 50 FR 39525

1990: 55 FR 6183

1993: 58 FR 51144

1996: 61 FR 7596

1997: 62 FR 49398

TABLE 4(B).—SUMMARY OF LISTING ACTIONS FOR 55 PLANT SPECIES ON MAUI AND KAHOO LAWE

Species	Federal status	Proposed rule		Final rule	
		Date	Federal Register	Date	Federal Register
<i>Acaena exigua</i>	E	05/24/91	56 FR 23842	05/15/92	57 FR 20787
<i>Alecryon macrococcus</i>	E	05/24/91	56 FR 23842	05/15/92	57 FR 20772
<i>Argyroxiphium sandwicense</i> ssp. <i>macrocephalum</i>	T	05/24/91	56 FR 23842	05/15/92	57 FR 20772
<i>Bidens micrantha</i> ssp. <i>kalealaha</i>	E	05/24/91	56 FR 23842	05/15/92	57 FR 20772
<i>Bonamia menziesii</i>	E	09/14/93	58 FR 48012	11/10/94	59 FR 56333
<i>Cenchrus agrimonoides</i>	E	10/02/95	60 FR 51417	10/10/96	61 FR 53108
<i>Centaurium sebaeoides</i>	E	09/28/90	55 FR 39664	10/29/91	56 FR 55770
<i>Clermontia lindseyana</i>	E	12/17/92	57 FR 59951	03/04/94	59 FR 10305
<i>Clermontia oblongifolia</i> ssp. <i>mauiensis</i>	E	05/24/91	56 FR 23842	05/15/92	57 FR 20772
<i>Clermontia samuelii</i>	E	05/15/97	62 FR 26757	09/03/99	64 FR 48307
<i>Colubrina oppositifolia</i>	E	12/17/92	57 FR 59951	03/04/94	59 FR 10305
<i>Ctenitis squamigera</i>	E	06/24/93	58 FR 34231	09/09/94	59 FR 49025
<i>Cyanea copelandii</i> ssp. <i>haleakalaensis</i>	E	05/15/97	62 FR 26757	09/03/99	64 FR 48307
<i>Cyanea glabra</i>	E	05/15/97	62 FR 26757	09/03/99	64 FR 48307
<i>Cyanea grimesiana</i> ssp. <i>grimesiana</i>	E	10/02/95	60 FR 51417	10/10/96	61 FR 53108
<i>Cyanea hamatiflora</i> ssp. <i>hamatiflora</i>	E	05/15/97	62 FR 26757	09/03/99	64 FR 48307
<i>Cyanea lobata</i>	E	05/24/91	56 FR 23842	05/15/92	57 FR 20772
<i>Cyanea mceldowneyi</i>	E	05/24/91	56 FR 23842	05/15/92	57 FR 20772
<i>Cyrtandra munroi</i>	E	05/24/91	56 FR 23842	05/15/92	57 FR 20772
<i>Diellia erecta</i>	E	09/14/93	58 FR 48012	11/10/94	59 FR 56333
<i>Diplazium molokaiense</i>	E	06/24/93	58 FR 34241	09/09/94	59 FR 49025
<i>Dubautia plantaginea</i> ssp. <i>humilis</i>	E	05/15/97	62 FR 26757	09/03/99	64 FR 48307
<i>Flueggea neowawraea</i>	E	09/14/93	58 FR 48012	11/10/94	59 FR 56333
<i>Geranium arboreum</i>	E	01/23/91	56 FR 2490	05/13/92	57 FR 20589
<i>Geranium multiflorum</i>	E	05/24/91	56 FR 23842	05/15/92	57 FR 20772
<i>Hedyotis coriacea</i>	E	05/24/91	56 FR 23842	05/15/92	57 FR 20772
<i>Hedyotis mannii</i>	E	09/20/91	56 FR 47718	10/08/92	57 FR 46325
<i>Hesperomannia arborescens</i>	E	10/14/92	57 FR 47028	03/28/94	59 FR 14482
<i>Hesperomannia arbuscula</i>	E	09/28/90	55 FR 39664	10/29/91	56 FR 55770
<i>Hibiscus brackenridgei</i>	E	09/14/93	58 FR 48012	11/10/94	59 FR 56333
<i>Ischaemum byrone</i>	E	12/17/92	57 FR 59951	03/04/94	59 FR 10305
<i>Kanaloa kahoolawensis</i>	E	05/15/97	62 FR 26757	09/03/99	64 FR 48307
<i>Lipochaeta kamolensis</i>	E	05/24/91	56 FR 23842	05/15/92	57 FR 20772
<i>Lysimachia lydgatei</i>	E	05/24/91	56 FR 23842	05/15/92	57 FR 20772
<i>Mariscus pennatiformis</i>	E	09/14/93	58 FR 48012	11/10/94	59 FR 56333
<i>Melicope adscendens</i>	E	05/11/93	58 FR 18073	12/05/94	59 FR 62346
<i>Melicope balloui</i>	E	05/11/93	58 FR 18073	12/05/94	59 FR 62346
<i>Melicope knudsenii</i>	E	10/30/91	56 FR 5562	02/25/94	59 FR 09304
<i>Melicope mucronulata</i>	E	05/24/91	56 FR 23842	05/15/92	57 FR 20772
<i>Melicope ovalis</i>	E	05/11/93	58 FR 18073	12/05/94	59 FR 62346
<i>Neraudia sericea</i>	E	09/14/93	58 FR 48012	11/10/94	59 FR 56333
<i>Peucedanum sandwicense</i>	T	10/30/91	56 FR 5562	02/25/94	59 FR 09304
<i>Phlegmariurus mannii</i>	E	05/24/91	56 FR 23842	05/15/92	57 FR 20772
<i>Phyllostegia mollis</i>	E	09/28/90	55 FR 39664	10/29/91	56 FR 55770
<i>Plantago princeps</i>	E	09/14/93	58 FR 48012	11/10/94	59 FR 56333
<i>Platanthera holochila</i>	E	10/02/95	60 FR 51417	10/10/96	61 FR 53108
<i>Pteris lidgatei</i>	E	06/24/93	58 FR 34231	09/09/94	59 FR 49025
<i>Remya mauiensis</i>	E	10/02/89	54 FR 40447	01/14/91	56 FR 1450
<i>Sanicula purpurea</i>	E	10/02/95	60 FR 51417	10/10/96	61 FR 53108
<i>Schiedea haleakalensis</i>	E	05/24/91	56 FR 23842	05/15/92	57 FR 20772
<i>Sesbania tomentosa</i>	E	09/14/93	58 FR 48012	11/10/94	59 FR 56333
<i>Spermolepis hawaiiensis</i>	E	09/14/93	58 FR 48012	11/10/94	59 FR 56333
<i>Tetramolopium capillare</i>	E	03/25/93	58 FR 16164	09/30/94	59 FR 49860
<i>Vigna o-wahuensis</i>	E	09/14/93	58 FR 48012	11/10/94	59 FR 56333
<i>Zanthoxylum hawaiiense</i>	E	12/17/92	57 FR 59951	03/04/94	59 FR 10305

Key:

E=Endangered

T=Threatened

Section 4(a)(3) of the Act, as amended, and implementing regulations (50 CFR 424.12) require that, to the maximum extent prudent and determinable, the Secretary designate critical habitat at the time the species is determined to be endangered or

threatened. Our regulations (50 CFR 424.12(a)(1)) state that designation of critical habitat is not prudent when one or both of the following situations exist: (1) The species is threatened by taking or other human activity, and identification of critical habitat can be

expected to increase the degree of threat to the species, or (2) such designation of critical habitat would not be beneficial to the species. At the time each plant was listed, we determined that designation of critical habitat was prudent for six of these plants

(*Clermontia samuelii*, *Cyanea copelandii* ssp. *haleakalaensis*, *Cyanea glabra*, *Cyanea hamatiflora* ssp. *hamatiflora*, *Dubautia plantaginea* ssp. *humilis*, and *Kanaloa kahoolawensis*) and not prudent for the other 49 plants because it would not benefit the plant and/or would increase the degree of threat to the species.

The not prudent determinations 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 49 of these 55 species. Among other things, the court held that in most cases we did not sufficiently demonstrate that the species are threatened by human activity or that such threats would increase with the designation of critical habitat. *Id.* At 1283–85. The court also held that we failed to balance any risks of designating critical habitat against any benefits. *Id.* For example, the court suggested that, before concluding critical habitat would not be prudent, the Service should consider whether designation might prevent an inadvertent act of destruction by educating the public.

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

At the time we listed *Clermontia samuelii*, *Cyanea copelandii* ssp. *haleakalaensis*, *Cyanea glabra*, *Cyanea hamatiflora* ssp. *hamatiflora*, *Dubautia plantaginea* ssp. *humilis*, and *Kanaloa kahoolawensis* (64 FR 48307) we determined that designation of critical habitat was prudent and that we would develop critical habitat designations for these six taxa, along with four others, at the same time we developed designations for the 245 Hawaiian plant species. This timetable was challenged in *Conservation Council for Hawaii v. Babbitt*, Civ. No. 99–00283 HG (D. Haw. Aug. 19, 1999, Feb. 16, 2000, and March 28, 2000). The court agreed, however, that it was reasonable for us to integrate these ten Maui Nui (Maui, Lanai, Molokai, and Kahoolawe) plant taxa into the schedule established for designating critical habitat for the other 245 Hawaiian plants, and ordered us to publish proposed critical habitat designations for the ten Maui Nui species by November 30, 2000, and to publish final critical habitat designations by November 30, 2001.

This notice responds to the court orders. On November 30, 1998, we published a notice in the **Federal Register** requesting public comments on our reevaluation of whether designation of critical habitat is prudent for the 245 Hawaiian plants at issue (63 FR 65805). The comment period closed on March 1, 1999, and was reopened from March 24, 1999, to May 24, 1999 (64 FR 14209). We received over 100 responses from individuals, non-profit organizations, the State of Hawaii's Division of Forestry and Wildlife, 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 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, chill 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 suggest, 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 December 29, 1999, we mailed letters to over 130 landowners on the islands of Maui and Kahoolawe requesting any information considered germane to the management of any of the 245 plants on his/her property, and containing a copy of the November 30, 1998, **Federal Register** notice, a map showing the general locations of the plants that may be on his/her property, and a handout containing general information on critical habitat. We received 20 written responses to our landowner mailing with varying types of information on their current land management activities. These responses included information on the following: fencing; weeding; access to hunters or limited hunting; ungulate control; scientific research; fire control; and propagation and/or planting of native plants. We held two open houses on the island of Maui, at the Lahaina Civic Center and the Wailuku Community Center, on January 11 and 12, 2000, respectively, to meet one-on-one with local landowners and other interested members of the public. A total of 30 people attended the two open houses.

On November 7, 2000, we published the first of the court-ordered prudency determinations and proposed critical habitat designations or non-designations for Kauai and Niihau plants (65 FR 66808). In that proposal, we determined that critical habitat was prudent for eleven species (*Alectryon macrococcus*, *Bonamia menziesii*, *Centaurium sebaeoides*, *Flueggea neowawraea*, *Melicope knudsenii*, *Peucedanum sandwicense*, *Plantago princeps*, *Platanthera holochila*, *Sesbania tomentosa*, *Spermolepis hawaiiensis*, and *Zanthoxylum hawaiiense*) from Kauai and/or Niihau that also occur on Maui and/or Kahoolawe.

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. In our regulations at 50 CFR 402.02, we define destruction or adverse modification as " * * * the direct or indirect alteration that appreciably diminishes the value of critical habitat for both the survival and recovery of a listed species. Such alterations include, but are not limited to, alterations adversely modifying any of those physical or biological features that were the basis for determining the habitat to be critical." 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 protections under the Act against such activities.

In order to be included in a critical habitat designation, the habitat must first be "essential to the conservation of the species." Critical habitat designations identify, to the extent known using the best scientific and commercial data available, habitat areas that provide essential life cycle needs of the species (i.e., areas on which are found the primary constituent elements, as defined at 50 CFR 424.12(b)).

Section 4 requires that we designate critical habitat at the time of listing and based on what we know at the time of the designation. When we designate critical habitat at the time of listing or under short court-ordered deadlines, we will often not have sufficient information to identify all areas of critical habitat. We are required, nevertheless, to make a decision and thus must base our designations on

what, at the time of designation, we know to be critical habitat.

Within the geographic area occupied by the species, we will designate only areas currently known to be essential. Essential areas should already have the features and habitat characteristics that are necessary to sustain the species. We will not speculate about what areas might be found to be essential if better information became available, or what areas may become essential over time. If the information available at the time of designation does not show that an area provides essential life cycle needs of the species, then the area should not be included in the critical habitat designation. Within the geographic area occupied by the species, we will not designate areas that do not now have the primary constituent elements, as defined at 50 CFR 424.12(b), that provide essential life cycle needs of the species.

Our regulations 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." (50 CFR 424.12(e)). Accordingly, when the best available scientific and commercial data do not demonstrate that the conservation needs of the species require designation of critical habitat outside of occupied areas, we will not designate critical habitat in areas outside the geographic area occupied by the species.

The Service's Policy on Information Standards Under the Endangered Species Act, published in the **Federal Register** on July 1, 1994 (Vol. 59, p. 34271), provides criteria, establishes procedures, and provides guidance to ensure that decisions made by the Service represent the best scientific and commercial data available. It requires Service biologists, to the extent consistent with the Act and with the use of the best scientific and commercial data available, to 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 package 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 (i.e., gray literature).

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, all should understand that 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) and to the regulatory protections afforded by the section 7(a)(2) jeopardy standard and the Section 9 take prohibition, as determined on the basis of the best available information at the time of the action. We specifically anticipate that 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, or other species conservation planning efforts if new information available to these planning efforts calls for a different outcome.

A. Prudency Redetermination

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

To determine whether critical habitat would be prudent for each of the 38 species discussed in this rule 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. One species, *Acaena exigua*, known only from Kauai and Maui, is no longer extant in the wild. On Kauai, this species was only known from a collection by Heinrich Wawra between 1869–1870 (Wagner *et al.* 1999). *Acaena exigua* was last collected on West Maui between April 22–24, 1997; however, no individuals were seen in two subsequent visits (1998 and 1999) to the only known location (H. Oppenheimer and S. Perlman, pers. comm. 2000). In addition, this species is not known to be in storage or under propagation. Therefore, we believe this species may be extinct. Under these circumstances,

we propose that designation of critical habitat for *Acaena exigua* 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 424.12(f).

Due to low numbers of individuals and/or populations and their inherent immobility, the other 37 plants may be vulnerable to unrestricted collection, vandalism or disturbance. However, 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 that 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 37 species, there would be some benefits to critical habitat. The primary regulatory effect of critical habitat is the section 7 requirement that Federal agencies refrain from taking any action that destroys or adversely affects critical habitat. At least fourteen of these species are reported from federally owned lands (*Argyroxiphium sandwicense* ssp. *macrocephalum*, *Bidens micrantha* ssp. *kalealaha*, *Clermontia samuelii*, *Cyanea copelandii* ssp. *haleakalaensis*, *Cyanea hamatiflora* ssp. *hamatiflora*, *Geranium arboreum*, *Geranium multiflorum*, *Melicope balloui*, *Melicope ovalis*, *Plantago princeps*, and *Schiedea haleakalaensis*) or lands under Federal jurisdiction (*Sesbania tomentosa*), or lands subject to federally funded actions such as the clearing of military ordnance on Kahoolawe (*Kanaloa kahoolawensis*, *Sesbania tomentosa*, and *Vigna owahuensis*) (see Table 3), where most actions would be subject to section 7. While a majority of these 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 not be likely to change the section 7 consultation outcome because 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.

Therefore, we propose that critical habitat is prudent for 37 plant species: *Argyroxiphium sandwicense* ssp. *macrocephalum*, *Bidens micrantha* ssp. *kalealaha*, *Cenchrus agrimonoides*, *Clermontia lindseyana*, *Clermontia oblongifolia* ssp. *mauiensis*, *Colubrina oppositifolia*, *Ctenitis squamigera*, *Cyanea grimesiana* ssp. *grimesiana*, *Cyanea lobata*, *Cyanea mceldowneyi*, *Cyrtandra munroi*, *Diellia erecta*, *Diplazium molokaiense*, *Geranium arboreum*, *Geranium multiflorum*, *Hedyotis coriacea*, *Hedyotis mannii*, *Hesperomannia arborescens*, *Hesperomannia arbuscula*, *Hibiscus brackenridgei*, *Ischaemum byrone*, *Lipochaeta kamolensis*, *Lysimachia lydgatei*, *Mariscus pennatiformis*, *Melicope adscendens*, *Melicope balloui*, *Melicope mucronulata*, *Melicope ovalis*, *Neraudia sericea*, *Phlegmariurus mannii*, *Phyllostegia mollis*, *Pteris lidgatei*, *Remya mauiensis*, *Sanicula purpurea*, *Schiedea haleakalaensis*, *Tetramolopium capillare*, and *Vigna owahuensis*.

Prudency determinations have previously been made for the other 17 species discussed in this proposed rule. Therefore, a critical habitat designation is prudent for 54 of the 69 plant species historically or currently found on Maui and Kahoolawe.

B. Primary Constituent Elements

In accordance with section 4(b)(2) of the Act and regulations at 50 CFR 424.12, in determining which areas to propose as critical habitat, we are required to base critical habitat determinations on the best scientific and commercial data available and to consider those physical and biological features that are essential to the conservation of the species and that may require special management considerations or protection. Such requirements include, but are not

limited to, space for individual and population growth, and for normal behavior; food, water, air, light, minerals, or other nutritional or physiological requirements; cover or shelter; sites for breeding, reproduction, or rearing of offspring, germination, or seed dispersal; and habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of a species.

As described above in the discussion for each of the 54 species, very little is known about the specific physical and biological requirements of these species. The recovery plans that have been published for many of these species generally discuss management practices that are needed for the conservation of these species (e.g., rodent, invasive species, and ungulate control), as oppose to identifying essential areas need by the species. As a result, 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 currently found, including the type of plant community and their physical location (e.g., steep rocky cliffs, talus slopes, stream banks) and elevation. Therefore, the descriptions of the physical elements of the locations of each of these species and the plant community associated with the species, as described in the **Discussion of the Plant Taxa** section above, constitute the primary constituent elements for these species.

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

Critical habitat is defined as the specific areas within the geographic area occupied by the species, at the time it is listed in accordance with the provisions of section 4 of the Act, on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection (16 U.S.C. 1532(5)(A)(i)). As discussed above, although we have published recovery plans for most of these species, very little is known about the specific physical and biological requirements of most of these 54 species. However, given that all of these species are either threatened or endangered with extinction, we feel that all existing sites where these plants occur needs to be designated. Therefore, we have defined primary constituent elements based on the general habitat features of the areas in which they currently occur, such as the type of plant community the plants are growing in, their physical location (e.g., steep rocky cliffs, talus slopes,

stream banks), and elevation. The areas we are proposing to designate as critical habitat provide some or all of the habitat components essential for the conservation of the 54 plant species.

Critical habitat may also include areas outside the geographic area presently occupied by a species upon a determination that such areas are essential to the conservation of the species (16 U.S.C. 1532(5)(A)(ii)). This may include, for example, potentially suitable unoccupied habitat that is important to the recovery of the species. However, we have not included such areas in the proposed designations for these 54 species because of our limited knowledge of the historical range (the geographical area outside the area presently occupied by the species), and our lack of more detailed information on the specific physical or biological features essential for the conservation of the species that would be needed, for instance, to determine where to reintroduce a species.

The historical (pre-1970) or even post-1970 records for a species may be based on herbarium specimens that contain only the most rudimentary collection information, such as only the name of the island from which the specimen was collected or a general place name (e.g., west Maui, Haleakala, above Lahaina). In the main Hawaiian Islands, climatic and ecological conditions such as rainfall, elevation, slope, and aspect, may vary dramatically within a relatively short distance. Therefore, a simple place name does not provide adequate information on the physical and biological features that may have occurred there or may occur there now.

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

The Service considers reintroduction (the planting of propagated individuals or seedlings into an area) to be an acceptable method to try to achieve plant species recovery. However, native plant reintroductions are difficult, and successful efforts are not common. We do not know enough about these 54 species to identify areas where reintroductions are likely to be

successful. We will continue to support experimental efforts to reintroduce species that may eventually provide us with additional information on the physical and biological features essential to the conservation of these species, and thus, may eventually result in identification of unoccupied habitat for future revisions of the appropriate designations.

As required by the Act and regulations (section 4(b)(2) and 50 CFR 424.12), we used the best scientific information available to determine areas that contain those physical and biological features that are essential for the survival and recovery of the 54 plant species. This information included site-specific species information from the Hawaii Natural Heritage Program (HINHP) and our rare plant database, species information from the Center for Plant Conservation's (CPC) rare plant monitoring database housed at the University of Hawaii's Lyon Arboretum, recent biological surveys and reports, our recovery plans for 48 of these 54 species, discussions with botanical experts, and recommendations (see below) from the Hawaii and Pacific Plant Recovery Coordinating Committee (HPPRCC) (USFWS 1995a, 1995b, 1995c, 1996, 1997, 1998a, 1998b, 1999; HPPRCC 1998; HINHP Database 2000; S. Perlman, pers. comm. 2000; R. Hobdy, pers. comm. 2000; CPC *in litt.* 1999).

In 1994, the HPPRCC initiated an effort to identify and map habitat 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* (USFWS 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 findings may also lead to additional refinements (HPPRCC 1998). Because the HPPRCC identified essential habitat areas for all listed, proposed, and candidate plant species and evaluated species of concern to determine if essential habitat areas would provide for their habitat needs as well, the HPPRCC's mapping of habitat is distinct from the regulatory designation of critical habitat, as defined by the Act. While these habitat maps are a planning tool to focus conservation efforts on the areas that may be most important to the conservation of Hawaii's listed plant species, as well as other plant species of concern, it does not substitute for the more exacting regulatory process of designating critical habitat. Therefore,

the proposed critical habitat designations in this proposed rule do not include all of the habitat, in particular unoccupied habitat, identified by the HPPRCC.

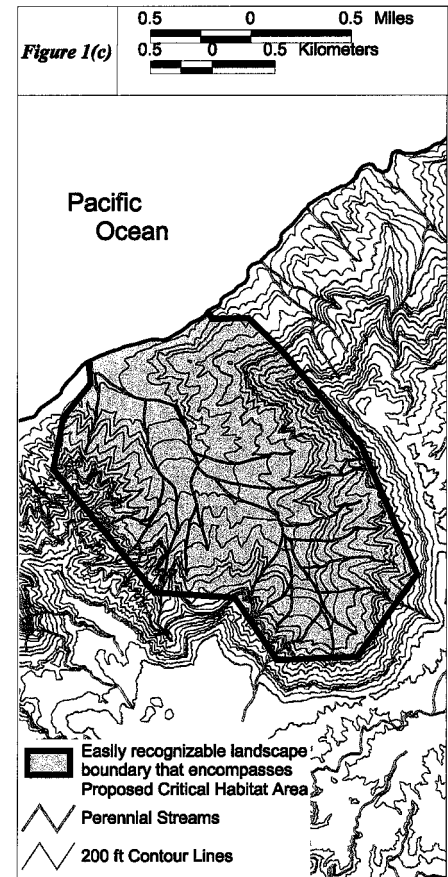
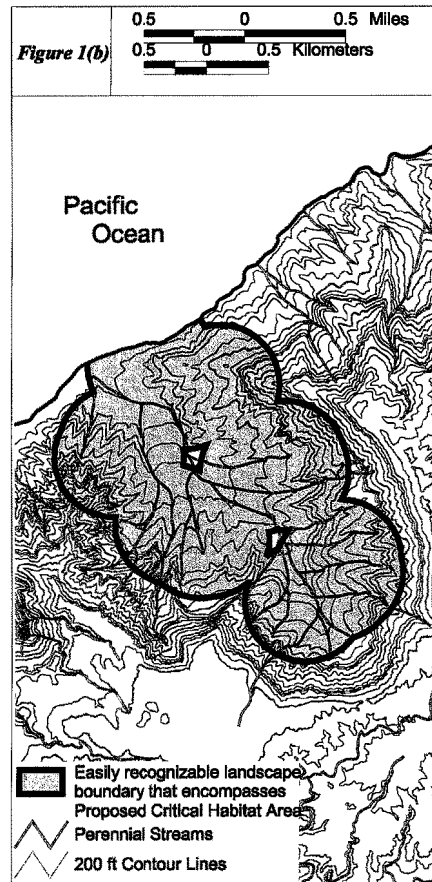
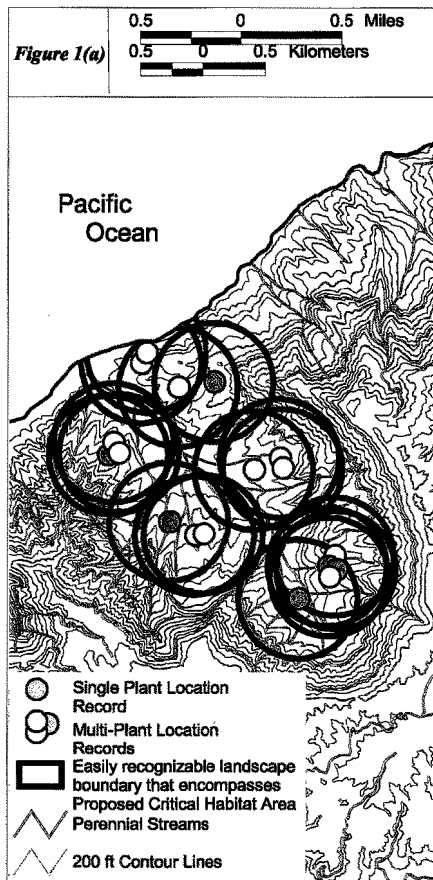
For these 54 plant species from Maui and Kahoolawe, currently occupied habitat was examined and critical habitat boundaries were delineated as multi-species units in such a way that locations with a high density of endangered plants could be depicted clearly. However, these multi-species critical habitat units were not homogenous or uniform in nature. Critical habitat units often encompassed a number of plant community types.

When developing critical habitat units, every current (post-1970) location of every plant specimen was delineated within a 586 m (1,924 ft) radius circle, in order to insure enough area to provide for the proper ecological functioning of the habitat immediately supporting the plant. Due to inaccuracies in mapping locations, it has been determined that the actual location of the plant specimen is within 536 m (1,760 ft) of the center of the delineated circle. The 536 m (1,760 ft) distance is consistent with standard mapping methodology for rare species used by the HINHP (1996). An additional 50 m (164 ft) included in the delineated circle to be consistent with the guidelines identified in the recovery plans for these species for minimum-sized enclosures for rare plants (USFWS 1994, 1995, 1996, 1998a, 1998b, 1999). In cases of isolated species' locations, an area with a radius of roughly 586 m (1,924 ft) is proposed as critical habitat (HINHP 1996; USFWS 1994, 1995, 1996, 1998a, 1998b, 1999).

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

- Known current locations of each species were delineated using the guidelines explained above (Figure 1(a)).
 - The perimeter boundaries of individual circular areas were connected to form unit area boundaries (Figure 1(b)).
 - Unit area boundaries were delineated to follow significant topographic features (50 CFR 424.12(c)) such as coastlines, ridgelines, and valleys (Figure 1(c)).
- This delineation method was used to facilitate identification of boundary lines and to aid in implementation of on-the-ground conservation measures. When delineating critical habitat units, we made an effort to avoid developed areas such as towns, agricultural lands, and other lands unlikely to contribute to the conservation of the 54 species.

Existing features and structures within proposed areas, such as buildings, roads, aqueducts, telecommunications equipment, arboreta and gardens, heiaus (indigenous place of worship, shrine), and other man-made features, do not contain, and are not likely to develop, constituent elements. Therefore, these features or structures would not be included in the critical habitat designation.



All currently occupied sites containing one or more of the primary constituent elements were first evaluated to determine if the site was essential to the conservation of the listed plant species. If the site was considered essential to the conservation of any of these 54 plant species, the site was then examined to determine if additional special management considerations or protection is 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; State of Hawaii, Division of Forestry and Wildlife (DOFAW) planning documents; internal letters and memos; biological assessments and environmental impact statements; and section 7 consultations. Additionally, each public (i.e., county, state, or Federal government holdings) and private landowner on Maui and Kahoolawe with a known occurrence of one of the 54 species was contacted by mail. We reviewed all information received during the public comment period held in response to our landowner mailing and open houses held on Maui on January 11 and 12, 2000. When clarification was required

on the information provided to us, we followed up with a telephone contact. Lastly, because of the large amount of land on Maui under State of Hawaii jurisdiction, we met with staff from the Maui DOFAW office to discuss their current management for the plants on their lands. In addition, we contacted the State's Department of Hawaiian Home Lands regarding management for the plants on lands under their jurisdiction.

Pursuant to the definition of critical habitat, an area must also require "special management considerations or protections." This is a term that originates in the definition of critical habitat in section 3 of the Act. Adequate special management or protection is provided by a legally operative plan that addresses the maintenance and improvement of the essential elements and manages for the long-term conservation of the species. The Service considers a plan adequate when it meets all of the following three criteria: (1) The plan 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) the plan 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) the plan 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.

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

- The factors that led to the listing of the species, as described in the final rules for listing each of the species. For all or nearly all endangered and threatened plants in Hawaii, the major threats include adverse impacts due to nonnative plant and animal species. Direct browsing, digging, and trampling by ungulates, including pigs, goats, cattle, sheep, and deer, and direct competition from nonnative plants have led to the decline of Hawaii's native flora (Smith 1985; Stone 1985; Wagner *et al.* 1985; Scott *et al.* 1986; Cuddihy and Stone 1990; Vitousek 1992; USFWS

1995, 1996a, 1996b, 1997, 1998, 1999; Loope *in Mack et al.* 1998). Ungulate activity in most areas results in an increase of nonnative plants because most of these nonnative plants are able to colonize newly disturbed areas more quickly and effectively than Hawaii's native plants (Cuddihy and Stone 1990; Mack 1992; Scott *et al.* 1986; Smith 1985; Tunison *et al.* 1992; USFWS 1995, 1996a, 1996b, 1997, 1998, 1999).

- The recommendations from the HPPRCC in their 1998 report to the Service ("Habitat Essential to the Recovery of Hawaiian Plants"). As summarized in this report, recovery goals for endangered Hawaiian plant species cannot be achieved with ungulates (e.g., pigs, goats, deer, and sheep) present in Essential Habitat Areas.

- The management actions needed for assurance of survival and ultimate recovery of Hawaii's endangered plants. These actions are described in the Service's recovery plans for 48 of the 54 species (USFWS 1995a, 1995b, 1995c, 1996, 1997, 1998a, 1998b, 1999), in the 1998 HPPRCC report to the Service (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) nonnative plant control; (3) rodent control; (4) invertebrate pest control; (5) fire control; (6) maintenance of genetic material of the endangered and threatened plants species; (7) propagation, reintroduction, and/or augmentation of existing populations into areas deemed essential for the recovery of these species; (8) ongoing management of the wild, outplanted, and augmented populations; and (9) habitat management and restoration in areas deemed essential for the recovery of these species.

In general, taking all of the above recommended management actions into account, the following management actions are ranked in order of importance. It should be noted, however, that, on a case-by-case basis, some of these actions may rise to a higher level of importance for a particular species or area, depending on the biological and physical requirements of the species and the location(s) of the individual plants:

- Feral ungulate control;
- Nonnative plant control;
- Rodent control;
- Invertebrate pest control;
- Fire control;

- Maintenance of genetic material of the endangered and threatened plant species;

- Propagation; reintroduction and/or augmentation of existing populations into areas deemed essential for the recovery of the species;

- Ongoing management of the wild, outplanted and augmented populations;

- Maintenance of natural pollinators and pollinating systems, when known;

- Habitat management and restoration in areas deemed essential for the recovery of the species;

- Monitoring of the wild, outplanted and augmented populations;

- Rare plant surveys; and

- Control of human activities/access.

As shown in Table 3, these 54 species of plants occur on Federal, State, and private lands on the islands of Maui and Kahoolawe. In response to our two public notices, letters to the landowners, open houses, and meetings, along with information in our files, we received varying amounts and various types of information on the conservation management actions occurring on these lands. Some landowners reported that they are not conducting conservation management actions on their lands while others provided information on various activities such as fencing, weeding, ungulate control, control of human access, scientific research, fire control, and propagation and/or planting of native plants.

Contractors for the U.S. Navy are clearing the state-owned island of Kahoolawe of military ordnance utilizing Congressional funding that expires in 2003. The Navy has consulted with the Service under section 7 of the Endangered Species Act, as amended, to ensure protection of threatened and endangered species during the clearance activities. In June 1998, the State of Hawaii Kahoolawe Island Reserve Commission developed an environmental restoration plan for Kahoolawe (Social Science Research Institute, University of Hawaii 1998). The plan, however, does not address specific management actions to protect and conserve endangered plant species. While the island is isolated and remote, and access is restricted due to the presence of unexploded ordnance hazards, this action alone is not sufficient to indicate that additional special management is not required for the listed plant species, and areas on the island are included within the proposed critical habitat units for *Kanaloa kahoolawensis*, *Sesbania tomentosa*, and *Vigna o-wahuensis*.

Protective fencing and monitoring of the endangered plant *Sesbania tomentosa* on the leased U.S. military

lands (Hawaii Army National Guard) at Kanaio Training Area, Maui, were initially funded in 1998. Since then, however, these management activities for *Sesbania tomentosa* have been curtailed due to a lack of funding (Lt. Col. Richard Young, Hawaii Army National Guard, *in litt.* 2000). Therefore, this area has been included within the proposed critical habitat units.

Eleven species (*Argyroxiphium sandwicense* ssp. *macrocephalum*, *Bidens micrantha* ssp. *kalealaha*, *Clermontia samuelii*, *Cyanea copelandii* ssp. *haleakalaensis*, *Cyanea hamatiflora* ssp. *hamatiflora*, *Geranium arboreum*, *Geranium multiflorum*, *Melicope balloui*, *Melicope ovalis*, *Plantago princeps*, and *Schiedea haleakalaensis*) are reported from U.S. National Park lands at Haleakala National Park, Maui (GDSI 2000; HINHP 2000). Two of these species, *Melicope ovalis* and *Schiedea haleakalaensis*, are currently only found in Haleakala National Park.

Haleakala National Park was established by Congress in 1916 as the Haleakala Section of Hawaii National Park. In 1960, an Act of Congress established Haleakala as an independent unit of the National Park System to preserve for visitor enjoyment and scientific study the outstanding scenic, geological, and biological resources and the natural environment of Haleakala Crater (Resources Management Division 1999). Management programs, objectives, and their implementation schedules are documented in the Park's 1999 draft *Resources Management Plan* (Resources Management Division 1999). This plan details the management issues and strategies used by the Park to protect, restore, and enhance the rare and native plants and their habitats within the park (Resources Management Division 1999). These management strategies address factors which led to the listing of the 11 species including control of, or research on, nonnative species of ungulates, rodents, invertebrates, and weeds. Management strategies for control of fire within the Park are outlined in their fire management plan (Resources Management Division 1999). In addition, habitat restoration, including propagation and outplanting of native and endangered plants, and monitoring are also included in this plan. Because the *Resources Management Plan* and the park's fire management plan provides conservation benefits to the listed species within the park and provides assurances that the plan will be effective and will continue to be implemented, these lands are not in need of special management considerations or protection. Therefore, we have

determined that the Federal lands within Haleakala National Park do not meet the definition of critical habitat in the Act, and we are not proposing designation of these lands as critical habitat.

Twelve species (*Alectryon macrococcus*, *Argyroxiphium sandwicense* ssp. *macrocephalum*, *Bonania menziesii*, *Colubrina oppositifolia*, *Ctenitis squamigera*, *Diplazium molokaiense*, *Geranium arboreum*, *Geranium multiflorum*, *Melicope balloui*, *Plantago princeps*, *Platanthera holochila*, and *Sanicula purpurea*) are reported from The Nature Conservancy's Waikamoi and Kapunakea Preserves which are located on the northeast slopes of Haleakala and in the West Maui mountains, respectively (The Nature Conservancy of Hawaii (TNCH) 1997, 1998; GDSI 2000; HINHP Database 2000). Both preserves were established by grants of perpetual conservation easements from the private landowners to TNCH and are included in the state's Natural Area Partnership (NAP) program which provides matching funds for the management of private lands that have been permanently dedicated to conservation (TNCH 1997, 1998).

Under the NAP program, the State of Hawaii provides matching funds on a two-for-one basis for management of private lands dedicated to conservation. In order to qualify for this program, the land must be dedicated in perpetuity through transfer of fee title or a conservation easement to the State or a cooperating entity. The land must be managed by the cooperating entity or a qualified landowner according to a detailed management plan approved by the Board of Land and Natural Resources. Once approved, the six-year partnership agreement between the State and the managing entity is automatically renewed each year so that there are always six years remaining in the term, although the management plan is updated and funding amounts are re-authorized by the board at least every six years. By April 1 of any year, the managing partner may notify the state that it does not intend to renew the agreement; however, in such case the partnership agreement remains in effect for the balance of the existing six year term, and the conservation easement remains in full effect in perpetuity. The conservation easement may be revoked by the landowner only if state funding is terminated without the concurrence of the landowner and cooperating entity. Prior to terminating funding, the State must conduct one or more public hearings. The NAP program is funded through real estate conveyance taxes

which are placed in a Natural Area Reserve Fund. Participants in the NAP program must provide annual reports to the Department of Land and Natural Resources (DLNR) and DLNR makes annual inspections of the work in the reserve areas. See Haw. Rev. Stat. §§ 195-1—195-11; Hawaii Administrative Rules § 13-210.

Management programs within the preserves are documented in long-range management plans and yearly operational plans. These plans detail management measures that protect, restore, and enhance the rare plants and their habitats within the preserves and in adjacent areas (TNCH 1997, 1998, 1999). These management measures address factors which led to the listing of the 12 species including control of nonnative species of ungulates, rodents, and weeds. In addition, habitat restoration and monitoring are also included in these plans.

The primary management goals for both Kapunakea and Waikamoi Preserves are to (1) prevent degradation of native forest by reducing feral ungulate damage; (2) improve or maintain the integrity of native ecosystems in selected areas of the preserve by reducing the effects of nonnative plants; (3) increase the understanding of threats posed by small mammals and reduce their negative impact, where possible; (4) prevent extinction of rare species in the preserve; (5) track the biological and physical resources in the preserves and to evaluate changes in these resources over time; (6) identify new threats to the preserves before they become established pests; and (7) build public understanding and support for the preservation of natural areas, and to enlist volunteer assistance for preserve management (TNCH 1997, 1998).

The goal of the ungulate program is to bring pig populations to zero as rapidly as possible. Specific management actions to address feral ungulate impacts include the construction of fences, including strategic fencing (fences placed in proximity to natural barriers such as cliffs), annual monitoring of ungulate presence transects, and trained staff and volunteer hunting. Since axis deer may also pose a threat to the preserves, TNCH is a member of the Maui Axis Deer Group (MADG) and staff meet regularly with other MADG members to seek solutions. In Waikamoi Preserve, the management actions also include working with community hunters in conjunction with the East Maui Watershed Partnership (EMWP). In Kapunakea Preserve, a system of transects extend the length of the

preserve to monitor resource threats, including ungulate presence. By monitoring ungulate activity within the preserve, the staff is able to assess the success of the hunting program. If increased hunting pressure does not reduce feral ungulate activity in the preserves, the preserve staff work with the hunting group to identify and implement alternative methods (TNCH 1997, 1998).

The nonnative plant control program within both preserves focuses on controlling habitat modifying nonnative plants (weeds) in intact native communities and preventing the introduction of additional alien plants. Based on the degree of threat to native ecosystems, a weed priority list has been compiled for the preserves, and control and monitoring of the highest priority species are on-going. Weeds are controlled manually, chemically, or a through a combination of both. Preventative measures (prevention protocol) are required by all (volunteers, riders, and hiking participants) who enter the preserves. This protocol includes such things as brushing footwear before entering the preserves to remove seeds of nonnative plants. Weeds are monitored along transects annually, weed priority maps are maintained, staff participate as members of the Melastome Action Committee and the Maui Invasive Species Committee (MISC), and cooperate with the Division of Conservation and Resources Enforcement (DOCARE) in marijuana control, as needed.

The effects of nonnative invertebrates and small mammals on native Hawaiian ecosystems is poorly understood. Initial control measures such as anti-coagulant diphacinone bait stations are being used to control rats in areas of suspected impact; however, valid conclusions from data gathered have not been drawn. Adaptive management will be applied when new information becomes available (TNCH 1997, 1998).

Natural resource monitoring and research address the need to track the biological and physical resources of the preserves and evaluate changes in these resources to guide management programs. Vegetation is monitored throughout the preserves to document long term ecological changes, and rare plant species are monitored to assess population status. Cuttings of endangered plants are taken to the University of Hawaii's tissue culture lab at Lyon Arboretum for propagation. In addition, the preserve staff provides logistical support to scientists and others who are conducting research within the preserves.

Kapunakea Preserve is adjacent to two areas that are also managed to protect natural resources: Puu Kukui Watershed Management Area (WMA) and the Honokawai section of the state West Maui NAR. The Conservancy currently acts as a consultant to Maui Land and Pineapple Co., managers of Puu Kukui WMA, and has a Master Cooperative Agreement with the state DOFAW. These agreements are used to coordinate management and sharing of staff and equipment, and expertise to maximize management efficiency.

Waikamoi Preserve is adjacent to three other large areas that are also managed to protect natural resources: Haleakala National Park, the state's Koolau Forest Reserve, and the state Hanawi NAR. An agreement between the Division of Land and Natural Resources (DLNR), East Maui Irrigation Co., Keola Hana Maui Inc., Haleakala Ranch Company, County of Maui, The Nature Conservancy, and Haleakala National Park implementing a joint management plan (East Maui Watershed Partnership Plan) for the entire East Maui Watershed. Management efforts at Waikamoi will, as much as possible, complement the objectives of the plan. The partnership agreement will be used to coordinate management and sharing of staff and equipment, and expertise to maximize management efficiency (TNCH 1998).

Because the preserves and the continuing management plans being implemented for these plants and their habitats within the preserves provided a conservation benefit to the species and are permanently protected and managed, these lands meet the three criteria for determining that an area is not in need of special management. Therefore, we have determined that the private lands within Waikamoi Preserve and Kapunakea Preserve do not meet the definition of critical habitat in the Act, and we are not proposing designation of these lands as critical habitat. Should the status of any of these reserves change, for example by non-renewal of a partnership agreement or termination of NAP funding, we will reconsider whether it then meets the definition of critical habitat. If so, we have the authority to propose to amend critical habitat to include such area at that time. 50 CFR 424.12(g).

Seven species (*Ctenitis squamigera*, *Clermontia oblongifolia* ssp. *mauiensis*, *Cyanea lobata*, *Hesperomannia arbuscula*, *Phlegmariurus manni*, *Pteris lidgatei*, and *Sanicula purpurea*) are reported from the Maui Pineapple Company's Puu Kukui Watershed Management Area (Puu Kukui WMA), located in the West Maui mountains

(GDSI 2000; HINHP Database 2000; Maui Land and Pineapple Co., Ltd. undated). At just over 8,600 acres, the Puu Kukui WMA is the largest privately-owned preserve in the State. In 1993, the Puu Kukui WMA became the first private landowner participant in the Natural Areas Partnership program. In the sixth fiscal year (1999) of the Natural Area Partnership program with the Hawaii Department of Land and Natural Resources, Puu Kukui Watershed Management Area staff is pursuing four management programs stipulated in their Long Range Management Plan with an emphasis on reducing nonnative species that immediately threaten the management area (Maui Pineapple Company 1999).

The primary management goals within Puu Kukui WMA are to (1) eliminate ungulate activity in all Puu Kukui management units; (2) reduce the range of habitat-modifying weeds and prevent introduction of nonnative plants; (3) reduce the negative impacts of nonnative invertebrates and small animals; (4) monitor and track biological and physical resources in the watershed in order to improve management understanding of the watershed's resources; and (5) prevent the extinction of rare species within the watershed.

Specific management actions to address feral ungulates include the construction of fences surrounding 10 management units, and allowing public hunting with State permit holders within the Puu Kukui WMA.

The nonnative plant control program within Puu Kukui WMA focuses on habitat modifying nonnative plants (weeds), prioritizing them according to the degree of threat to native ecosystems, and preventing the introduction of new weeds. The weed control program includes mapping and monitoring along established transects, and manual/mechanical control. Biological control of the melastome plant, *Clidemia hirta* was tried by releasing *Antiblemma acclinalis* moth larvae.

Natural resource monitoring and research address the need to track biological and physical resources of the Puu Kukui WMA and evaluate changes to these resources in order to guide management programs. Vegetation is monitored through permanent photo points, alien species are monitored along permanent transects, and rare, endemic, and indigenous species are monitored. Additionally, logistical and other support for approved research projects, interagency cooperative agreements, remote survey trips within the watershed are provided.

The management of Puu Kukui WMA meets the three criteria for determining that an area is not in need of special management (see above). Therefore, we have determined that the private land within Puu Kukui WMA does not meet the definition of critical habitat in the Act, and we are not proposing designation of this land as critical habitat. Should the status of this reserve change, for example by non-renewal of a partnership agreement or termination of NAP funding, we will reconsider whether it then meets the definition of critical habitat. If so, we have the authority to propose to amend critical habitat to include such area at that time. 50 CFR 424.12(g).

Two plant species, *Geranium multiflorum* and *Clermontia samuelii* ssp. *hanaensis*, are reported from the upper areas of Hanawi Natural Area Reserve (HNAR) (GDSI 2000; HINHP Database 2000). The HNAR was established in 1986, and comprises 7,500 acres of diverse native ecosystems and endangered forest bird habitats. Natural Area Reserves are managed by the Department of Land and Natural Resources (DLNR), except that any use must be specifically approved by the Natural Area Reserve System Commission. Natural Area Reserves are held in trust by the State and may not be alienated except upon a finding by the DLNR of an imperative and unavoidable necessity. DLNR must provide public notice and conduct public hearings before revoking or modifying an executive order that sets aside lands for the reserve system (Haw. Rev. Stat. §§ 195-1—195-11). The primary goals of the HNAR are to (1) protect the upper areas of the reserve by fencing smaller manageable units to restrict pig movements; (2) prevent degradation of native forest by reducing feral ungulate damage; and (3) improve or maintain the integrity of native ecosystems in selected areas of the preserve by reducing the effects of nonnative plants.

Specific management actions to address feral ungulate impacts include the construction of fences, including strategic fencing of smaller manageable units, and staff hunting. Currently, the upper 2,000 acres has been fenced and pigs removed. Fences are constructed along the western boundaries of the HNAR, along the 1,585 m (5,200 ft) contour to the east up to the Haleakala National Park boundary on state land. The Haleakala National Park fence serves as the upper fence boundary for HNAR. Additionally, fences have been constructed to separate three distinct management units: Puu Alaea Unit, Pouli Unit, and Kuhiwai/Waialeale

Unit. Since the removal of pigs in these upper forest units of the HNAR, vegetation monitoring has been implemented to determine recovery of native plant species. Currently, a fence is being constructed along the 1,100 m (3,600 ft) contour of the HNAR which will comprise the "middle forest unit" (B. Evanson, pers. comm. 1999).

The nonnative plant control program within HNAR focuses on habitat modifying nonnative plants (weeds). A weed priority list has been compiled for HNAR and control and monitoring of the highest priority species are on going. Weeds are controlled manually, chemically, or through a combination of both. Monitoring transects will help locate developing populations of other priority weed species and, if necessary, removal of these populations will be conducted (DLNR 1989).

Because these plants and their habitats within the upper areas of Hanawi NAR (above 1,525 m (5,000 ft)) are permanently protected and managed and because the continued successful management of this area is assured, this area is not in need of special management considerations or protection. Therefore, we have determined that the State land within the upper areas of Hanawi NAR does not meet the definition of critical habitat in the Act, and we are not proposing designation of this area as critical habitat. Should the status of this reserve change, for example by revocation or modification of the NAR, we will reconsider whether it then meets the definition of critical habitat. If so, we have the authority to propose to amend critical habitat to include such area at that time. 50 CFR 424.12(g).

In summary, we believe that the habitat within Waikamoi and Kapunakea Preserves, Puu Kukui Watershed Management Area, the upper area (above 1,525 m (5,000 ft)) of Hanawi Natural Area Reserve, and Haleakala National Park are being adequately managed for the conservation of the listed species that occur within these areas and are not in need of special management considerations or protection. Therefore, we have determined that these lands do not meet the definition of critical habitat in the Act, and we are not proposing designation of these lands as critical habitat. Four species include in this proposed rule (*Argyroxiphium sandwicense* ssp. *macrocephalum*, *Melicope balloui*, *Melicope ovalis*, and *Schiedea haleakalensis*) are currently only found in Waikamoi Preserve and/or Haleakala National Park. Since these two areas are not in need of special management, critical habitat is not

proposed for these four species. However, we are specifically soliciting comments on the appropriateness of this approach.

As described above, 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 islands of Maui and Kahoolawe. The Service supports these efforts and provides technical assistance whenever possible. In addition, we are soliciting comments in this proposed rule on whether current land management plans or practices applied within the areas proposed as critical habitat adequately address the threats to these listed species. We are also soliciting comments on whether future development and approval of conservation measures (e.g., Conservation Agreements, Safe Harbor Agreements) should trigger revision of proposed critical habitat to exclude such lands and, if so, by what mechanism.

In summary, the proposed critical habitat areas described below constitute our best assessment of the physical and biological features needed for the conservation of the 50 plant species, and are based on the best scientific and commercial information available and described above. We put forward this proposal acknowledging that we have incomplete information regarding many of the primary biological and physical requirements for these species. However, both the Act and the relevant court orders require 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 are shown in Tables 5(a) and 5(b). Proposed critical habitat includes habitat for 50 species predominantly in the upland areas on the eastern and western sides of Maui. Lands proposed as critical habitat have been divided into 52 units on Maui and four units on Kahoolawe. A brief description of each unit is presented below.

TABLE 5(A).—APPROXIMATE PROPOSED CRITICAL HABITAT AREA BY UNIT AND LAND OWNERSHIP OR JURISDICTION, MAUI, MAUI COUNTY, HAWAII

Unit name	County or state	Private	Federal	Total
Maui A	2 ha (5 ac)	47 ha (116 ac)	N/A	49 ha (121 ac)
Maui B	21 ha (52 ac)	46 ha (114 ac)	N/A	67 ha (166 ac)
Maui C	144 ha (357 ac)	0.1 ha (0.3 ac)	N/A	144.1 ha (357.3 ac)
Maui D	36 ha (90 ac)	9 ha (21 ac)	N/A	45 ha (111 ac)
Maui E	34 ha (83 ac)	45 ha (111 ac)	N/A	79 ha (194 ac)
Maui F	N/A	61 ha (150 ac)	N/A	61 ha (150 ac)
Maui G	1 ha (2 ac)	N/A	N/A	1 ha (2 ac)
Maui H	1 ha (2 ac)	41 ha (102 ac)	N/A	42 ha (104 ac)
Maui I	0.1 ha (0.3 ac)	N/A	N/A	0.1 ha (0.3 ac)
Maui J	19 ha (48 ac)	44 ha (109 ac)	N/A	63 ha (157 ac)
Maui K	N/A	61 ha (150 ac)	N/A	61 ha (150 ac)
Maui L	50 ha (124 ac)	N/A	N/A	50 ha (124 ac)
Maui M	0.3 ha (0.7 ac)	14 ha (35 ac)	N/A	14.3 ha (35.7 ac)
Maui N	114 ha (282 ac)	1 ha (2 ac)	N/A	115 ha (284 ac)
Maui O	278 ha (688 ac)	N/A	N/A	278 ha (688 ac)
Maui P	58 ha (144 ac)	N/A	N/A	58 ha (144 ac)
Maui Q	759 ha (1,880 ac)	1,579 ha (3,911 ac)	N/A	2,338 ha (5,791 ac)
Maui R	0.1 ha (0.3 ac)	299 ha (740 ac)	N/A	299.1 ha (740.3 ac)
Maui S	109 ha (270 ac)	34 ha (84 ac)	N/A	143 ha (354 ac)
Maui T	391 ha (968 ac)	189 ha (468 ac)	N/A	580 ha (1,436 ac)
Maui U	104 ha (258 ac)	16 ha (40 ac)	N/A	120 ha (298 ac)
Maui V	N/A	103 ha (255 ac)	N/A	103 ha (255 ac)
Maui W	67 ha (167 ac)	2 ha (5 ac)	N/A	69 ha (172 ac)
Maui X	197 ha (488 ac)	7 ha (17 ac)	N/A	204 ha (505 ac)
Maui Y	107 ha (265 ac)	9 ha (22 ac)	N/A	116 ha (287 ac)
Maui Z	60 ha (148 ac)	55 ha (136 ac)	N/A	115 ha (284 ac)
Maui Aa	74 ha (183 ac)	0.3 ha (0.7 ac)	N/A	74.3 ha (183.7 ac)
Maui Bb	12 ha (30 ac)	340 ha (842 ac)	N/A	352 ha (872 ac)
Maui Cc	N/A	117 ha (290 ac)	N/A	117 ha (290 ac)
Maui Dd	N/A	213 ha (528 ac)	N/A	213 ha (528 ac)
Maui Ee	130 ha (322 ac)	58 ha (144 ac)	N/A	188 ha (466 ac)
Maui Ff	119 ha (295 ac)	N/A	N/A	119 ha (295 ac)
Maui Gg	177 ha (438 ac)	N/A	N/A	177 ha (438 ac)
Maui Hh	117 ha (290 ac)	N/A	N/A	117 ha (290 ac)
Maui Ii	879 ha (2,177 ac)	N/A	N/A	879 ha (2,177 ac)
Maui Jj	93 ha	N/A	N/A	93 ha

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

Unit name	County or state	Private	Federal	Total
Maui Kk	(230 ac) 144 ha	N/A	N/A	(230 ac) 144 ha
Maui Ll	(357 ac) N/A	N/A	N/A	(357 ac) 45 ha
Maui Mm	N/A 133 ha	45 ha (111 ac)	N/A	45 ha (111 ac)
Maui Nn	(329 ac) 510 ha	34 ha (84 ac)	N/A	167 ha (413 ac)
Maui Oo	(1,263 ac) 116 ha	182 ha (451 ac)	N/A	692 ha (1,714 ac)
Maui Pp	(287 ac) 82 ha	N/A	N/A	116 ha (287 ac)
Maui Qq	(203 ac) 973 ha	31 ha (77 ac)	N/A	113 ha (280 ac)
Maui Rr	(2,410 ac) 104 ha	N/A	N/A	973 ha (2,410 ac)
Maui Ss	(258 ac) 1,014 ha	11 ha (27 ac)	N/A	115 ha (285 ac)
Maui Tt	(2,512 ac) 103 ha	910 ha (2,254 ac)	N/A	1,924 ha (4,766 ac)
Maui Uu	(255 ac) 79 ha	11 ha (27 ac)	N/A	114 ha (282 ac)
Maui Vv	(196 ac) 76 ha	42 ha (104 ac)	N/A	121 ha (300 ac)
Maui Ww	(188 ac) 133 ha	1 ha (2 ac)	N/A	77 ha (190 ac)
Maui Xx	(329 ac) 4 ha	N/A	N/A	133 ha (329 ac)
Maui Yy	(10 ac) 29 ha	56 ha (139 ac)	N/A	60 ha (149 ac)
Maui Zz	(72 ac) 118 ha	1,089 ha (2,697 ac)	N/A	1,118 ha (2,769 ac)
	(292 ac)	N/A	N/A	118 ha (292 ac)
Total	7,771.5 ha (19,248.3 ac)	5,802.4 ha (14,366.0 ac)	N/A	13,573.9 ha (33,614.3 ac)

TABLE 5 (B).—APPROXIMATE PROPOSED CRITICAL HABITAT AREA BY UNIT AND LAND OWNERSHIP OR JURISDICTION, KAHOO LAWE, MAUI COUNTY, HAWAII

Unit name	County or state	Private	Federal	Total
Kahoolawe B	38 ha (94 ac)	N/A	N/A	38 ha (94 ac)
Kahoolawe C	50 ha (124 ac)	N/A	N/A	50 ha (124 ac)
Kahoolawe D	114 ha (282 ac)	N/A	N/A	114 ha (282 ac)
Total	207 ha (512 ac)	N/A	N/A	207 ha (512 ac)

Descriptions of Critical Habitat Units

Maui A

The proposed Maui A provides critical habitat for one species: *Sesbania tomentosa*. This unit contains a total of 49 ha (121 ac). The lands contained within this unit are owned by Maui County and a private entity. The natural feature found in this unit is Nakalele Point.

Maui B

The proposed Maui B provides critical habitat for one species: *Sesbania*

tomentosa. This unit contains a total of 67 ha (166 ac). The lands contained within this unit are owned by the State and a private entity. The natural features found in this unit are Keawalua, Corral, Akaluanui, and Akhluai. This area is bound on the north by Poelua Bay.

Maui C

The proposed Maui C provides critical habitat for one species: *Sesbania tomentosa*. This unit contains approximately 144 ha (357 ac). The land contained within this unit is

predominately owned by the State, with a very small portion privately owned. The natural features found in this unit are Mokolea Point, portions of Alapapa Gulch, Papanalahoia Point, and Kaikaina.

Maui D

The proposed Maui D provides critical habitat for two species: *Centaurium sebaeoides* and *Sesbania tomentosa*. This unit contains 45 ha (111 ac). The lands contained within this unit are owned by the State and a private entity. The natural features

found in this unit are Kahakuloa Head, Puu Koaie, and Puu Kahulianapa. This unit is bound on the west by Kahakuloa Bay, on the southwest by Kahakuloa town, and on the east by Mahinanui.

Maui E

The proposed Maui E provides critical habitat for one species: *Centaurium sebaeoides*. This unit contains a total of 79 ha (194 ac). The lands contained within this unit are owned by State and private owners. The natural features found in this unit are portions of Kamakakoale Stream, Lahoole and Waiokila Gulch.

Maui F

The proposed Maui F provides critical habitat for one species: *Centaurium sebaeoides*. This unit contains a total of 61 ha (150 ac). The land contained within this unit is owned solely by a private owner. The natural feature found in this unit is Kupaa Gulch.

Maui G

The proposed Maui G provides critical habitat for two species: *Ischaemum byrone* and *Peucedanum sandwicense*. This unit contains a total of 1 ha (2 ac). The land contained within this unit is owned by the State. This unit is the entire Keopuka Islet.

Maui H

The proposed Maui H provides critical habitat for one species: *Ischaemum byrone*. This unit contains a total of 42 ha (104 ac). The lands contained within this unit are owned by the State and private owners. The natural features found in this unit are Pauwalu Point, Paepaemoana Point, and Waianu.

Maui I

The proposed Maui I provides critical habitat for one species: *Ischaemum byrone*. This unit contains a total of 0.1 ha (0.3 ac). The land contained within this unit is owned by the State. This unit is Moku Huki.

Maui J

The proposed Maui J provides critical habitat for one species: *Mariscus pennatiformis*. This unit contains a total of 63 ha (157 ac). The lands contained within this unit are owned the State and private owners. The natural feature found in this unit is Hanawi Stream.

Maui K

The proposed Maui K provides critical habitat for one species: *Ischaemum byrone*. This unit contains a total of 61 ha (150 ac). The land contained within this unit is owned

solely by private owners. The natural feature found in this unit is Kalahu Point.

Maui L

The proposed Maui L provides critical habitat for one species: *Ischaemum byrone*. This unit contains a total of 50 ha (124 ac). The land contained within this unit is owned by the State. The natural features found in this unit are portions of Keakulikuli Point, Kapukaulua, Pukaulua Point and Waianapanapa Cave. This unit is bound on the east by Keauaiki and Pailoa Bays.

Maui M

The proposed Maui M provides critical habitat for one species: *Ischaemum byrone*. This unit contains a total of 14.3 ha (35.7 ac). The lands contained within this unit are owned by the State and a private owner. The natural feature found in this unit is Kauiki Head.

Maui N

The proposed Maui N provides critical habitat for one species: *Lipochaeta kamolensis*. This unit contains a total of 115 ha (284 ac). The lands contained within this unit are owned by the State and a private owner. The natural feature found in this unit is Kepuni Gulch.

Maui O

The proposed Maui O provides critical habitat for two species: *Bonamia menziesii* and *Hibiscus brackenridgei*. This unit contains a total of 278 ha (688 ac). The land contained within this unit is owned by the State. The natural feature found in this unit is Puu o kali.

Maui P

The proposed Maui P provides critical habitat for one species: *Clermontia oblongifolia* ssp. *mauiensis*. This unit contains a total of 58 ha (144 ac) and is found in the State's Honokowai section of the West Maui NAR and the West Maui Forest Reserve. The land contained within this unit is owned solely by the State. The natural feature found in this unit is a portion of Amalu Stream.

Maui Q

The proposed Maui Q provides critical habitat for 15 species: *Alectryon macrococcus*, *Ctenitis squamigera*, *Cyanea glabra*, *Cyanea grimesiana* ssp. *grimesiana*, *Cyanea lobata*, *Diellia erecta*, *Dubautia plantaginea* ssp. *humilis*, *Hedyotis manni*, *Hesperomannia arbuscula*, *Lysimachia lydgatei*, *Phlegmariurus manni*, *Plantago princeps*, *Pteris lidgatei*,

Sanicula purpurea and *Tetramolopium capillare*. This unit contains a total of 2,338 ha (5,791 ac) and is found in the State's Lihau and Panaewa sections of the West Maui NAR and the West Maui Forest Reserve. The lands contained within this unit are owned by the State and private owners. The natural features found in this unit are portions of Kahoma Stream, Kanaha Stream, Makila Stream, Launiupaku Stream, Kinihapai Stream, Ae Stream, Olowalu Stream, Nukalaloa Stream, and Poohahoahoa Stream; portions of Kahoolewa Ridge; Kauaula; Helu; Launiupoko; Lihau; Olowalu; Halepohaku; Ulaula; portions of Ukumehame Gulch and Stream; Koai; portions of the back of Iao Valley and Stream; the Needle; portions of Kapilau Ridge; Paunau; portions of Waikapu Valley; and Hanaula.

Maui R

The proposed Maui R provides critical habitat for two species: *Hesperomannia arbuscula* and *Sanicula purpurea*. This unit contains a total of 299.1 ha (740.3 ac). The lands contained within this unit are owned by a private owner and the State. The natural feature found in this unit is a portion of Waihee River.

Maui S

The proposed Maui S provides critical habitat for one species: *Sanicula purpurea*. This unit contains a total of 143 ha (354 ac). The lands contained within this unit are owned by the State and a private owner. The natural features found in this unit are Kahakuloa, portions of Kahakuloa Stream and Hulupueo Stream, and Keahikauo.

Maui T

The proposed Maui T provides critical habitat for five species: *Ctenitis squamigera*, *Diellia erecta*, *Neraudia sericea*, *Platanthera holochila*, and *Remya mauiensis*. This unit contains a total of 580 ha (1,436 ac) and is found in the State's West Maui Forest Reserve and Manawainui Plant Sanctuary. The lands contained within this unit are owned by the State and a private owner. The natural features found in this unit are portions of Pohakea Gulch, Kaonehua Gulch, Papalaua Gulch, and Manawainui Gulch; portions of Ukumehame; Hanaulaiki; Polanui; and Puu Anu.

Maui U

The proposed Maui U provides critical habitat for one species: *Spermolepis hawaiiensis*. This unit contains a total of 120 ha (298 ac). The lands contained within this unit are

owned by the State and a private land owner. The natural feature found in this unit is a portion of Kanaha Stream.

Maui V

The proposed Maui V provides critical habitat for one species: *Hibiscus brackenridgei*. This unit contains a total of 103 ha (255 ac). The land contained within this unit are owned solely by private owners. The natural features found in this unit are portions of Kaunoahua ridge, portions of Paleaahu Gulch, and portions of Kaonohua Gulch.

Maui W

The proposed Maui W provides critical habitat for two species: *Phlegmariurus mannii* and *Sanicula purpurea*. This unit contains a total of 69 ha (172 ac) and is found in the State's Kahakuloa section of the West Maui NAR. The lands contained within this unit are owned by the State and a private land owner. The natural features found in this unit are Violet Lake and a portion of Kapuloa Stream.

Maui X

The proposed Maui X provides critical habitat for four species: *Hedyotis coriacea*, *Hibiscus brackenridgei*, *Sesbania tomentosa*, and *Spermolepis hawaiiensis*. This unit contains a total of 204 ha (505 ac) and is found in the State's Lihau section of the West Maui NAR. The lands contained within this unit are owned by the State and a private owner. This unit is bound on the east by Olowalu.

Maui Y

The proposed Maui Y provides critical habitat for one species: *Cyrandra munroi*. This unit contains a total of 116 ha (287 ac) and is found within the State's West Maui Forest Reserve. The lands contained within this unit are owned by the State and a private owner. The natural feature found in this unit is a portion of Makamakaole Stream.

Maui Z

The proposed Maui Z provides critical habitat for one species: *Hesperomannia arborescens*. This unit contains a total of 115 ha (284 ac) and is found within the State's Kahakuloa section of the West Maui NAR and the West Maui Forest Reserve. The lands contained within this unit are owned by the State and a private owner. The natural features found in this unit are portions of Makamakaole Stream, portions of Huluhulupueo Stream, and Lanilili.

Maui Aa

The proposed Maui Aa provides critical habitat for one species: *Pteris lidgatei*. This unit contains a total of 74.3 ha (183.7 ac) and is found within the State's Kahakuloa section of the West Maui NAR. The lands contained within this unit are owned privately and by the State. The natural features found in this unit are Kahakuloa and Honokohau.

Maui Bb

The proposed Maui Bb provides critical habitat for two species: *Cyanea copelandii* ssp. *haleakalaensis* and *Cyanea mceldowneyi*. This unit contains a total of 352 ha (872 ac) and is located within the State's Makawao Forest Reserve. The lands contained within this unit are owned by the State and private owners. The natural features found in this unit are Haiku Uka, portions of Opana Gulch, portions of Kailua Stream, portions of Waiohiwi Gulch, and portions of Waikamoi Stream.

Maui Cc

The proposed unit Maui Cc provides critical habitat for one species: *Cyanea hamatiflora* ssp. *hamatiflora*. This unit contains a total of 117 ha (290 ac). The land contained within this unit is owned solely by a private owner. The natural features found in this unit are portions of Haipuaena Stream and Puohakamoa Stream.

Maui Dd

The proposed Maui Dd provides critical habitat for two species: *Cyanea hamatiflora* ssp. *hamatiflora* and *Cyanea mceldowneyi*. This unit contains a total of 213 ha (528 ac). The land contained within this unit is owned solely by a private land owner. The natural features found in this unit are portions of Puohokamoa Stream and Haipuaena Stream.

Maui Ee

The proposed Maui Ee provides critical habitat for one species: *Geranium multiflorum*. This unit contains a total of 188 ha (466 ac) and is found in the State's Koolau Forest Reserve. The lands contained within this unit are owned by the State and a private owner. The natural feature found in this unit is Puu Alaea.

Maui Ff

The proposed Maui Ff provides critical habitat for one species: *Cyanea hamatiflora* ssp. *hamatiflora*. This unit contains a total of 119 ha (295 ac) and is found in the State's Hanawi NAR and Koolau Forest Reserve. The land

contained within this unit is owned by the State. The natural features found in this unit are portions of the east Wailuaiki Stream and portions of the Kopiliula Stream.

Maui Gg

The proposed Maui Gg provides critical habitat for two species: *Cyanea copelandii* ssp. *haleakalaensis* and *Cyanea mceldowneyi*. This unit contains a total of 177 ha (438 ac) and is found within the State's Hanawi NAR. The land contained within this unit is owned by the State. The natural features found in this unit are western portions of Kuhiwa Valley and portions of Kuhiwa Stream and Mukupui Stream.

Maui Hh

The proposed Maui Hh provides critical habitat for two species: *Clermontia samuelii* ssp. *hanaensis* and *Cyanea mceldowneyi*. This unit contains a total of 117 ha (290 ac) and is found in the State's Hanawi NAR. The land contained within this unit is owned by the State. The natural feature found in this unit is the eastern portion of Kuhiwa Valley.

Maui Ii

The proposed Maui Ii provides critical habitat for one species: *Clermontia samuelii*. This unit contains a total of 879 ha (2,177 ac) and is found in the State's Koolau and Hana Forest Reserves. The land contained within this unit is owned by the State. The natural feature found in this unit is portions of the Mokulehua Gulch.

Maui Jj

Proposed Maui Jj provides critical habitat for one species: *Phlegmariurus mannii*. This unit contains a total of 93 ha (230 ac) and is found in the State's Kipahulu Forest Reserve. The lands contained within this unit are owned by the State. The natural features found in this unit are portions of Healani Stream and western portions of Manawainui Valley.

Maui Kk

The proposed Maui Kk provides critical habitat for two species: *Phlegmariurus mannii* and *Cyanea hamatiflora* ssp. *hamatiflora*. This unit contains a total of 144 ha (357 ac) and is found within the State's Kipahulu Forest Reserve. The lands contained within this unit are owned by the State. The natural features found in this unit are northeastern portions of Manawainui Valley, Puu Ahulili, and Niniao.

Maui Ll

The proposed Maui Ll provides critical habitat for one species: *Geranium arboreum*. This unit contains a total of 45 ha (111 ac). The lands contained within this unit are owned privately. The natural feature found in this unit is a portion of Kamehaneiki Gulch.

Maui Mm

The proposed Maui Mm provides critical habitat for one species: *Geranium arboreum*. This unit contains a total of 167 ha (413 ac) and is found in the State's Kula Forest Reserve. The lands contained within this unit are owned by the State and private owners. The natural features found in this unit are a portion of Keahuaiwi Gulch, Waiakoa, and a portion of Naalae Gulch.

Maui Nn

The proposed Maui Nn provides critical habitat for one species: *Geranium arboreum*. This unit contains a total of 692 ha (1,714 ac) and is found in the State's Kula and Kahikinui Forest Reserves. The lands contained within this unit are owned by the State and private owners. The natural features found in this unit are a portion of Kaipoioi Gulch, Kaonoulu, Waiohuli, portions of Waiohuli Gulch, and Papaanui.

Maui Oo

The proposed Maui Oo provides critical habitat for one species: *Bidens micrantha* ssp. *kalealaha*. This unit contains a total of 116 ha (287 ac). The land contained within this unit is owned by the State. The natural features found in this unit are Kahua and Kahikinui.

Maui Pp

The proposed Maui Pp provides critical habitat for one species: *Geranium arboreum*. This unit contains a total of 113 ha (280 ac) and is found in the State's Kula and Kahikinui Forest Reserves. The lands contained within this unit are owned by the State and private owners. The natural feature found in this unit is Kanaio.

Maui Qq

The proposed Maui Qq provides critical habitat for seven species: *Bidens micrantha* ssp. *kalealaha*; *Clermontia lindseyana*, *Diellia erecta*, *Diplazium molokaiense*, *Neraudia sericea*, *Phlegmariurus mannii*, and *Phyllostegia mollis*. This unit contains a total of 973 ha (2,410 ac) and is found in the State's Kahikinui Forest Reserve. The land contained within this unit is owned by the State. The natural features found in

this unit are portions of Waiopai Gulch, Manawainui Gulch, Wailaulau Gulch, and Kapuni Gulch, and Kula.

Maui Rr

The proposed Maui Rr provides critical habitat for one species: *Alectryon macrococcus*. This unit contains a total of 115 ha (285 ac) and is found in the State's Kahikinui Forest Reserve. The lands contained within this unit are owned by the State and private owners. The natural features found in this unit are Kula and portions of Panini Gulch.

Maui Ss

The proposed Maui Ss provides critical habitat for ten species: *Alectryon macrococcus*, *Bonamia menziesii*, *Cenchrus agrimonioides*, *Colubrina oppositifolia*, *Flueggea neowawraea*, *Melicope adscendens*, *Melicope knudsenii*, *Melicope mucronulata*, *Spermolepis hawaiiensis*, and *Zanthoxylum hawaiiense*. This unit contains a total of 1,924 ha (4,766 ac), portions of which are found in the Kanaio NAR. The land contained within this unit is owned by the State and private owners. The natural features found in this unit are Puu Ouli, Maunanu, Kalmaloo, Luapelani, Puu Mahoe, Auwahi, and Kanaio.

Maui Tt

The proposed Maui Tt provides critical habitat for one species: *Sesbania tomentosa*. This unit contains a total of 114 ha (282 ac). The lands contained within this unit are owned by the State and leased by the U.S. Department of Defense (Hawaii Army National Guard) for the Kanaio Training Area, and private owners. The natural features found in this unit are Pimoe and Kanaio.

Maui Uu

The proposed Maui Uu provides critical habitat for one species: *Hibiscus brackenridgei*. This unit contains a total of 121 ha (300 ac). The lands contained within this unit are owned by the State and private owners. The natural feature found in this unit is Keokea.

Maui Vv

The proposed Maui Vv provides critical habitat for one species: *Vigna owahuensis*. This unit contains a total of 77 ha (190 ac). The land contained within this unit is owned by the State. The natural features found in this unit are Kamanamana, a portion of Kaloi, and a portion of Kaunauhane.

Maui Ww

The proposed Maui Ww provides critical habitat for one species: *Flueggea neowawraea*. This unit contains a total of 133 ha (329 ac). The lands contained within this unit are owned by the State. The natural feature found in this unit is a portion of the Lualailua Hills.

Maui Xx

The proposed Maui Xx provides critical habitat for one species: *Ctenitis squamigera*. This unit contains a total of 60 ha (149 ac) and is found within the State's West Maui Forest Reserve. The lands contained within this unit are owned by the State and private owners. The natural features found in this unit are Kahana, portions of Kahanaiki Gulch, Mahinahina, and Moomoku.

Maui Yy

The proposed Maui Yy provides critical habitat for one species: *Clermontia lindseyana*. This unit contains a total of 1,118 ha (2,769 ac). The lands contained within this unit are owned by the State and private owners. The natural features found within this unit are Kamaole, Keauhau, Keonenelu, and Waihou Spring.

Maui Zz

The proposed Maui Zz provides critical habitat for one species: *Ctenitis squamigera*. This unit contains a total of 118 ha (292 ac). The lands contained within this unit are owned by the State and private owners. The natural features found in this unit are portions of Kanaha Stream, Panaewa, and Kuia.

Kahoolawe A

The proposed Kahoolawe A, the islet Puu Koae off the southern coast of Kahoolawe, provides critical habitat for one species: *Sesbania tomentosa*. This unit contains a total of 5 ha (12 ac). The land contained within this unit is owned by the State.

Kahoolawe B

The proposed Kahoolawe B provides critical habitat for one species: *Kanaloa kahoolawensis*. This unit contains a total of 38 ha (94 ac). The land contained within this unit is owned by the State. The natural feature found in this unit is Aleale.

Kahoolawe C

The proposed Kahoolawe C provides critical habitat for one species: *Vigna owahuensis*. This unit contains a total of 50 ha (124 ac). The land contained within this unit is owned by the State. The natural feature found in this unit is a tidal pond.

Kahoolawe D

The proposed Kahoolawe D provides critical habitat for one species: *Vigna o-wahuensis*. This unit contains a total of 114 ha (282 ac). The land contained within this unit is owned by the State.

Effects of Critical Habitat Designation

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 to the extent that the action appreciably diminishes the value of the critical habitat for the survival and recovery of the species. Individuals, organizations, states, local governments, and other non-Federal entities are affected by the designation of critical habitat only if their actions occur on Federal lands, require a Federal permit, license, or other authorization, or involve Federal funding.

Section 7(a) of the Act requires Federal agencies to evaluate their actions with respect to any species that is proposed or listed as endangered or threatened and with respect to its critical habitat, if any is designated or proposed. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR part 402. Section 7(a)(4) requires Federal agencies to confer with us on any action that is likely to jeopardize the continued existence of a proposed species or result in destruction or adverse modification of proposed critical habitat. Conference reports provide conservation recommendations to assist the agency in eliminating conflicts that may be caused by the proposed action. The conservation recommendations in a conference report are advisory. If a species is listed or critical habitat is designated, section 7(a)(2) requires Federal agencies to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of such a species or to destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency (action agency) must enter into consultation with us. Through this consultation we would ensure that the permitted actions do not destroy or adversely modify critical habitat.

When we issue a biological opinion concluding that a project is likely to result in the destruction or adverse modification of critical habitat, we also provide reasonable and prudent alternatives to the project, if any are identifiable. Reasonable and prudent alternatives are defined at 50 CFR

402.02 as alternative actions identified during consultation that can be implemented in a manner consistent with the intended purpose of the action, that are consistent with the scope of the Federal agency's legal authority and jurisdiction, that are economically and technologically feasible, and that the Director believes would avoid 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 in instances where critical habitat is subsequently designated and the Federal agency has retained discretionary involvement or control over the action or such discretionary involvement or control is authorized by law. Consequently, some Federal agencies may request reinitiation of consultation with us on actions for which formal consultation has been completed if those actions may affect designated critical habitat. Further, some Federal agencies may have conferenced with us on proposed critical habitat. We may adopt the formal conference report as the biological opinion when critical habitat is designated, if no significant new information or changes in the action alter the content of the opinion (see 50 CFR 402.10(d)).

Activities on lands being proposed as critical habitat for these 50 species or activities that may indirectly affect such lands and that are conducted by a Federal agency, funded by a Federal agency or require a permit from a Federal agency will be subject to the section 7 consultation process. Federal actions not affecting critical habitat, as well as actions on non-Federal lands that are not federally funded or permitted, will not require section 7 consultation.

Section 4(b)(8) of the Act requires us to briefly describe and evaluate in any proposed or final regulation that designates critical habitat those activities involving a Federal action that may adversely modify such habitat or that may be affected by such designation. 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 affect critical habitat include, but are not limited to:

(1) Activities that degrade or destroy habitat defined as a primary constituent

element, including but not limited to: Overgrazing; maintenance of feral ungulates; clearing, 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 nonnative species; and taking actions that pose a risk of fire.

(2) Water diversion or impoundment, groundwater pumping, or other activity that alters water quality or quantity to an extent that wet forest or bog vegetation is significantly affected;

(3) Recreational activities that degrade vegetation; and

(4) Activities that may destroy or adversely modify critical habitat include those that alter the primary constituent elements to the extent that the value of critical habitat for both the survival and recovery of any one of the 50 species is appreciably reduced.

To properly portray the effects of critical habitat designation, we must first compare the section 7 requirements for actions that may affect critical habitat with the requirements for actions that may affect a listed species. Section 7 prohibits actions funded, authorized, or carried out by Federal agencies from jeopardizing the continued existence of a listed species or destroying or adversely modifying the listed species' critical habitat. Actions likely to "jeopardize the continued existence" of a species are those that would appreciably reduce the likelihood of both the survival and recovery of a listed species. Actions likely to result in the destruction or adverse modification of critical habitat are those that would appreciably reduce the value of critical habitat for both the survival and recovery of the listed species.

Common to both definitions is an appreciable detrimental effect on both survival and recovery of a listed species. Given the similarity of these definitions, actions likely to result in the destruction or adverse modification of critical habitat would almost always result in jeopardy to the species concerned, particularly when the area of the proposed action is occupied by the species concerned. In those cases, critical habitat provides little additional protection to a species, and the ramifications of its designation are few or none. However, if occupied habitat becomes unoccupied in the future, there is a potential benefit from critical habitat in such areas.

Federal agencies already consult with us on activities in areas currently occupied by the species to ensure that

their actions do not jeopardize the continued existence of the species. These actions include, but are not limited to:

(1) Regulation of activities affecting waters of the United States by the Army Corps of Engineers under section 404 of the Clean Water Act;

(2) Development requiring permits from other Federal agencies such as Housing and Urban Development;

(3) Regulation of grazing and recreation, and federally funded silviculture/forestry projects and research by the U.S. Department of Agriculture (Forest Service);

(4) Regulation of airport improvement activities by the Federal Aviation Administration jurisdiction;

(5) Road construction and maintenance by, or funded by, the U.S. Department of Transportation;

(6) Military training or similar activities of the U.S. Department of Defense (Hawaii Army National Guard) on lands under their jurisdiction;

(7) Unexploded ordnance clean-up or similar activities of the U.S. Department of Defense (Navy) or their contractors on the island of Kahoolawe;

(8) Federally funded importation of alien species for research, agriculture, and aquaculture, and the release or authorization of release of biological control agents by the U.S. Department of Agriculture;

(9) Regulation of activities affecting point source pollution discharges into waters of the United States by the Environmental Protection Agency under section 402 of the Clean Water Act.;

(10) Hazard mitigation and post-disaster repairs funded by the Federal Emergency Management Agency;

(11) Installation and maintenance of U.S. Coast Guard navigational aids;

(12) Construction of communication sites licensed by the Federal Communications Commission;

(13) Construction activities by the U.S. Department of Interior (National Park Service); and

(14) Activities not mentioned above funded or authorized by the U.S. Department of Agriculture (Forest Service, Natural Resources Conservation Service), Department of Defense, Department of Transportation, Department of Energy, Department of Interior (U.S. Geological Survey, National Park Service), Department of Commerce (National Oceanic and Atmospheric Administration) or any other Federal agency.

All lands designated as critical habitat are within the geographical area occupied by these species. Thus, we consider all critical habitat proposed in this rule to be occupied. Federal

agencies already consult with us on activities in areas currently occupied by the species or if the species may be affected by the action to ensure that their actions do not jeopardize the continued existence of the species. Because of this, we do not expect any additional project modifications or restrictions or anticipate additional regulatory protection will result from critical habitat designation.

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

Consideration of 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 data 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.

We will conduct the economic analysis for this proposal prior to a final determination. When the draft economic analysis is completed, we will announce its availability with a notice in the **Federal Register**, and we will have a comment period for 30 days at that time to accept comments.

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 any public hearings, 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.

In this proposed rule, we do not propose to designate critical habitat on the private lands within Waikamoi and Kapunakea Preserves, Puu Kukui Watershed Management Area, and on the State lands in the upper areas of Hanawi Natural Area Reserve because these areas are permanently dedicated to conservation and managed to address the threats to the plant species at issue. We believe that these areas are not in need of special management considerations or protection and, therefore, do not meet the definition of critical habitat in the Act. Since we do not believe these areas meet the definition of critical habitat, critical habitat is not proposed for the four species that are only found in Waikamoi Preserve and/or Haleakala National Park (*Argyroxiphium sandwicense* ssp. *macrocephalum*, *Melicope balloui*, *Melicope ovalis*, and *Schiedea haleakalensis*). However, we are specifically soliciting comments on the appropriateness of this approach.

The Service also invites comments from the public that provide information on whether lands within proposed critical habitat are currently being managed to address conservation needs of these listed plants. As stated earlier in this proposed rule, if we receive information that any of the areas proposed as critical habitat are adequately managed, we may delete such areas from designation in 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.

In determining whether an action is likely to be implemented, we will generally consider the following:

- Whether or not a management plan or agreement exists which specifies the management actions being implemented, or if to be implemented, the schedule for implementation;
- Whether there are responsible party(ies) and funding source(s) or other resources necessary to implement the

actions, with a high level of assurance that the funding will be provided; and

- The authority and long-term commitment of the party(ies) to the agreement or plan to implement the management actions, as demonstrated, for example, by a legal instrument providing enduring protection and management of the lands.

In determining whether an action is likely to be effective, we would generally consider whether or not the plan is specific concerning the threats to be addressed by the management actions; whether such actions have been successful in the past; whether there are provisions for monitoring and assessment of the effectiveness of the management actions; and whether adaptive management principles have been incorporated into the plan.

We are aware that the State of Hawaii and some private landowners are considering the development and implementation of land management plans or agreements that may promote the conservation and recovery of endangered and threatened plant species on the island of Maui. 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., 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), including whether the benefits of designation would outweigh any threats to these species due to designation;

(2) The reasons why any particular area should or should not be designated as critical habitat for any of these species, as critical habitat is defined by section 3 of the Act (16 U.S.C. 1532(5));

(3) Specific information on the amount and distribution of habitat for *Acaena exigua*, *Alectryon macrococcus*, *Argyroxiphium sandwicense* ssp. *macrocephalum*, *Bidens micrantha* ssp. *kalealaha*, *Bonamia menziesii*, *Cenchrus agrimonioides*, *Centaurium sebaeoides*, *Clermontia lindseyana*, *Clermontia oblongifolia* ssp. *mauiensis*, *Clermontia samuelii*, *Colubrina oppositifolia*, *Ctenitis squamigera*, *Cyanea copelandii* ssp. *haleakalaensis*, *Cyanea glabra*, *Cyanea grimesiana* ssp.

grimesiana, *Cyanea hamatiflora* ssp. *hamatiflora*, *Cyanea lobata*, *Cyanea mceldowneyi*, *Cyrtandra munroi*, *Diellia erecta*, *Diplazium molokaiense*, *Dubautia plantaginea* ssp. *humilis*, *Flueggea neowawraea*, *Geranium arboreum*, *Geranium multiflorum*, *Hedyotis coriacea*, *Hedyotis manni*, *Hesperomannia arborescens*, *Hesperomannia arbuscula*, *Hibiscus brackenridgei*, *Ischaemum byrone*, *Kanaloa kahoolawensis*, *Lipochaeta kamolensis*, *Lysimachia lydgatei*, *Mariscus pennatifolius*, *Melicope adscendens*, *Melicope balloui*, *Melicope knudsenii*, *Melicope mucronulata*, *Melicope ovalis*, *Neraudia sericea*, *Peucedanum sandwicense*, *Phlegmariurus manni*, *Phyllostegia mollis*, *Plantago princeps*, *Platanthera holochila*, *Pteris lidgatei*, *Remya mauiensis*, *Sanicula purpurea*, *Schiedea haleakalensis*, *Sesbania tomentosa*, *Spermolepis hawaiiensis*, *Tetramolopium capillare*, *Vigna o-wahuensis*, and *Zanthoxylum hawaiiense*, and what habitat is essential to the conservation of the species and why;

(4) Land use practices and current or planned activities in the subject areas and their possible impacts on proposed critical habitat;

(5) Any economic or other impacts resulting from the proposed designations of critical habitat, including any impacts on small entities or families; and

(6) Economic and other potential values associated with designating critical habitat for the above 50 plant species such as those derived from non-consumptive uses (e.g., hiking, camping, birding, enhanced watershed protection, increased soil retention, "existence values," and reductions in administrative costs).

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

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. If you would like to submit comments by e-mail (mandk_crithab_pr@fws.gov), please submit e-mail comments as an ASCII file format and avoid the use of special characters and encryption. Please include "Attn: RIN 1018-AH70" and your name and return address in your e-mail message. If you do not receive a confirmation from the system that we have received your e-mail message, contact us directly by calling our Pacific

Islands Office at phone number 808/541-3441. Please note that the e-mail address will be closed out at the termination of the public comment period.

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

Our practice is to make comments, including names and home addresses of respondents, available for public review during regular business hours. Respondents may request that we withhold their home address, which we will honor to the extent allowable by law. There also may be circumstances in which we would withhold a respondent's identity, as allowable by law. If you wish us to withhold your name and/or address, you must state this request prominently at the beginning of your comment. However, we will not consider anonymous comments. To the extent consistent with applicable law, we will make all submissions from organizations or businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, available for public inspection in their entirety. Comments and materials received will be available for public inspection, by appointment, during normal business hours at the above address.

Peer Review

In accordance with our policy published on July 1, 1994 (59 FR 34270), we will seek the expert opinions of at least three appropriate and independent specialists regarding this proposed rule. The purpose of such review is to ensure listing and critical habitat decisions are based on scientifically sound data, assumptions, and analyses. We will send copies of this proposed rule to these peer reviewers immediately following publication in the **Federal Register**. We will invite the peer reviewers to comment, during the public comment period, on the specific assumptions and conclusions regarding the proposed designations of critical habitat.

We will consider all comments and data received during the 60-day comment period on this proposed rule during preparation of a final rulemaking. Accordingly, the final decision may differ from this proposal.

Clarity of the Rule

Executive Order 12866 requires each agency to write regulations and notices that are easy to understand. We invite your comments on how to make this proposed rule easier to understand

including answers to questions such as the following: (1) Are the requirements in the proposed rule clearly stated? (2) Does the proposed rule contain technical language or jargon that interferes with the clarity? (3) Does the format of the proposed rule (grouping and order of sections, use of headings, paragraphing, etc.) aid or reduce its clarity? (4) Is the description of the proposed rule in the "Supplementary Information" section of the preamble helpful in understanding the document? (5) What else could we do to make the proposed rule easier to understand?

Send a copy of any comments that concern how we could make this notice easier to understand to: Office of Regulatory Affairs, Department of the Interior, Room 7229, 1849 C Street, NW., Washington, DC 20240. You may e-mail your comments to this address: Execsec@ios.doi.gov.

Required Determinations

Regulatory Planning and Review

In accordance with Executive Order 12866, this action was submitted for review by the Office of Management and Budget (OMB). We are in the process of preparing an economic analysis to determine the economic consequences of designating the specific areas identified as critical habitat. If our economic analysis reveals that the economic impacts of designating any area as critical habitat outweigh the benefits of designation, we may exclude those areas from consideration, unless such exclusion will result in the extinction of the species.

(a) While we will prepare an economic analysis to assist us in considering whether areas should be excluded pursuant to section 4 of the Act at this time, we do not believe this

rule will have an annual economic effect of \$100 million or adversely affect an economic sector, productivity, jobs, the environment, or other units of government. Therefore we do not believe a cost benefit and economic analysis pursuant to Executive Order 12866 is required.

The 50 plants were listed as endangered or threatened species between the years 1991 and 1999. The areas proposed for critical habitat are currently occupied by one or more of these species. Under section 7 of the Act, critical habitat may not be destroyed or adversely modified by a Federal agency action; it does not impose any restrictions on non-Federal persons unless they are conducting activities funded or otherwise sponsored or permitted by a Federal agency (see Table 6).

TABLE 6.—IMPACTS OF CRITICAL HABITAT DESIGNATION FOR 50 PLANTS FROM MAUI AND KAHOO LAWE

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 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 Interior.	None.
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).	None.

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 also requires Federal agencies to ensure that they do not jeopardize the continued existence of the species. Based on our experience, due to the limited number of individuals and populations, and limited range, we conclude that any Federal action or authorized action that could potentially cause an adverse modification of the proposed critical habitat for any of these 50 species would also likely cause "jeopardy" to that species. Accordingly, the designation of currently occupied areas as critical habitat would not 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. Non-Federal persons that do not have a Federal involvement in their actions are not restricted by the designation of critical habitat.

(b) This rule will not create inconsistencies with other agencies' actions. As discussed above, Federal agencies have been required to ensure that their actions not jeopardize the continued existence of the 50 plant species since their listing between 1991 and 1999. The prohibition against adverse modification of critical habitat would not be expected to impose any additional restrictions to those that currently exist because all proposed critical habitat is currently occupied.

(c) This rule will not materially affect entitlements, grants, user fees, loan programs, or the rights and obligations of their recipients. Federal agencies are currently required to ensure that their activities do not jeopardize the continued existence of the species, and as discussed above we do not anticipate that the adverse modification prohibition resulting from critical

habitat designation will have any incremental effects.

(d) This rule will not raise novel legal or policy issues. The proposed rule follows the requirements for determining critical habitat contained in the Endangered Species Act.

Regulatory Flexibility Act (5 U.S.C. 601 et seq.)

In the economic analysis, we will determine whether designation of critical habitat will have a significant effect on a substantial number of small entities. As discussed under Regulatory Planning and Review above, this rule is not expected to result in any restrictions in addition to those currently in existence. As indicated on Table 5 (see "Methods for Selection of Areas for Proposed Critical Habitat Designations") we have designated property owned by Federal and State governments, and private property.

Within these areas, the types of Federal actions or authorized activities that we have identified as potential concerns are:

(1) Regulation of activities affecting waters of the United States by the Army Corps of Engineers under section 404 of the Clean Water Act;

(2) Development on private or State lands requiring permits from other Federal agencies such as Housing and Urban Development;

(3) Federally funded silviculture/forestry projects and research and research by the U.S. Department of Agriculture (Forest Service);

(4) Regulation of airport improvement activities by the Federal Aviation Administration jurisdiction;

(5) Road construction and maintenance by, or funded by, the U.S. Department of Transportation;

(6) Military training or similar activities of the U.S. Department of Defense (Hawaii Army National Guard) on lands under their jurisdiction;

(7) Unexploded ordnance clean-up or similar activities of the U.S. Department of Defense (Navy) or their contractors on the island of Kahoolawe;

(8) Federally funded importation of alien species for research, agriculture, and aquaculture, and the release or authorization of release of biological control agents by the U.S. Department of Agriculture;

(9) Regulation of activities affecting point source pollution discharges into waters of the United States by the Environmental Protection Agency under section 402 of the Clean Water Act;

(10) Hazard mitigation and post-disaster repairs funded by the Federal Emergency Management Agency;

(11) Installation and maintenance of U.S. Coast Guard navigational aids;

(12) Construction of communication sites licensed by the Federal Communications Commission; and

(13) Activities not mentioned above funded or authorized by the U.S. Department of Agriculture (Forest Service, Natural Resources Conservation Service), Department of Defense, Department of Transportation, Department of Energy, Department of Interior (U.S. Geological Survey, National Park Service), Department of Commerce (National Oceanic and Atmospheric Administration) or any other Federal agency.

Many of these activities authorized or funded by Federal agencies within the proposed critical habitat areas are carried out by small entities (as defined by the Regulatory Flexibility Act) through contract, grant, permit, or other Federal authorization. As discussed in section 1 above, these actions are

currently required to comply with the protections of the Act that are triggered by listing, such as avoiding jeopardy to these species, and the designation of critical habitat is not anticipated to have any additional effects on these activities.

For actions on non-Federal property that do not have a Federal connection (such as funding or authorization), the current State restrictions concerning take of listed threatened or endangered plant species remain in effect, and this rule would impose no additional restrictions.

Small Business Regulatory Enforcement Fairness Act (5 U.S.C. 804(2)).

In the economic analysis, we will determine whether designation of critical habitat will cause (a) any effect on the economy of \$100 million or more, (b) any increases in costs or prices for consumers, individual industries, Federal, State, or local government agencies, or geographic regions in the economic analysis, or (c) any significant adverse effects on competition, employment, investment, productivity, innovation, or the ability of U.S.-based enterprises to compete with foreign-based enterprises.

Unfunded Mandates Reform Act (2 U.S.C. 1501 et seq.)

In accordance with the Unfunded Mandates Reform Act (2 U.S.C. 1501 et seq.):

(a) This rule will not "significantly or uniquely" affect small governments. A Small Government Agency Plan is not required. Small governments will only be affected to the extent that any Federal agency that funds, permits or other authorized activities must ensure that their actions will not adversely affect the critical habitat. However, as discussed in section 1, these actions are currently subject to equivalent restrictions through the listing protections of the species, and no further restrictions are anticipated.

(b) This rule will not produce a Federal mandate of \$100 million or greater in any year, that is, it is not a "significant regulatory action" under the Unfunded Mandates Reform Act. The designation of critical habitat imposes no obligations on State or local governments.

Takings

In accordance with Executive Order 12630, this rule does not have significant takings implications. A takings implication assessment is not required. As discussed above, the designation of critical habitat affects only Federal agency actions. The rule

will not increase or decrease the current restrictions on private property concerning take of these 50 plant species. We do not anticipate that property values will be affected by the critical habitat designations.

Landowners in areas that are included in the designated critical habitat will continue to have opportunity to utilize their property in ways consistent with State law and with the continued survival of the plant species.

Federalism

In accordance with Executive Order 13132, the rule does not have significant Federalism effects. A Federalism assessment is not required. As discussed above, the designation of critical habitat in areas currently occupied by the 50 plant species would have little incremental impact on State and local governments and their activities. The designations may have some benefit to these governments in that the areas essential to the conservation of these species are more clearly defined, and the primary constituent elements of the habitat necessary to the survival of the species are identified. While this definition and identification does not alter where and what federally sponsored activities may occur, it may assist these local governments in long range planning rather than waiting for case-by-case section 7 consultation to occur.

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 meets the requirements of sections 3(a) and 3(b)(2) of the Order. We designate critical habitat in accordance with the provisions of the Endangered Species Act. The 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 plant species.

Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.)

This rule does not contain any information collection requirements for which OMB approval under the Paperwork Reduction Act is required.

National Environmental Policy Act

We have determined that an Environmental Assessment and/or an Environmental Impact Statement as defined by the National Environmental Policy Act of 1969 need not be prepared in connection with regulations adopted pursuant to section 4(a) of the Act, as

amended. A notice outlining our reason for this determination was published in the **Federal Register** on October 25, 1983 (48 FR 49244). This proposed rule does not constitute a major Federal action significantly affecting the quality of the human environment.

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) and 512 DM 2, we understand that Federally recognized Tribes must be related to on a Government-to-Government basis. The 1997 Secretarial Order on Native Americans and the Act clearly states that Tribal lands should not be designated unless absolutely necessary for the conservation of the species. According to the Secretarial Order, "Critical habitat shall not be designated in an area that may impact Tribal trust resources unless it is determined essential to conserve a listed species. In designating critical habitat, the Services shall evaluate and document the extent to which the conservation needs of a listed species can be achieved by limiting the designation to other lands."

We determined that no Tribal lands are essential for the conservation of the plant species discussed in this proposed ruler because they do not support populations or suitable habitat. Therefore, we are not proposing to

designate critical habitat for these species on Tribal lands.

References Cited

A complete list of all references cited in this proposed rule is available upon request from the Pacific Islands Ecoregion Office (see **ADDRESSES** section).

Authors

The primary authors of this notice are Christa Russell, Michelle Stephens, and Marigold Zoll of the Pacific Islands Field Office (see **ADDRESSES** section).

List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Reporting and record-keeping requirements, Transportation.

Proposed Regulation Promulgation

Accordingly, we propose to amend part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations as set forth below:

PART 17—[AMENDED]

1. The authority citation for part 17 continues to read as follows:

Authority: 16 U.S.C. 1361–1407; 16 U.S.C. 1531–1544; 16 U.S.C. 4201–4245; Pub. L. 99–625, 100 Stat. 3500; unless otherwise noted.

2. In § 17.12(h) revise the entries for *Alectryon macrococcus*, *Bidens micrantha* ssp. *kalealaha*, *Bonamia menziesii*, *Cenchrus agrimonioides*, *Centaurium sebaeoides*, *Clermontia lindseyana*, *Clermontia oblongifolia* ssp.

mauiensis, *Clermontia samuelii*, *Colubrina oppositifolia*, *Cyanea copelandii* ssp. *haleakalaensis*, *Cyanea glabra*, *Cyanea grimesiana* ssp. *grimesiana*, *Cyanea hamatiflora* ssp. *hamatiflora*, *Cyanea lobata*, *Cyanea mceldowneyi*, *Cyrtandra munroi*, *Dubautia plantaginea* ssp. *humilis*, *Flueggea neowawraea*, *Geranium arboreum*, *Geranium multiflorum*, *Hedyotis coriacea*, *Hedyotis manii*, *Hesperomannia arborescens*, *Hesperomannia arbuscula*, *Hibiscus brackenridgei*, *Ischaemum byrone*, *Kanaloa kahoowawensis*, *Lipochaeta kamolensis*, *Lysimachia lydgatei*, *Mariscus pennatiflorus*, *Melicope adscendens*, *Melicope knudsenii*, *Melicope* (= *Pelea*) *mucronulata*, *Neraudia sericea*, *Peucedanum sandwicense*, *Phyllostegia mollis*, *Plantago princeps*, *Platanthera holochila*, *Remya mauiensis*, *Sanicula purpurea*, *Sesbania tomentosa*, *Spermolepis hawaiiensis*, *Tetramolopium capillare*, *Vigna o-wahuensis*, and *Zanthoxylum hawaiiense* under "FLOWERING PLANTS" and *Ctenitis squamigera*, *Diellia erecta*, *Diplazium molokaiense*, *Phlegmariurus* (= *Lycopodium*, = *Huperzia*) *mannii*, and *Pteris lidgatei* under "FERNS AND ALLIES" to read as follows:

§ 17.12 Endangered and threatened plants.

* * * * *
(h) * * *

Species		Historic range	Family name	Status	When listed	Critical habitat	Special rules
Scientific name	Common name						
FLOWERING PLANTS							
* <i>Alectryon macrococcus</i> .	* Mahoe	* U.S.A.(HI)	* Sapindaceae	* E	* 467	* 17.96(a)	* NA
* <i>Bidens micrantha</i> ssp. <i>kalealaha</i> .	* Ko'oko'olau	* U.S.A.(HI)	* Asteraceae	* E	* 467	* 17.96(a)	* NA
* <i>Bonamia menziesii</i> ..	* None	* U.S.A.(HI)	* Convolvulaceae	* E	* 559	* 17.96(a)	* NA
* <i>Cenchrus agrimonioides</i> .	* Kamanomano	* U.S.A.(HI)	* Poaceae	* E	* 592	* 17.96(a)	* NA
* <i>Centaurium sebaeoides</i> .	* Awiwi	* U.S.A.(HI)	* Gentianaceae	* E	* 448	* 17.96(a)	* NA
* <i>Clermontia lindseyana</i> .	* 'Oha wai	* U.S.A.(HI)	* Campanulaceae	* E	* 467	* 17.96(a)	* NA

Species		Historic range	Family name	Status	When listed	Critical habitat	Special rules
Scientific name	Common name						
<i>Clermontia oblongifolia</i> ssp. <i>mauiensis</i> .	'Oha wai	U.S.A.(HI)	Campanulaceae	E	466	17.96(a)	NA
<i>Clermontia samuelii</i>	'Oha wai	U.S.A.(HI)	Campanulaceae	E	666	17.96(a)	NA
<i>Colubrina oppositifolia</i> .	Kauila	U.S.A.(HI)	Rhamnaceae	E	532	17.96(a)	NA
<i>Cyanea copelandii</i> ssp. <i>haleakalaensis</i> .	Haha	U.S.A.(HI)	Campanulaceae	E	666	17.96(a)	NA
<i>Cyanea glabra</i>	Haha	U.S.A.(HI)	Campanulaceae	E	666	17.96(a)	NA
<i>Cyanea grimesiana</i> ssp. <i>grimesiana</i> .	Haha	U.S.A.(HI)	Campanulaceae	E	592	17.96(a)	NA
<i>Cyanea hamatiflora</i> ssp. <i>hamatiflora</i> .	Haha	U.S.A.(HI)	Campanulaceae	E	666	17.96(a)	NA
<i>Cyanea lobata</i>	Haha	U.S.A.(HI)	Campanulaceae	E	467	17.96(a)	NA
<i>Cyanea mceldowneyi</i>	Haha	U.S.A.(HI)	Campanulaceae	E	467	17.96(a)	NA
<i>Cyrtandra munroi</i>	Ha'iwale	U.S.A.(HI)	Gesneriaceae	E	467	17.96(a)	NA
<i>Dubautia plantaginea</i> ssp. <i>humilis</i>	Na'ena'e	U.S.A.(HI)	Asteraceae	E	666	17.96(a)	NA
<i>Flueggea neowawraea</i> .	Mehamehame	U.S.A.(HI)	Euphorbiaceae	E	559	17.96(a)	NA
<i>Geranium arboreum</i>	Hawaiian red-flowered Geranium.	U.S.A.(HI)	Geraniaceae	E	465	17.96(a)	NA
<i>Geranium multiflorum</i> .	Nohoanu	U.S.A.(HI)	Geraniaceae	E	467	17.96(a)	NA
<i>Hedyotis coriacea</i>	Kio'ele	U.S.A.(HI)	Rubiaceae	E	467	17.96(a)	NA
<i>Hedyotis mannii</i>	Pilo	U.S.A.(HI)	Rubiaceae	E	480	17.96(a)	NA
<i>Hesperomannia arborescens</i> .	None	U.S.A.(HI)	Asteraceae	E	536	17.96(a)	NA
<i>Hesperomannia arbuscula</i> .	None	U.S.A.(HI)	Asteraceae	E	448	17.96(a)	NA
<i>Hibiscus brackenridgei</i> .	Ma'o hau hele	U.S.A.(HI)	Malvaceae	E	559	17.96(a)	NA
<i>Ischaemum byrone</i>	Hilo ischaemum	U.S.A.(HI)	Poaceae	E	532	17.96(a)	NA

Species		Historic range	Family name	Status	When listed	Critical habitat	Special rules
Scientific name	Common name						
<i>Kanaloa kahoolawensis.</i>	Kohe malama malama o kanaloa.	U.S.A.(HI)	Fabaceae	E	666	17.96(a)	NA
<i>Lipochaeta kamolensis.</i>	Nehe	U.S.A.(HI)	Asteraceae	E	467	17.96(a)	NA
<i>Lysimachia lydgatei</i>	None	U.S.A.(HI)	Primulaceae	E	467	17.96(a)	NA
<i>Mariscus pennatiformis.</i>	None	U.S.A.(HI)	Cyperaceae	E	559	17.96(a)	NA
<i>Melicope adscendens.</i>	Alani	U.S.A.(HI)	Rutaceae	E	565	17.96(a)	NA
<i>Melicope knudsenii</i> ..	Alani	U.S.A.(HI)	Rutaceae	E	530	17.96(a)	NA
<i>Melicope (= Pelea) mucronulata)</i> ..	Alani	U.S.A.(HI)	Rutaceae	E	467	17.96(a)	NA
<i>Neraudia sericea</i>	None	U.S.A.(HI)	Urticaceae	E	559	17.96(a)	NA
<i>Peucedanum sandwicense.</i>	Makou	U.S.A.(HI)	Apiaceae	T	530	17.96(a)	NA
<i>Phyllostegia mollis</i> ...	None	U.S.A.(HI)	Lamiaceae	E	448	17.96(a)	NA
<i>Plantago princeps</i>	Laukahi kuahiwi	U.S.A.(HI)	Plantaginaceae	E	559	17.96(a)	NA
<i>Platanthera holochila</i>	None	U.S.A.(HI)	Orchidaceae	E	592	17.96(a)	NA
<i>Remya mauiensis</i>	Maui remya	U.S.A.(HI)	Asteraceae	E	413	17.96(a)	NA
<i>Sanicula purpurea</i> ...	None	U.S.A.(HI)	Apiaceae	E	592	17.96(a)	NA
<i>Sesbania tomentosa</i>	Ohai	U.S.A.(HI)	Fabaceae	E	559	17.96(a)	NA
<i>Spermolepis hawaiiensis.</i>	None	U.S.A.(HI)	Apiaceae	E	559	17.96(a)	NA
<i>Tetramolopium capillare.</i>	Pamakani	U.S.A.(HI)	Asteraceae	E	555	17.96(a)	NA
<i>Vigna o-wahuensis</i> ..	None	U.S.A.(HI)	Fabaceae	E	559	17.96(a)	NA
<i>Zanthoxylum hawaiiense.</i>	A'e	U.S.A.(HI)	Rutaceae	E	532	17.96(a)	NA
FERNS AND ALLIES							
<i>Ctenitis squamigera</i>	Pauoa	U.S.A.(HI)	Dryopteridaceae	E	553	17.96(a)	NA
<i>Diellia erecta</i>	Asplenium-leaved diellia.	U.S.A.(HI)	Aspleniaceae	E	559	17.96(a)	NA

Species		Historic range	Family name	Status	When listed	Critical habitat	Special rules
Scientific name	Common name						
*	*	*	*	*	*	*	*
<i>Diplazium molokaiense</i> .	None	U.S.A.(HI)	Aspleniaceae	E	553	17.96(a)	NA
*	*	*	*	*	*	*	*
<i>Phlegmariurus</i> (<i>Lycopodium</i> , = <i>Huperzia</i>) <i>mannii</i> .	Wawae'iole	U.S.A.(HI)	Lycopodiaceae	E	467	17.96(a)	NA
*	*	*	*	*	*	*	*
<i>Pteris lidgatei</i>	None	U.S.A.(HI)	Adiantaceae	E	553	17.96(a)	NA
*	*	*	*	*	*	*	*

3. In § 17.96, as proposed to be amended at 65 FR 66865, November 7, 2000, add introductory text to paragraph (a)(1)(i), add paragraph (a)(1)(i)(C) and (a)(1)(i)(D), and revise paragraphs (a)(1)(ii)(A) and (a)(1)(ii)(B) to read as follows:

§ 17.96 Critical habitat—plants.

(a) * * *

(1) * * *

(i) *Maps and critical habitat unit descriptions.* The following sections

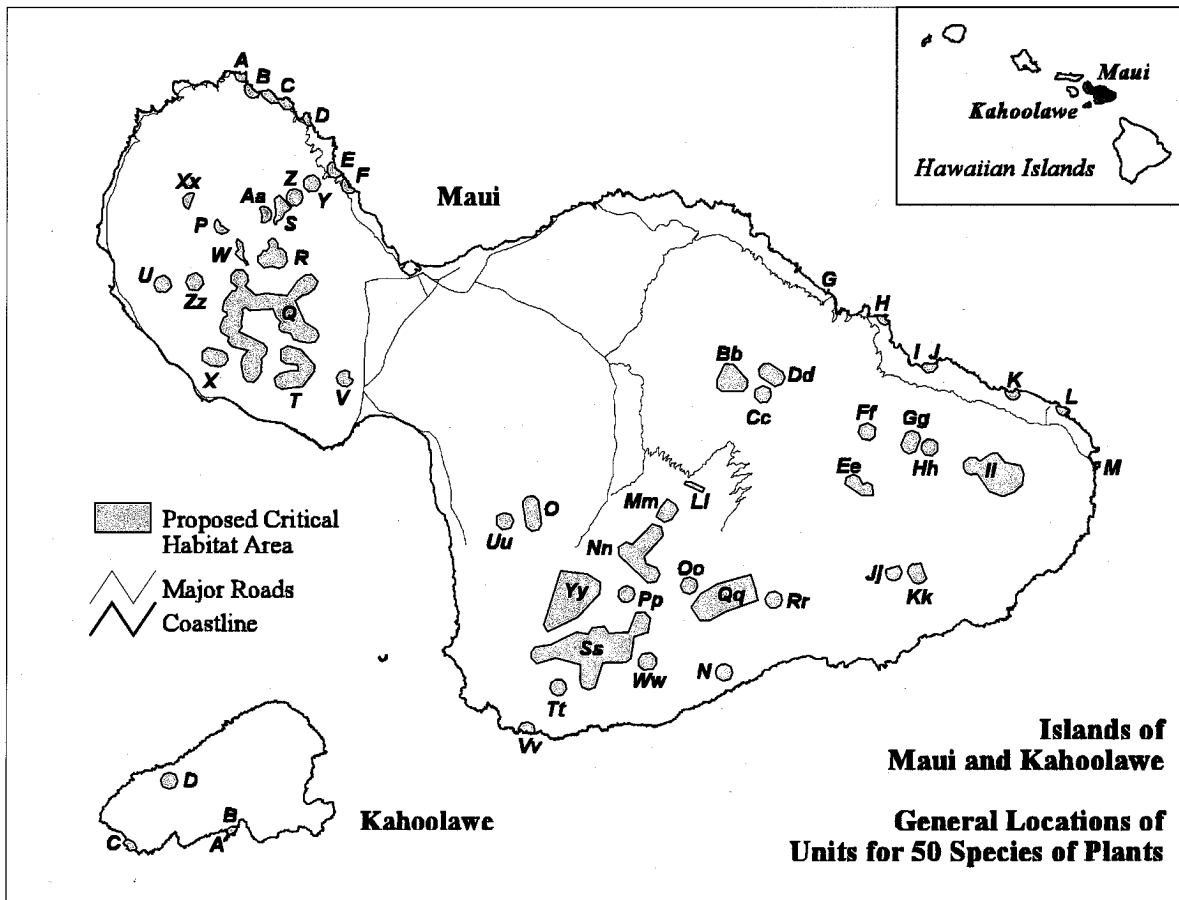
contain the legal descriptions of the critical habitat units designated for each of the Hawaiian islands. Existing features and structures within proposed areas, such as buildings, roads, aqueducts, telecommunication equipment, arboreta and gardens, heiaus (indigenous place of worship, shrine), and other man-made features, do not contain, and are not likely to develop, the constituent elements described for each species in paragraphs (a)(1)(ii)(A) and (a)(1)(ii)(B) of this section.

Therefore, these features or structures are not included in the critical habitat designation.

* * * * *

(C) *Maui.* Critical habitat units are described below. Coordinates are in UTM Zone 4 with units in meters using North American Datum of 1983 (NAD83). The following map shows the general locations of the 52 critical habitats units designated on the island of Maui.

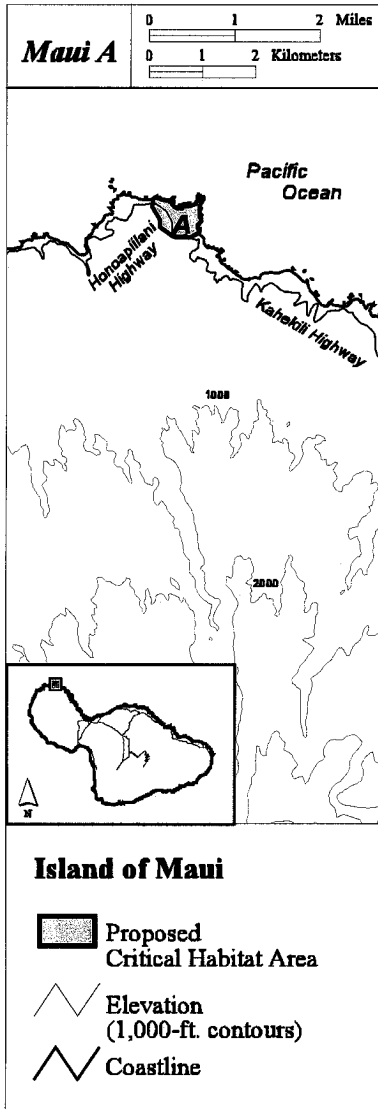
Note: Map Follows:



Critical Habitat Maui A (49 ha; 121 ac)

Unit consists of the following seven boundary points and the intermediate coastline: 750633, 2326772; 750456, 2326683; 750130, 2326703; 749888, 2326884; 749886, 2327030; 749750, 2327258; 749774, 2327433.

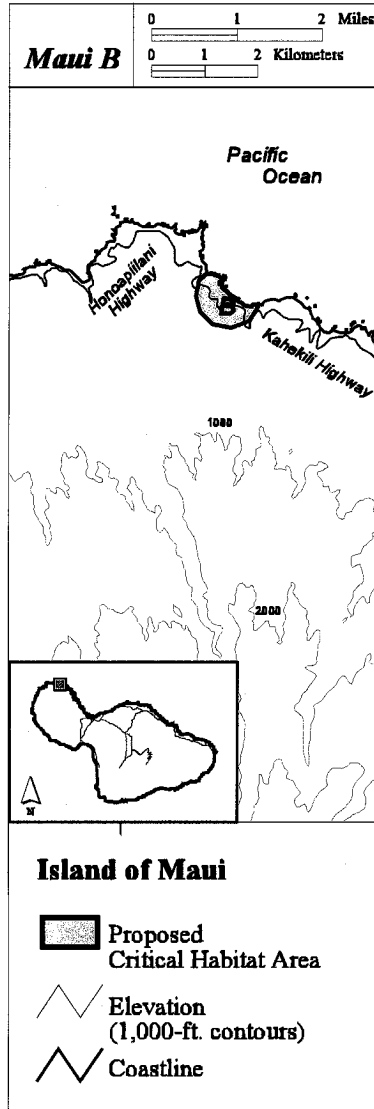
Note: Map follows:



Critical Habitat Maui B (67 ha; 166 ac)

Unit consists of the following nine boundary points and the intermediate coastline: 751694, 2325923; 751701, 2325885; 751529, 2325612; 751186, 2325473; 750835, 2325553; 750612, 2325770; 750532, 2326078; 750587, 2326375; 750748, 2326531.

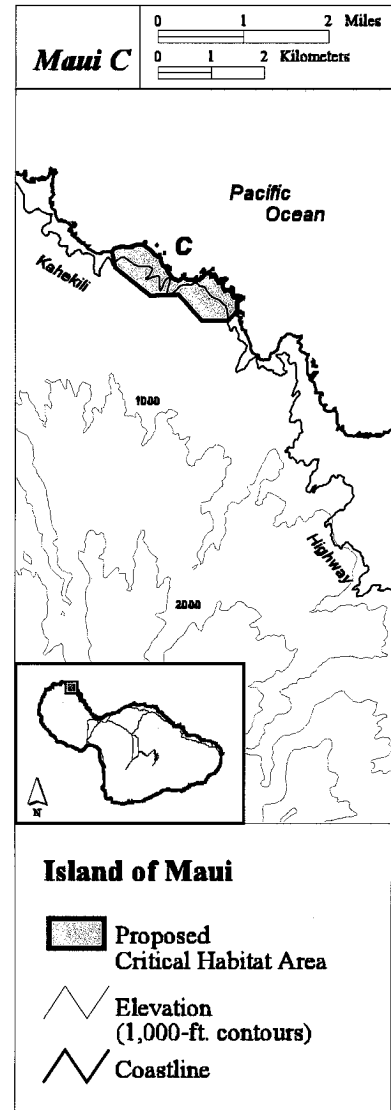
Note: Map follows:



Critical Habitat Maui C (144.1 ha; 357.3 ac)

Area consists of the following seven points and intermediate coastline: Start approximately at the coastline at UTM coordinate 754097, 2324739; 753959, 2324610; 753471, 2324616; 753034, 2325110; 752505, 2325093; 751841, 2325621; 751777, 2325920.

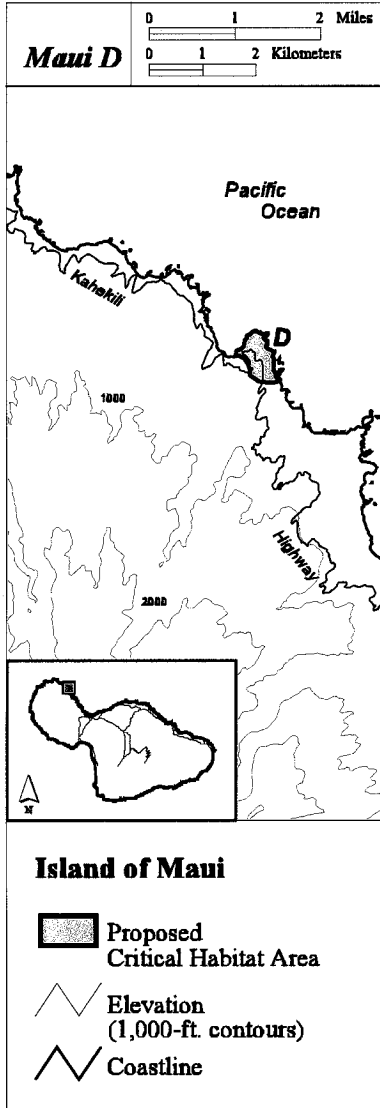
NOTE: Map follows:



Critical Habitat Maui D (45 ha; 111 ac)

Unit consists of the following nine boundary points and the intermediate coastline: 755603, 2323416; 755458, 2323375; 755192, 2323407; 755029, 2323524; 755023, 2323623; 754989, 2323720; 754905, 2323851; 754823, 2323887; 754754, 2323893.

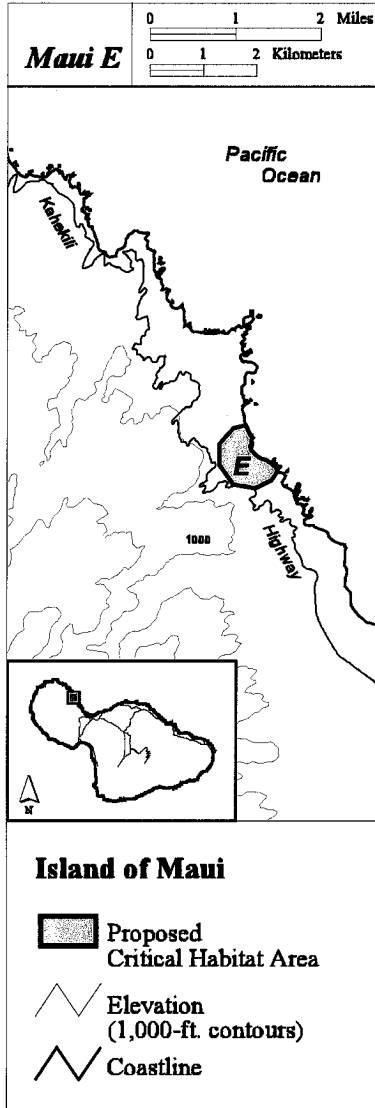
NOTE: Map follows:



Critical Habitat Maui E (79 ha; 194 ac)

Unit consists of the following eight boundary points and the intermediate coastline: 757806, 2319806; 757685, 2319625; 757377, 2319478; 756960, 2319544; 756704, 2319914; 756704, 2320323; 756970, 2320617; 757205, 2320672.

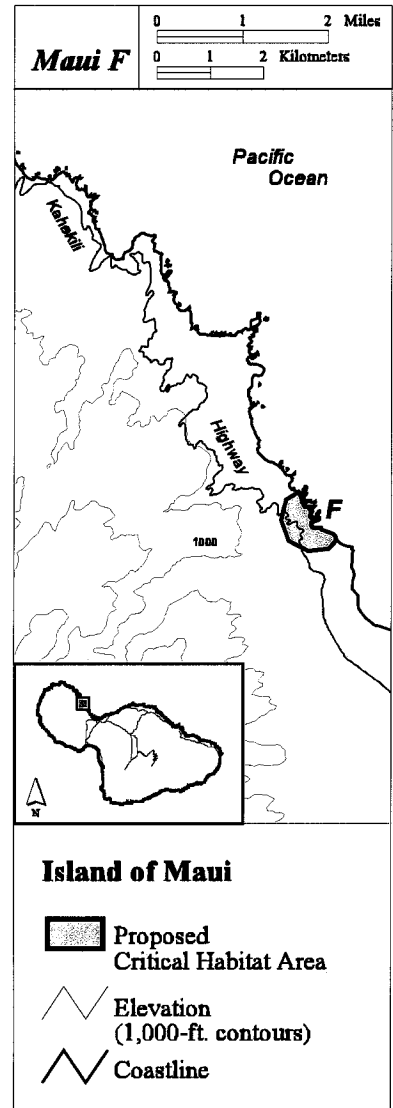
NOTE: Map follows:



Critical Habitat Maui F (61 ha; 150 ac)

Unit consists of the following seven boundary points and the intermediate coastline: 758780, 2318541; 758624, 2318378; 758239, 2318333; 757873, 2318527; 757741, 2318914; 757835, 2319306; 758062, 2319448.

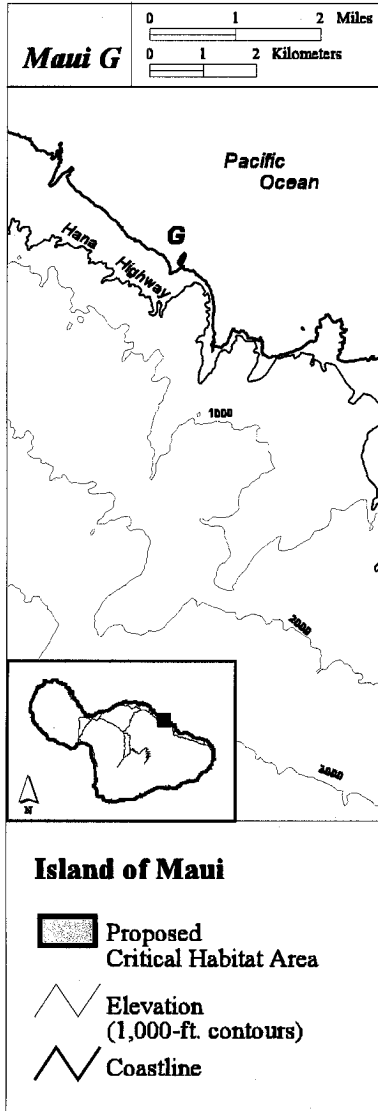
Note: Map follows:



Critical Habitat Maui G (1 ha; 2 ac)

Unit consists of the entire island, located at UTM coordinate 794211, 2310986.

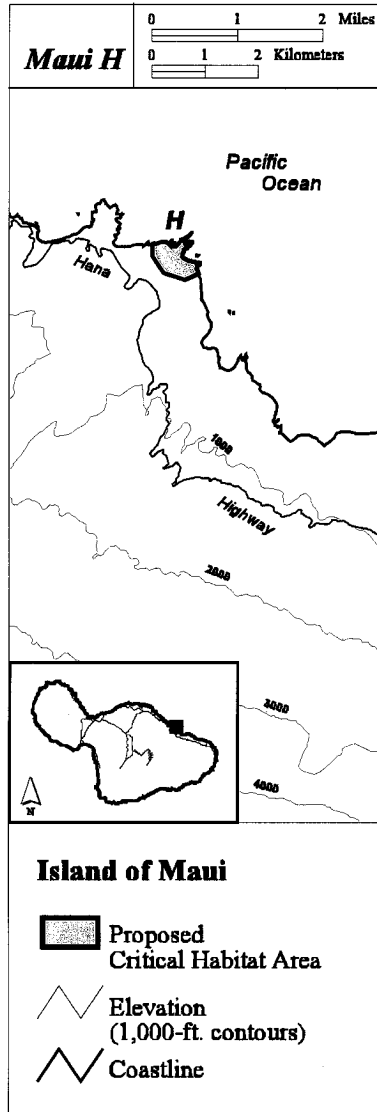
Note: Map follows:



Critical Habitat Maui H (42 ha; 104 ac)

Unit consists of the following five boundary points and the intermediate coastline: 798775, 2308545; 798511, 2308422; 798109, 2308552; 797895, 2308879; 797900, 2309107.

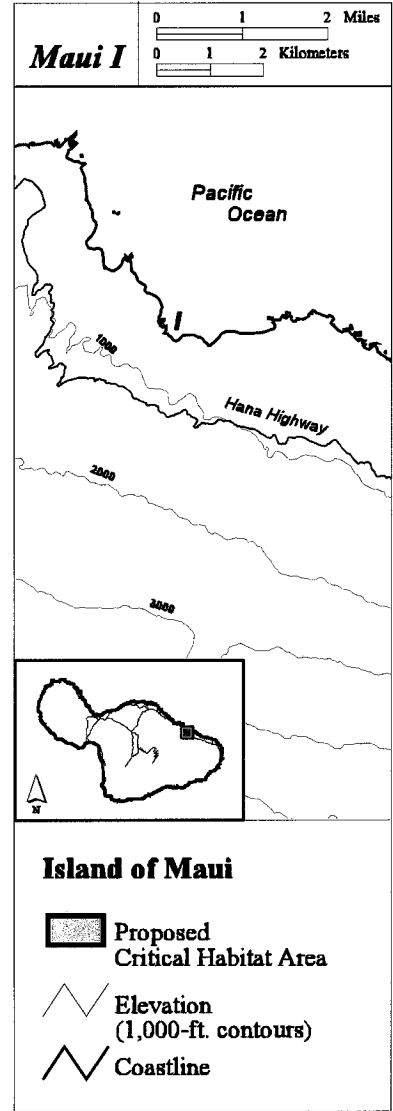
Note: Map follows:



Critical Habitat Maui I (0.1 ha; 0.3 ac)

Unit consists of the entire island, located at UTM coordinate 800254, 2305748.

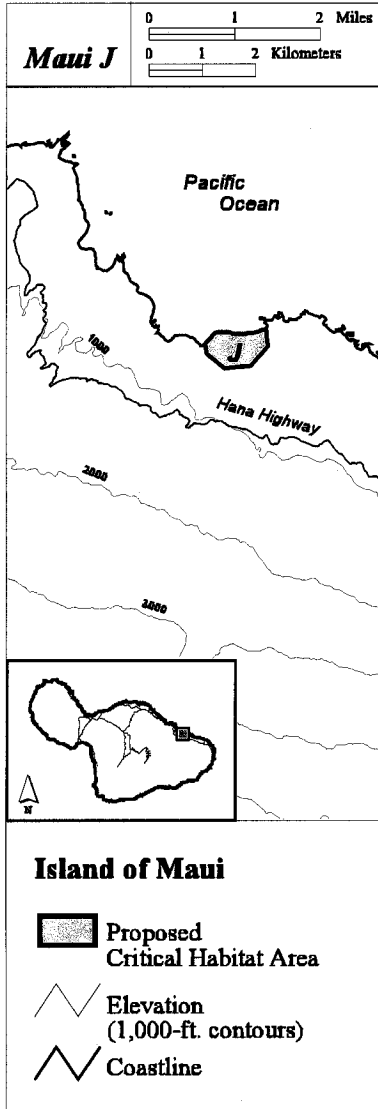
Note: Map follows:



Critical Habitat Maui J (63 ha; 157 ac)

Unit consists of the following six boundary points and the intermediate coastline: 802363, 2305610; 802394, 2305272; 802072, 2304901; 801579, 2304862; 801251, 2305132; 801206, 2305331.

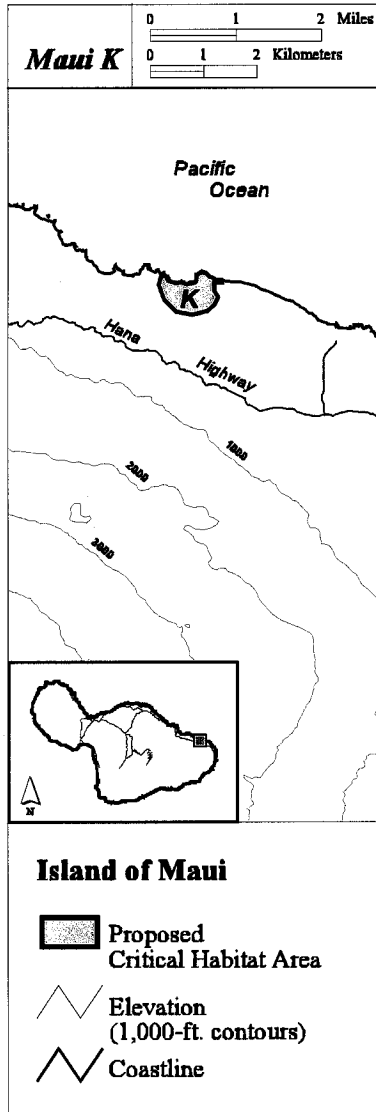
Note: Map follows:



Critical Habitat Maui K (61 ha; 150 ac)

Unit consists of the following twelve boundary points and the intermediate coastline: 808655, 2303467; 808652, 2303423; 808501, 2303430; 808499, 2303256; 808577, 2303146; 808506, 2303006; 808369, 2302880; 808087, 2302805; 807783, 2302870; 807561, 2303089; 807460, 2303384; 807518, 2303589.

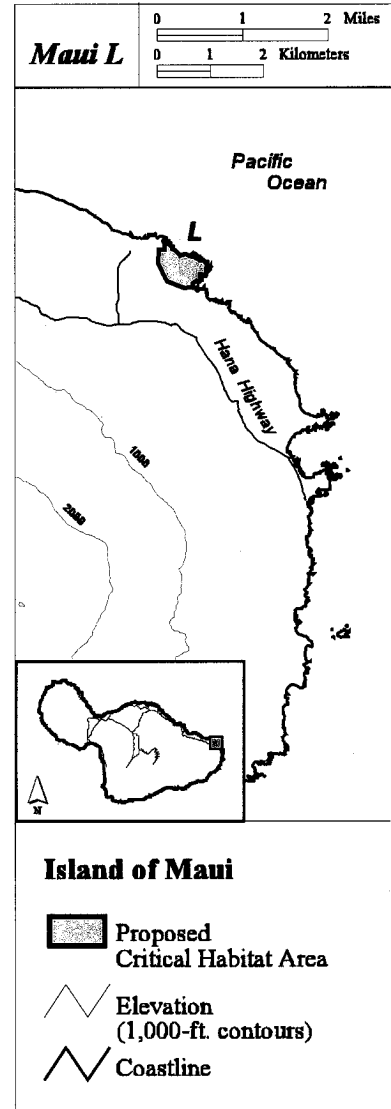
Note: Map follows:



Critical Habitat Maui L (50 ha; 124 ac)

Unit consists of the following nine boundary points and the intermediate coastline: 811990, 2301607; 811819, 2301595; 811486, 2301731; 811327, 2302067; 811331, 2302315; 811456, 2302318; 811455, 2302431; 811419, 2302481; 811458, 2302548.

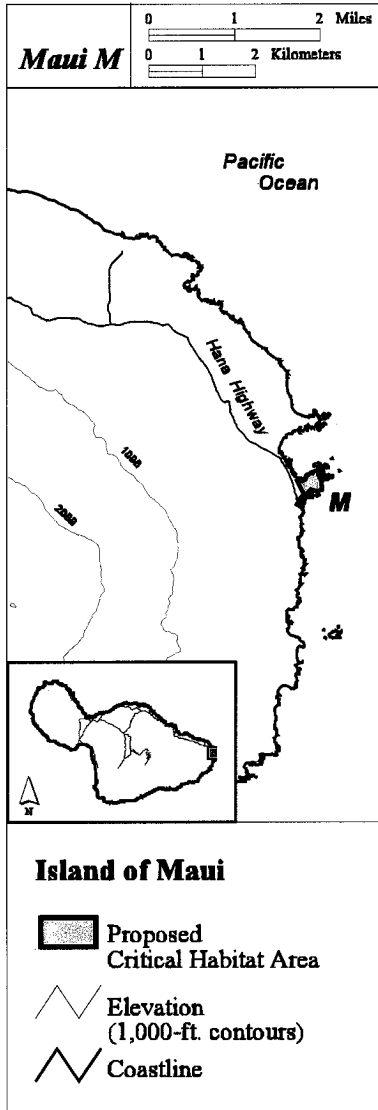
Note: Map follows:



Critical Habitat Maui M (14.3 ha; 35.7 ac)

Unit consists of the following eight boundary points and the intermediate coastline: 814158, 2297468; 814095, 2297500; 814187, 2297634; 814242, 2297672; 814116, 2297928; 814198, 2297932; 814268, 2297968; 814303, 2298064.

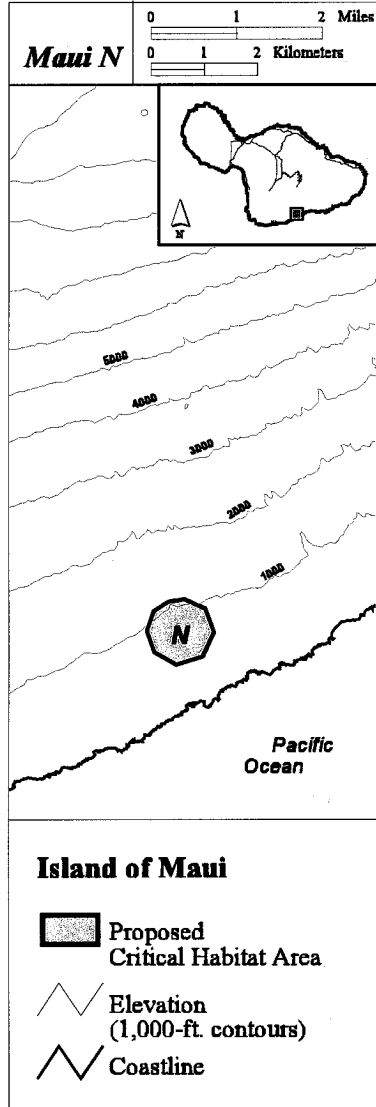
Note: Map follows:



Critical Habitat Maui N (115 ha; 284 ac)

Unit consists of the following nine boundary points: 786248, 2282907; 786554, 2282957; 786936, 2282772; 787107, 2282321; 786893, 2281864; 786401, 2281705; 785985, 2281950; 785844, 2282345; 785967, 2282728.

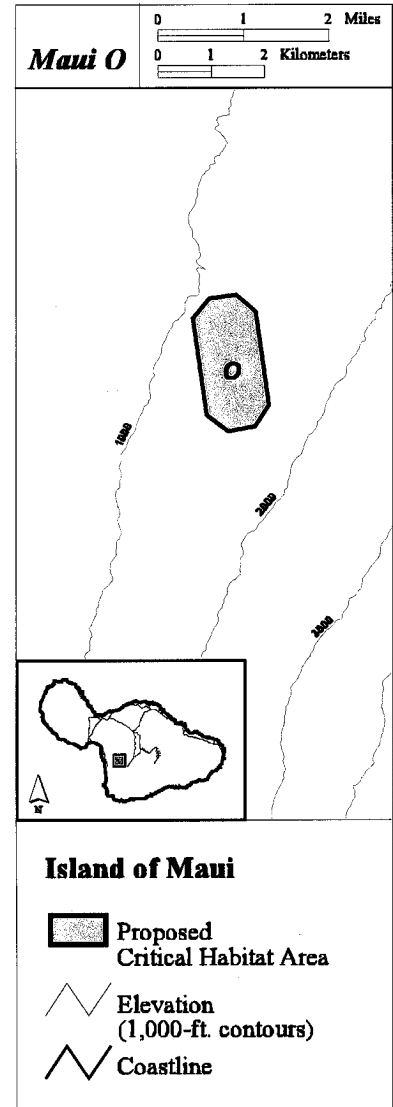
Note: Map follows:



Critical Habitat Maui O (278 ha; 688 ac)

Unit consists of the following eight boundary points: 771668, 2295517; 772176, 2295586; 772539, 2295263; 772790, 2293479; 772527, 2293084; 772026, 2292986; 771623, 2293297; 771351, 2295136.

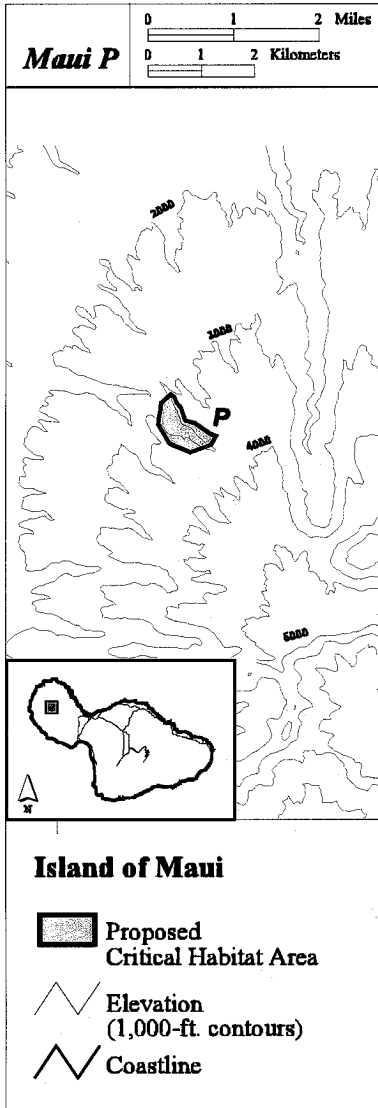
Note: Map follows:



Critical Habitat Maui P (58 ha; 144 ac)

Unit consists of the following thirteen boundary points: 748750, 2315870; 748926, 2315818; 749219, 2315615; 749336, 2315565; 749244, 2315410; 748854, 2315265; 748457, 2315426; 748247, 2315790; 748306, 2316197; 748486, 2316360; 748551, 2316304; 748584, 2316209; 748668, 2316115.

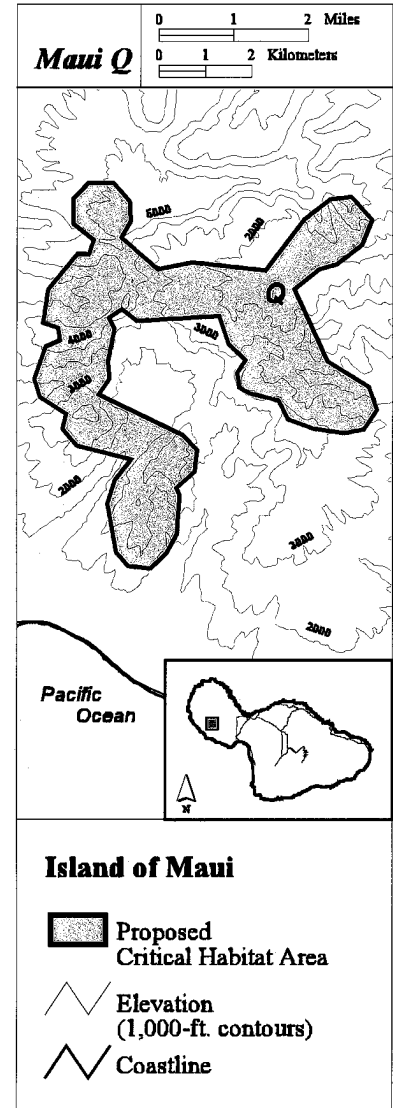
Note: Map follows:



Critical Habitat Maui Q (2,338 ha; 5,791 ac)

Unit consists of the following sixty-five boundary points: 750771, 2312124; 750790, 2311697; 750578, 2311354; 751367, 2310653; 752118, 2310799; 753695, 2310630; 754534, 2311735; 755091, 2312174; 755559, 2312225; 756008, 2311720; 755784, 2311189; 755248, 2310771; 754859, 2310651; 754315, 2310226; 755033, 2308654; 755940, 2308099; 756110, 2307598; 755825, 2307180; 755406, 2307098; 754741, 2307185; 754188, 2307390; 753983, 2307802; 753340, 2307955; 753129, 2308088; 753088, 2308412; 753261, 2308676; 752903, 2309029; 752695, 2309644; 750916, 2309529; 750598, 2309792; 750316, 2309596; 750439, 2309356; 750292, 2308660; 750320, 2308277; 750095, 2307938; 751915, 2307054; 752216, 2306733; 752165, 2306253; 751768, 2305894; 751845, 2305755; 751784, 2304903; 751556, 2304475; 751223, 2304157; 750736, 2304202; 750467, 2304503; 750289, 2305559; 750449, 2306075; 750805, 2306520; 749621, 2306816; 749314, 2307195; 749385, 2307517; 748814, 2307874; 748699, 2308271; 748949, 2308977; 749251, 2309111; 749218, 2309383; 748891, 2309495; 748997, 2310228; 749635, 2310991; 749876, 2310977; 749988, 2311296; 749540, 2311646; 749543, 2312185; 749873, 2312535; 750410, 2312543.

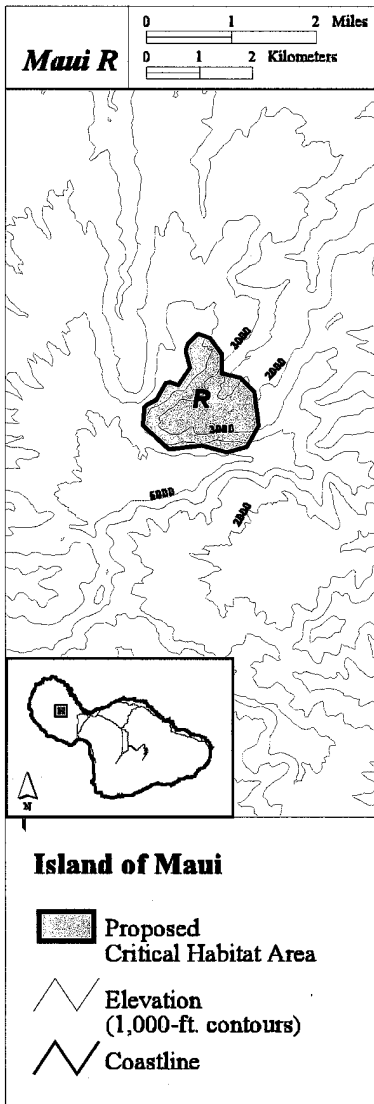
Note: Map follows:



Critical Habitat Maui R (299.1 ha; 740.3 ac)

Unit consists of the following twenty-one boundary points: 752540, 2314961; 752773, 2314883; 752997, 2314576; 752995, 2314200; 753348, 2314121; 753615, 2313849; 753691, 2313211; 753468, 2312810; 753085, 2312694; 752612, 2312832; 751992, 2312757; 751497, 2313211; 751524, 2313557; 751582, 2313614; 751746, 2313692; 751933, 2314010; 752006, 2314036; 752164, 2313975; 752394, 2314306; 752308, 2314642; 752358, 2314769.

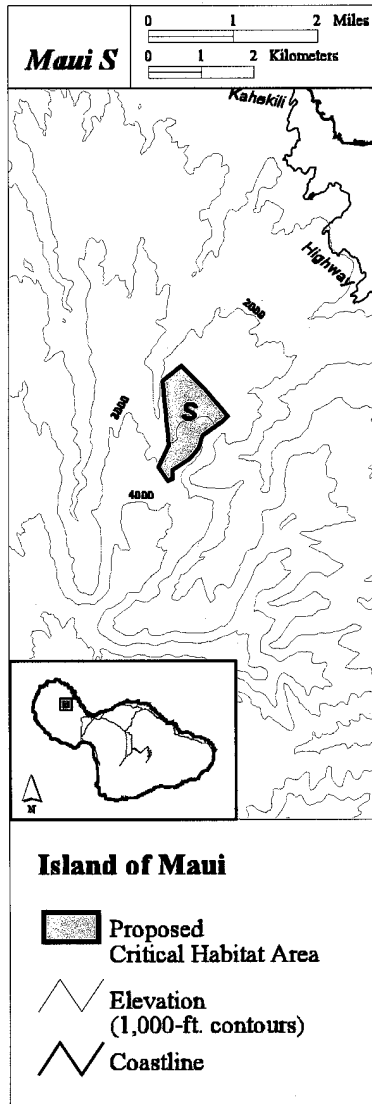
Note: Map follows:



Critical Habitat Maui S (143 ha; 354 ac)

Unit consists of the following thirteen boundary points: 752751, 2317904; 753106, 2318187; 753571, 2317718; 753990, 2317221; 753879, 2317115; 753513, 2316860; 753439, 2316618; 753273, 2316414; 752929, 2316198; 752932, 2316027; 752839, 2315991; 752670, 2316256; 752869, 2316683.

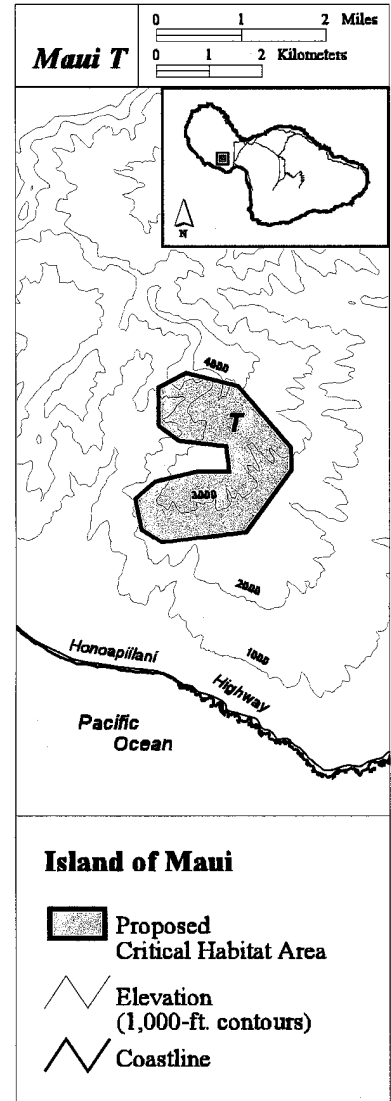
Note: Map follows:



Critical Habitat Maui T (580 ha; 1,436 ac)

Unit consists of the following fifteen boundary points: 753246, 230584; 753238, 2306579; 753759, 2306849; 754750, 2306605; 755757, 2305428; 755763, 2305006; 754900, 2303806; 753297, 2303611; 752908, 2303851; 752785, 2304448; 753174, 2304779; 753962, 2304969; 754581, 2304970; 754515, 2305458; 753623, 2305561.

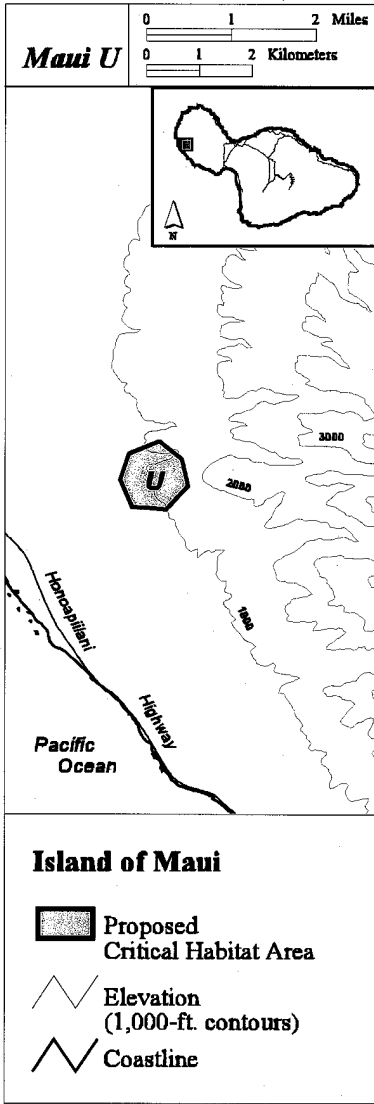
Note: Map follows:



Critical Habitat Maui U (120 ha; 298 ac)

Unit consists of the following seven boundary points: 744526, 2312185; 744948, 2311845; 745071, 2311334; 744655, 2310891; 744008, 2310932; 743776, 2311456; 743947, 2311954.

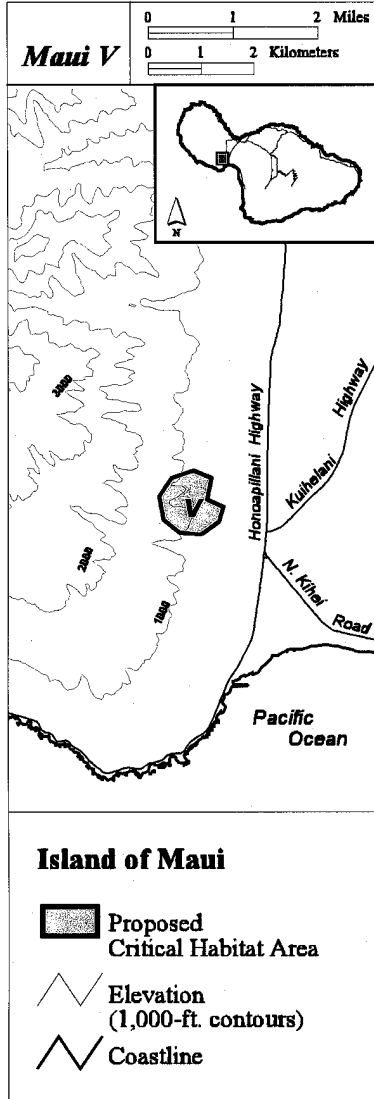
Note: Map follows:



Critical Habitat Maui V (103 ha; 255 ac)

Unit consists of the following ten boundary points: 758083, 2305035; 758421, 2304900; 758346, 2304479; 758653, 2304334; 758566, 2304050; 758222, 2303804; 757824, 2303841; 757517, 2304094; 757436, 2304539; 757665, 2304897.

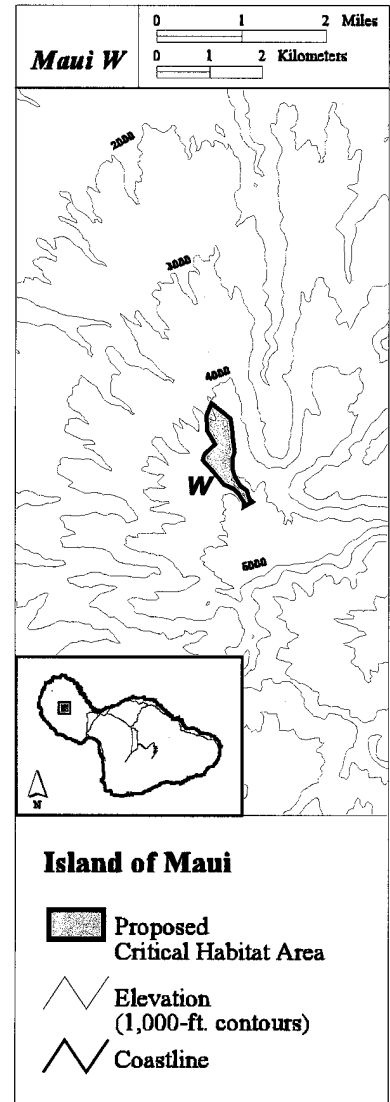
Note: Map follows:



Critical Habitat Maui W (69 ha; 172 ac)

Unit consists of the following twenty-one boundary points: 750403, 2314584; 750470, 2313939; 750431, 2313836; 750429, 2313611; 750465, 2313493; 750581, 2313305; 750705, 2313201; 750756, 2313045; 750814, 2312992; 750650, 2312902; 750660, 2312967; 750541, 2313163; 750455, 2313243; 750267, 2313325; 750046, 2313596; 749865, 2313788; 749906, 2313905; 750108, 2314098; 749945, 2314364; 749932, 2314648; 750027, 2314876.

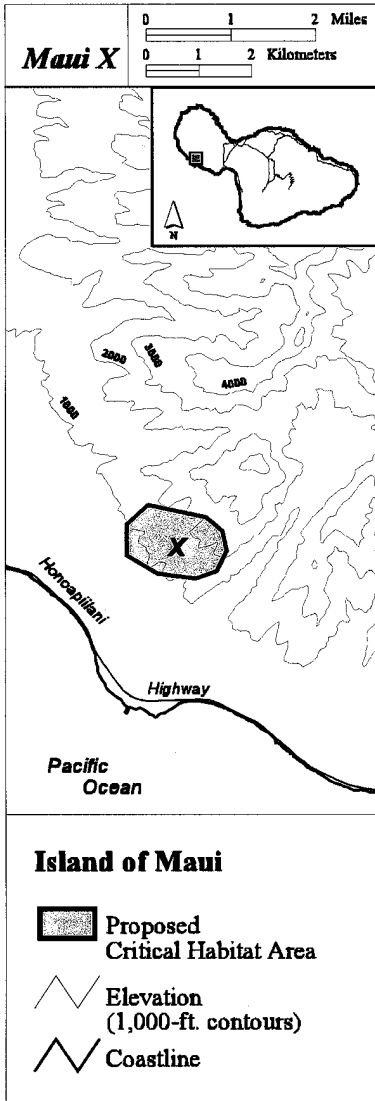
Note: Map follows:



Critical Habitat Maui X (204 ha; 505 ac)

Unit consists of the following nine boundary points: 747781, 2306743; 748893, 2306503; 749197, 2306248; 749279, 2305850; 749084, 2305460; 748688, 2305318; 747967, 2305419; 747371, 2305769; 747379, 2306377.

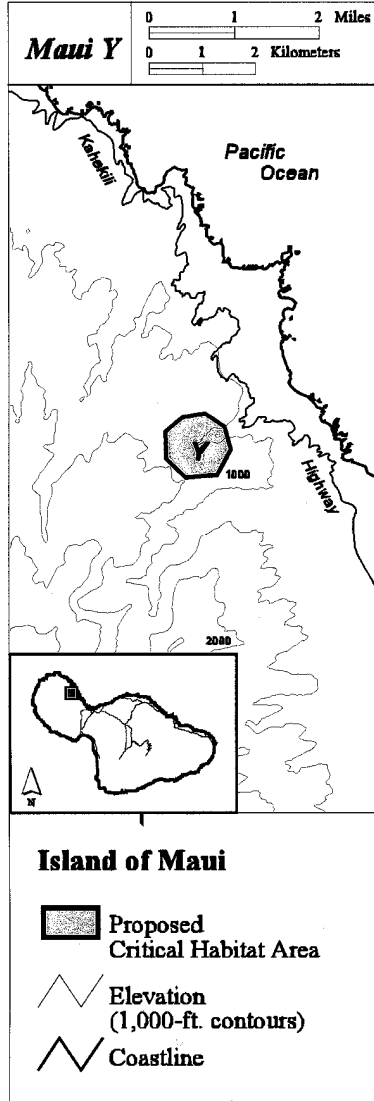
Note: Map follows:



Critical Habitat Maui Y (116 ha; 287 ac)

Unit consists of the following eight boundary points: 755267, 2319597; 755686, 2319662; 756061, 2319419; 756179, 2318978; 755912, 2318493; 755321, 2318439; 754959, 2318795; 754947, 2319319.

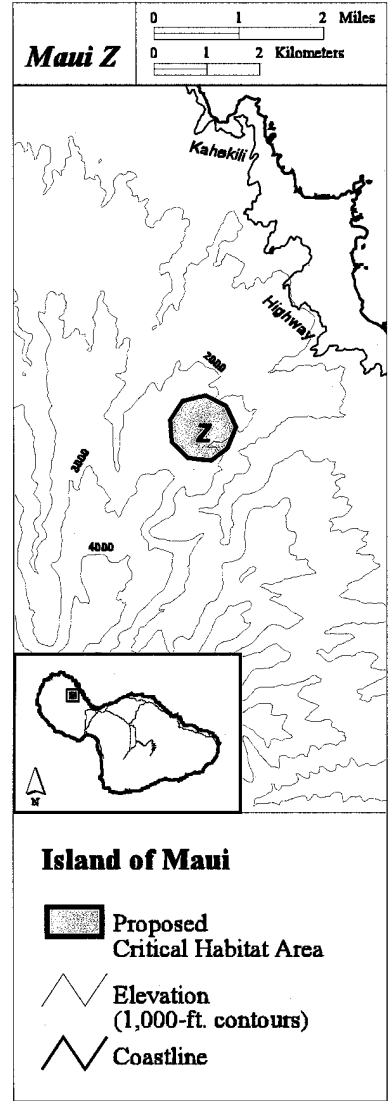
Note: Map follows:



Critical Habitat Maui Z (115 ha; 284 ac)

Unit consists of the following nine boundary points: 754334, 2318638; 754726, 2318445; 754908, 2318033; 754740, 2317636; 754431, 2317403; 754002, 2317451; 753690, 2317749; 753658, 2318167; 753894, 2318536.

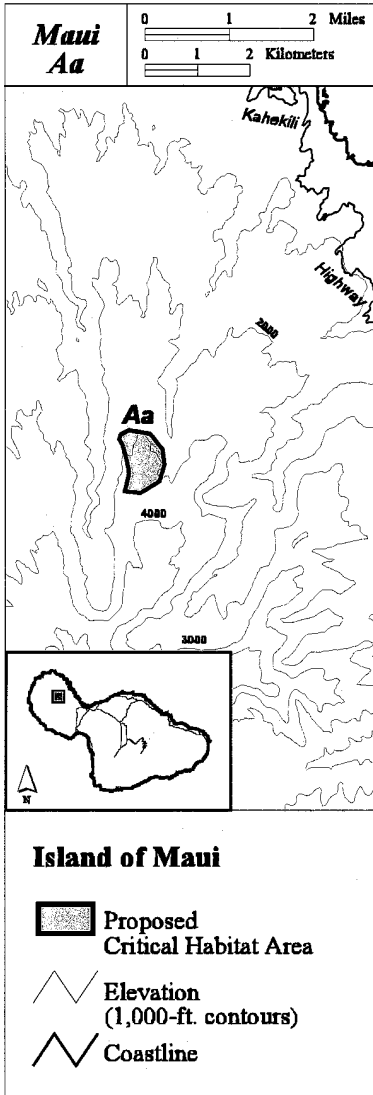
Note: Map follows:



Critical Habitat Maui Aa (74.3 ha; 183.7 ac)

Unit consists of the following twelve boundary points: 751685, 2317244; 751861, 2317323; 752265, 2317256; 752494, 2316959; 752538, 2316661; 752442, 2316337; 752076, 2316112; 751770, 2316146; 751858, 2316497; 751827, 2316694; 751730, 2317048; 751671, 2317144.

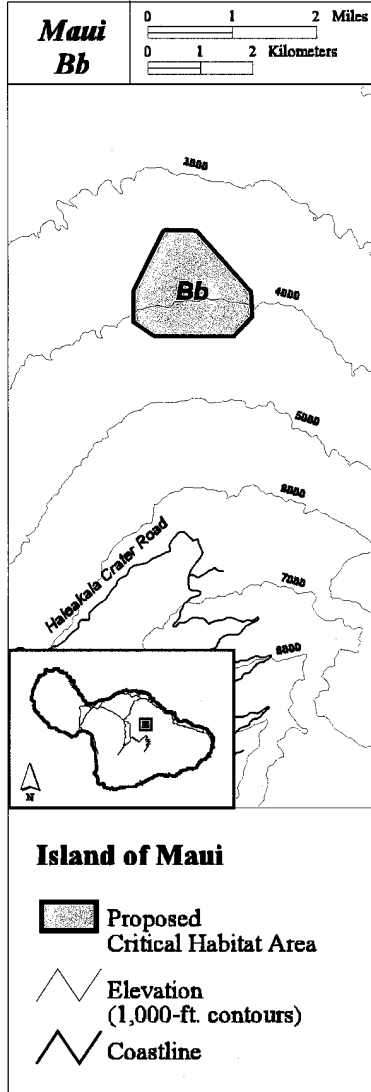
Note: Map follows:



Critical Habitat Maui Bb (352 ha; 872 ac)

Unit consists of the following eight boundary points: 786494, 2305496; 787116, 2305481; 788158, 2304306; 788186, 2303838; 787832, 2303458; 786315, 2303459; 785903, 2303731; 785907, 2304339.

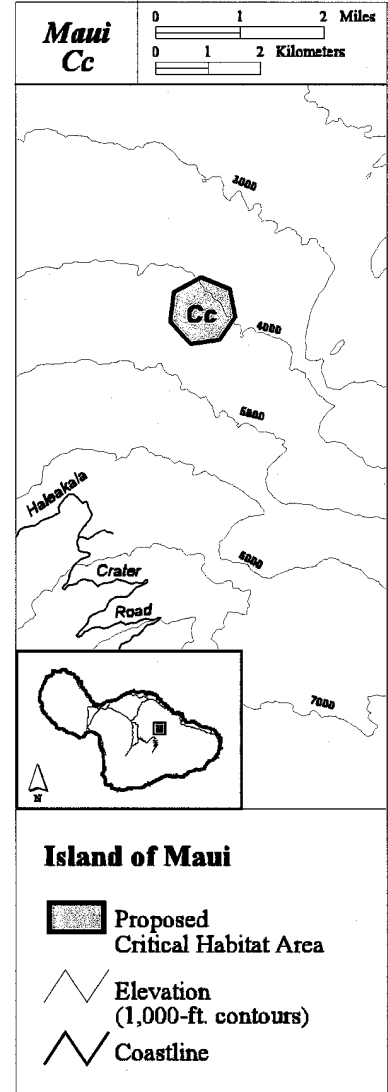
Note: Map follows:



Critical Habitat Maui Cc (117 ha; 290 ac)

Unit consists of the following seven boundary points: 789332, 2303848; 789877, 2303630; 789978, 2303093; 789690, 2302650; 789130, 2302572; 788734, 2302992; 788804, 2303568.

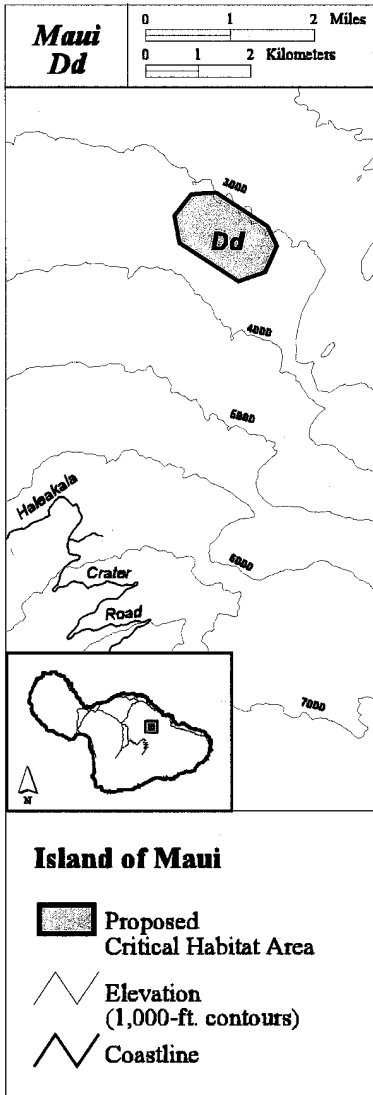
Note: Map follows:



Critical Habitat Maui Dd (213 ha; 528 ac)

Unit consists of the following eight boundary points: 789799, 2305535; 790790, 2304877; 790965, 2304501; 790745, 2304009; 790234, 2303824; 789107, 2304563; 789014, 2305084; 789332, 2305496.

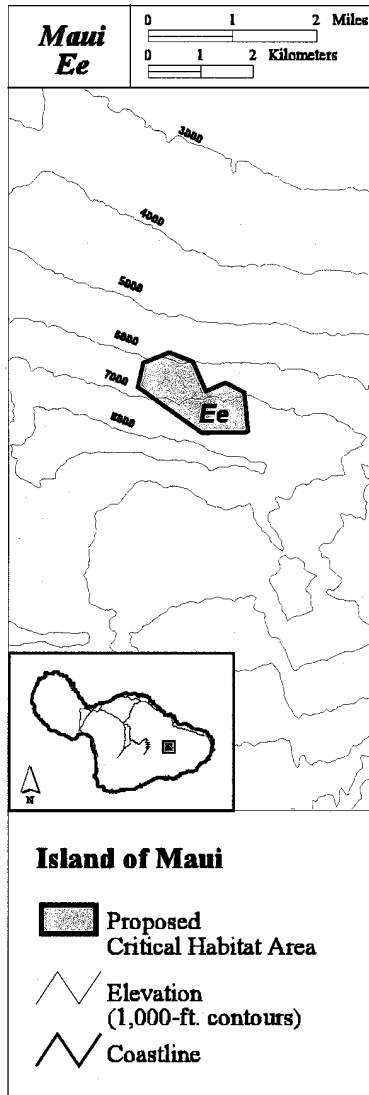
Note: Map follows:



Critical Habitat Maui Ee (188 ha; 466 ac)

Unit consists of the following eleven boundary points: 796711, 2295634; 796710, 2295635; 795482, 2296515; 795599, 2296973; 796086, 2297177; 796536, 2297003; 796794, 2296434; 797172, 2296594; 797523, 2296403; 797594, 2295645.

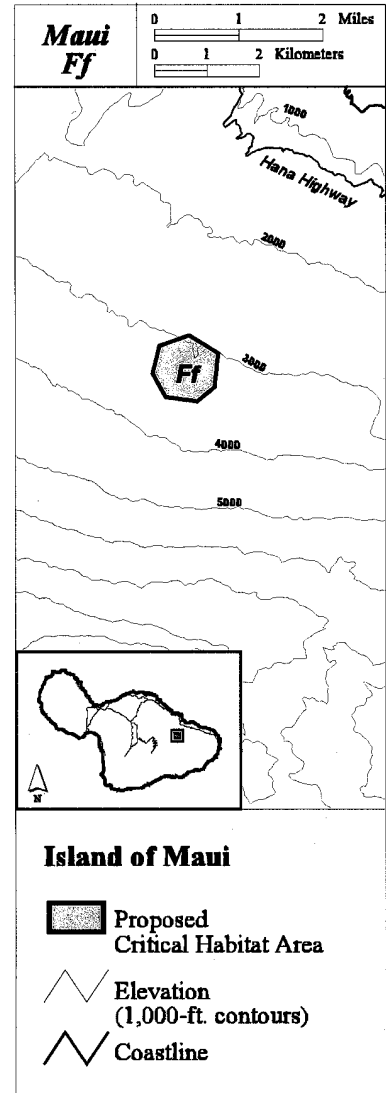
Note: Map follows:



Critical Habitat Maui Ff (119 ha; 295 ac)

Unit consists of the following seven boundary points: 797202, 2301058; 797754, 2300721; 797684, 2300057; 797349, 2299792; 796752, 2299869; 796501, 2300323; 796630, 2300861.

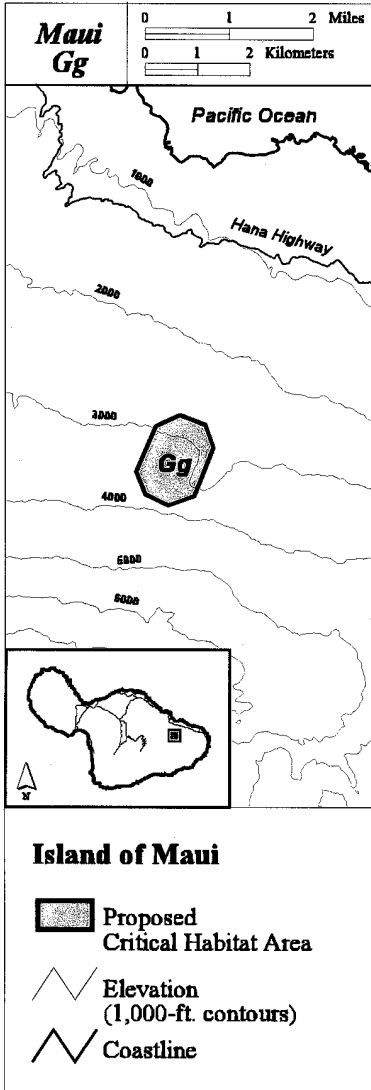
Note: Map follows:



Critical Habitat Maui Gg (177 ha; 438 ac)

Unit consists of the following eight boundary points: 800493, 2300503; 800980, 2300308; 801139, 2299872; 800770, 2298929; 800273, 2298755; 799837, 2298965; 799657, 2299406; 800037, 2300287.

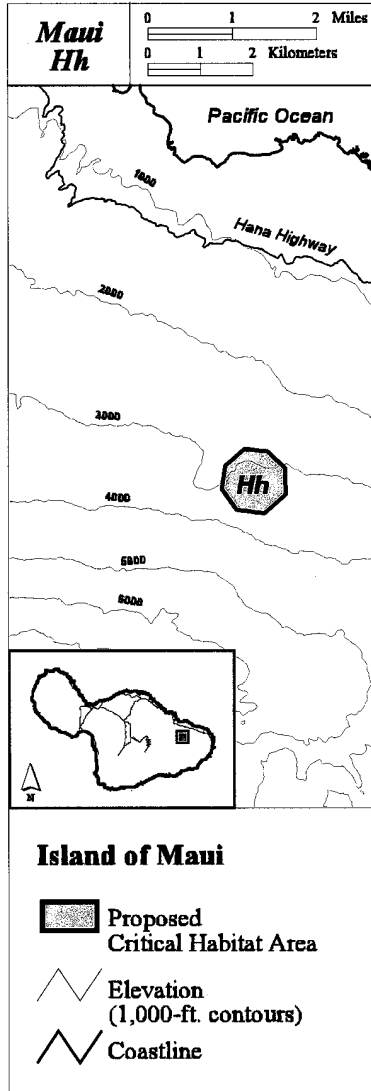
Note: Map follows:



Critical Habitat Maui Hh (117 ha; 290 ac)

Unit consists of the following eight boundary points: 802095, 2299801; 802425, 2299477; 802436, 2298965; 802041, 2298606; 801503, 2298668; 801221, 2299078; 801288, 2299532; 801656, 2299847.

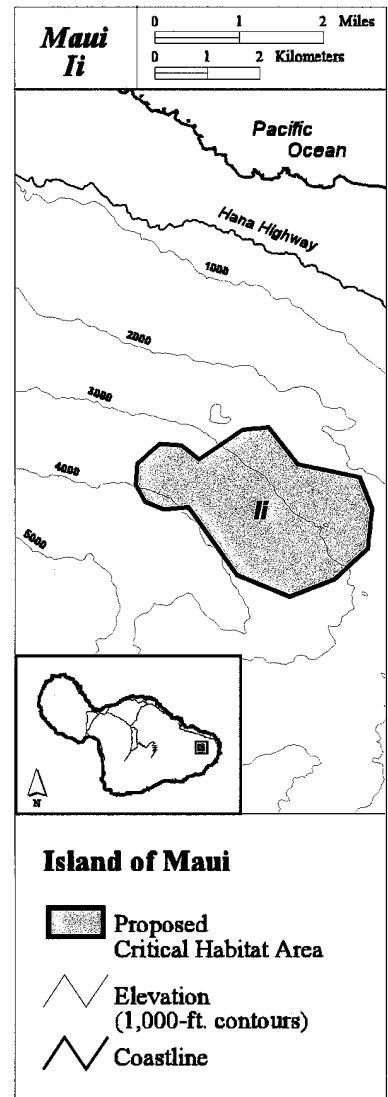
Note: Map follows:



Critical Habitat Maui Ii (879 ha; 2,177 ac)

Area consists of the following seventeen boundary points: 805238, 2298452; 805576, 2298173; 806413, 2298749; 806900, 2298797; 807464, 2298080; 808649, 2297831; 808888, 2297229; 808802, 2296455; 808162, 2295863; 807311, 2295538; 806298, 2295949; 805380, 2297248; 804885, 2297212; 804541, 2297354; 804363, 2297678; 804389, 2298093; 804817, 2298473.

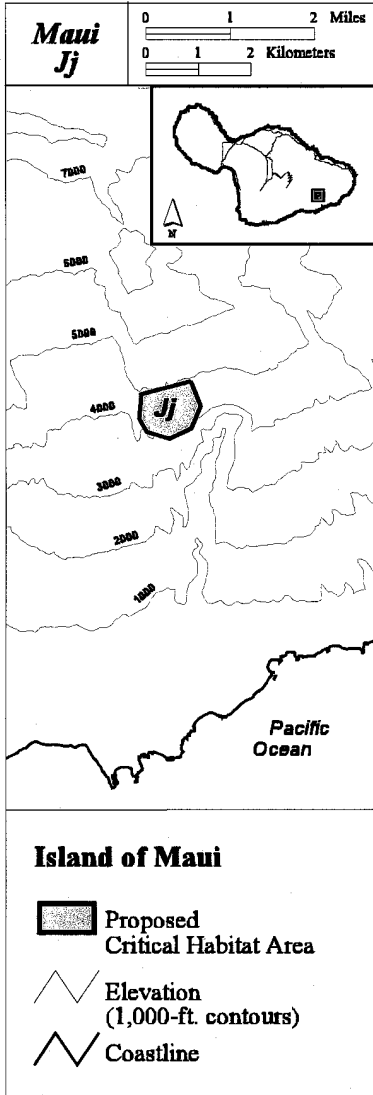
Note: Map follows:



Critical Habitat Maui Jj (93 ha; 230 ac)

Area consists of the following seven boundary points: 799552, 2290323; 799747, 2289854; 799568, 2289425; 799156, 2289228; 798721, 2289360; 798574, 2289611; 798604, 2290076.

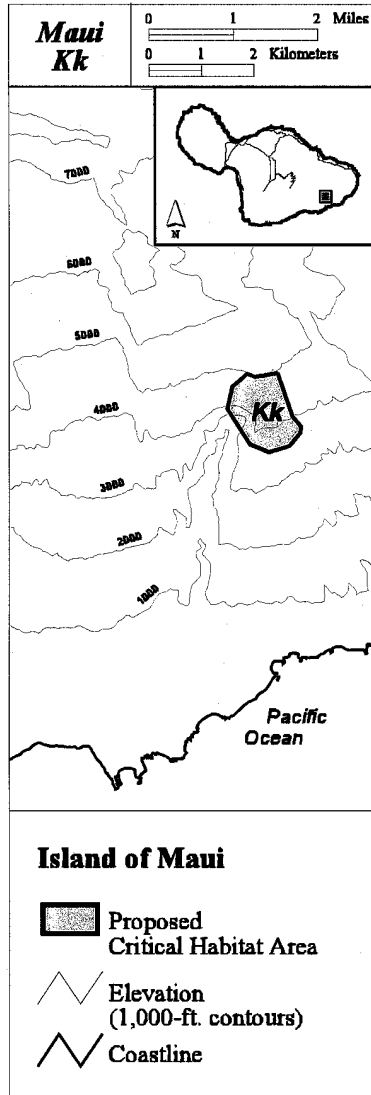
Note: Map follows:



Critical Habitat Maui Kk (144 ha; 357 ac)

Area consists of the following eleven boundary points: 801153, 2290510; 801442, 2289674; 801609, 2289474; 801598, 2289363; 801378, 2289110; 800998, 2288986; 800631, 2289145; 800196, 2289818; 800288, 2290244; 800574, 2290492; 800729, 2290430.

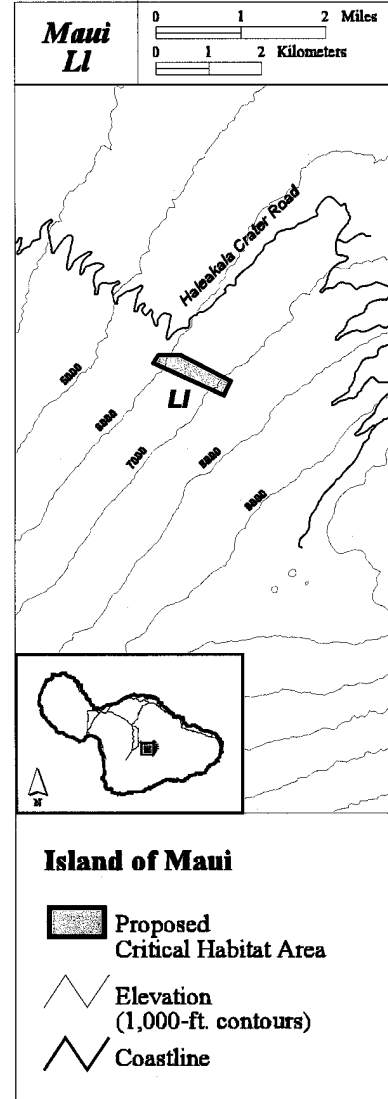
Note: Map follows:



Critical Habitat Maui Ll (45 ha; 111 ac)

Unit consists of the following five boundary points: 783589, 2296659; 784000, 2296654; 784967, 2296159; 784832, 2295889; 783494, 2296508.

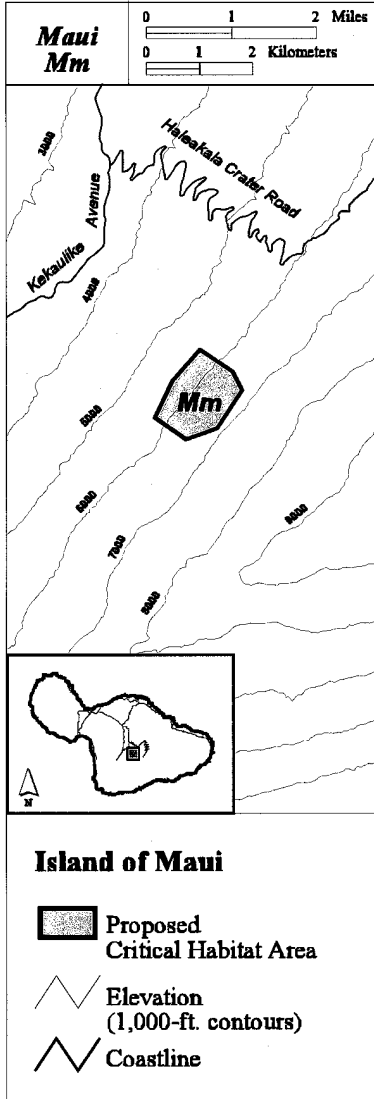
Note: Map follows:



Critical Habitat Maui Mm (167 ha; 413 ac)

Unit consists of the following seven boundary points: 782830, 2294931; 783011, 2294575; 782534, 2293852; 781957, 2293641; 781364, 2294063; 781685, 2294761; 782208, 2295353.

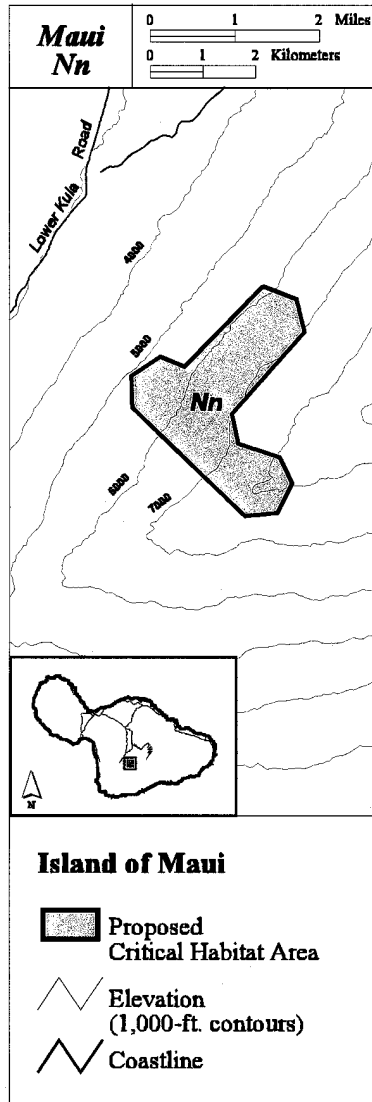
Note: Map follows:



Critical Habitat Maui Nn (692 ha; 1,714 ac)

Unit consists of the following thirteen boundary points: 781075, 2293492; 781722, 2293238; 781873, 2292610; 780491, 2291044; 780607, 2290475; 781404, 2290215; 781633, 2289724; 781347, 2289152; 780735, 2289097; 778589, 2291163; 778569, 2291767; 779128, 2292134; 779587, 2291948.

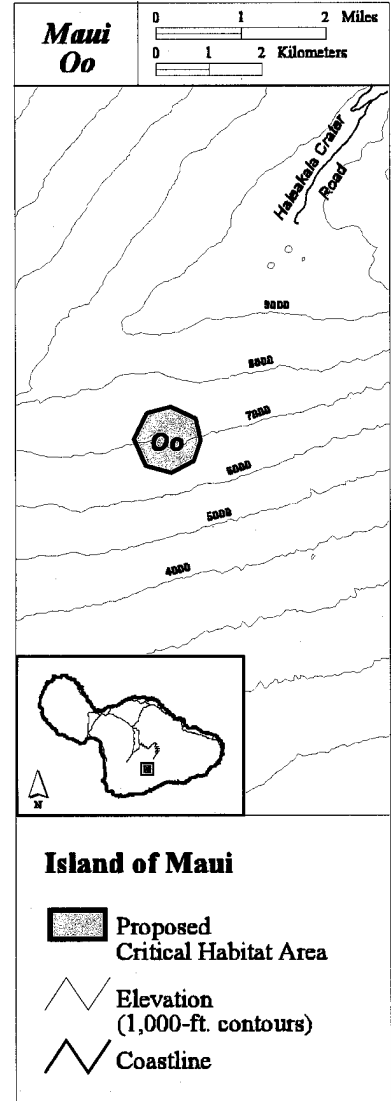
Note: Map follows:



Critical Habitat Maui Oo (116 ha; 287 ac)

Unit consists of the following eight boundary points: 783432, 2289367; 783891, 2289477; 784355, 2289252; 784455, 2288843; 784320, 2288448; 783896, 2288229; 783412, 2288353; 783182, 2288863.

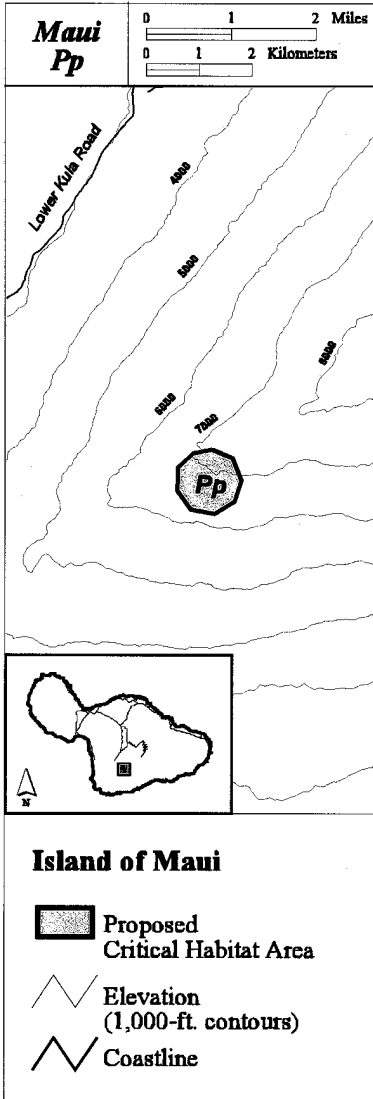
Note: Map follows:



Critical Habitat Maui Pp (113 ha; 280 ac)

Unit consists of the following nine boundary points: 779224, 2288833; 779613, 2288669; 779777, 2288242; 779648, 2287836; 779274, 2287608; 778821, 2287681; 778552, 2288052; 778584, 2288508; 778865, 2288759.

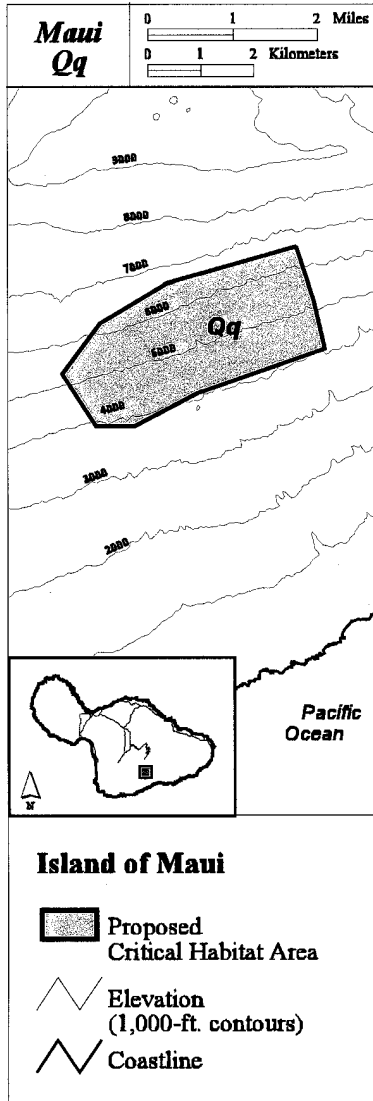
Note: Map follows:



Critical Habitat Maui Qq (973 ha; 2,410 ac)

Area consists of the following nine boundary points: 788449, 2289678; 788781, 2288670; 788991, 2287745; 786579, 2286901; 785388, 2286272; 784631, 2286272; 783991, 2287256; 784711, 2288228; 785979, 2288989.

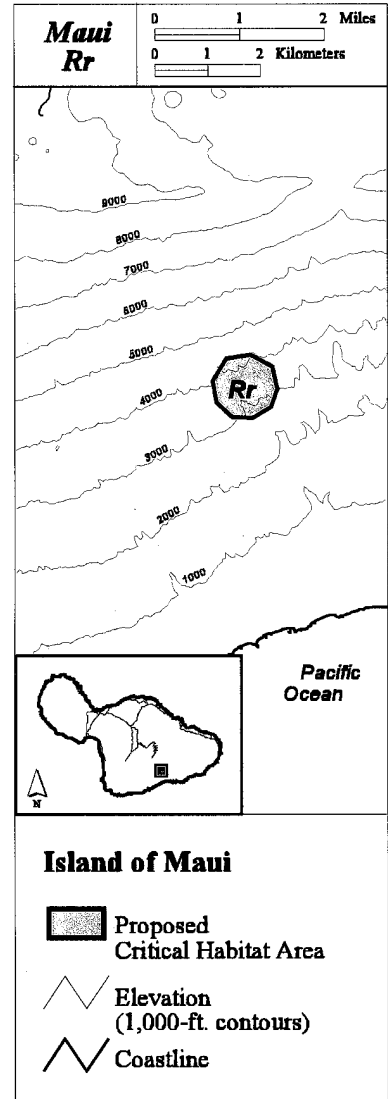
Note: Map follows:



Critical Habitat Maui Rr (115 ha; 285 ac)

Unit consists of the following nine boundary points: 790276, 2288397; 790690, 2288169; 790792, 2287741; 790666, 2287391; 790310, 2287180; 789926, 2287204; 789627, 2287483; 789552, 2287894; 789817, 2288315.

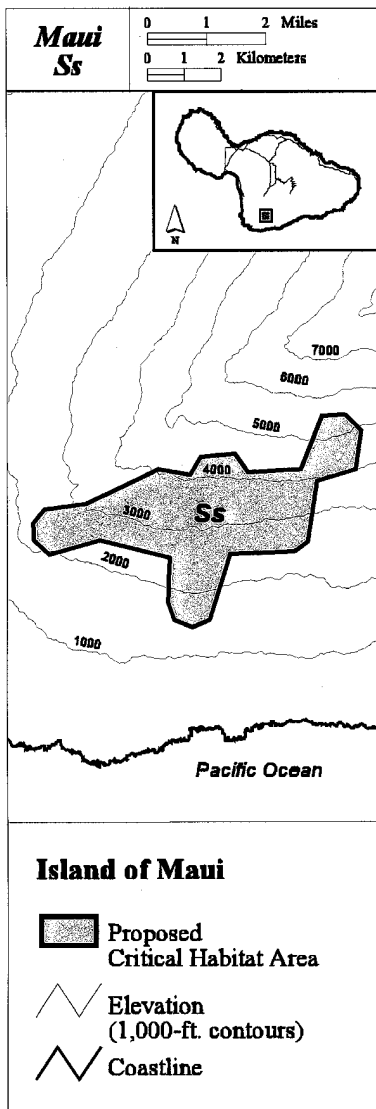
Note: Map follows:



Critical Habitat Maui Ss (1,924 ha; 4,766 ac)

Area consists of the following twenty-five boundary points: 780501, 2286848; 780927, 2286422; 780770, 2285354; 779731, 2285040; 779466, 2283384; 779123, 2283100; 777373, 2283047; 776807, 2281254; 776345, 2281058; 775844, 2281254; 775677, 2281738; 775731, 2282933; 773830, 2283419; 772456, 2283024; 772033, 2283419; 772016, 2283883; 772325, 2284261; 773463, 2284406; 775419, 2285365; 776282, 2285216; 776574, 2285704; 777509, 2285789; 777862, 2285268; 779290, 2285366; 779854, 2286823.

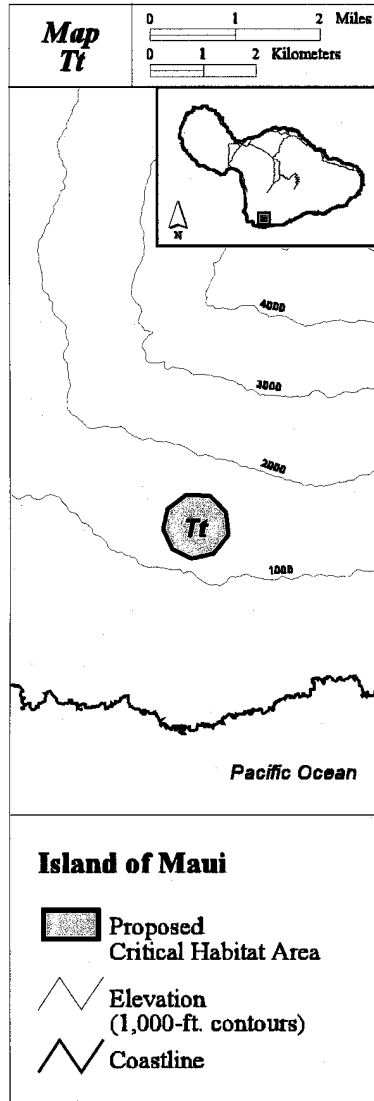
Note: Map follows:



Critical Habitat Maui Tt (114 ha; 282 ac)

Unit consists of the following nine boundary points: 774319, 2281799; 774618, 2281476; 774669, 2281046; 774382, 2280688; 773988, 2280597; 773613, 2280770; 773436, 2281145; 773519, 2281543; 773869, 2281811.

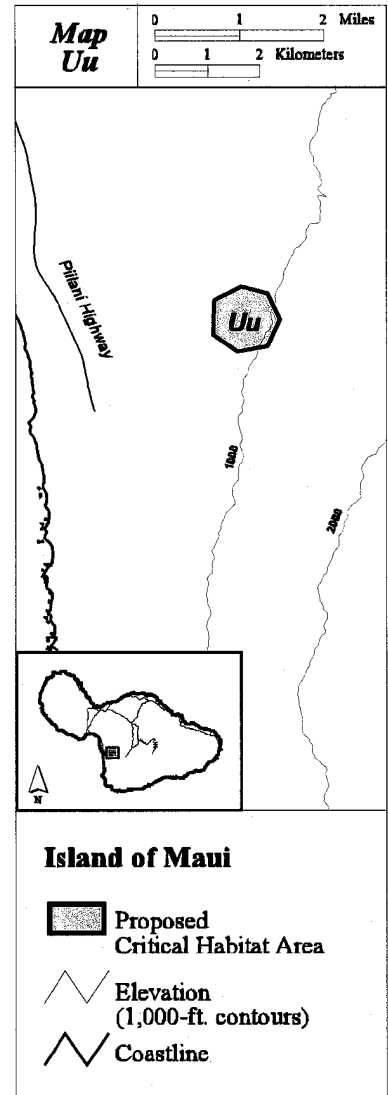
Note: Map follows:



Critical Habitat Maui Uu (121 ha; 300 ac)

Unit consists of the following seven boundary points: 769955, 2294333; 770473, 2294204; 770702, 2293706; 770473, 2293188; 769886, 2293079; 769428, 2293417; 769448, 2294075.

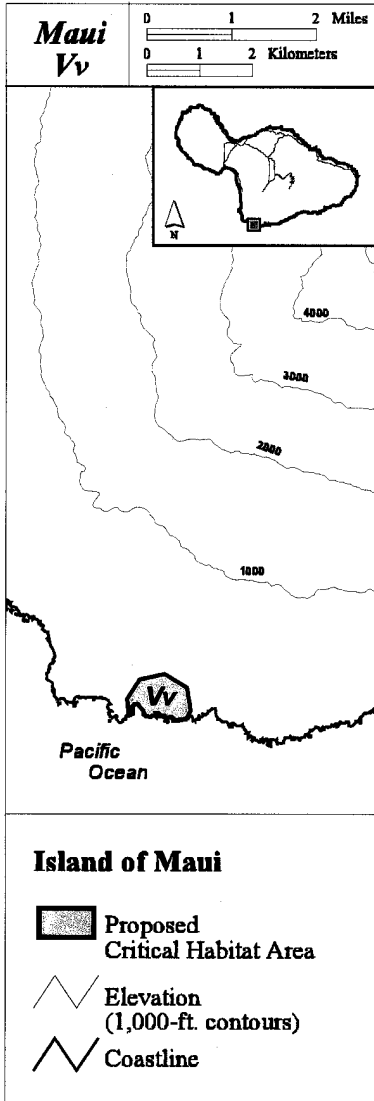
Note: Map follows:



Critical Habitat Maui Vv (77 ha; 190 ac)

Area consists of the following six points and intermediate coastline: 771083, 2278155; 771319, 2278521; 771790, 2278629; 772219, 2278359; 772290, 2277919; 772238, 2277802.

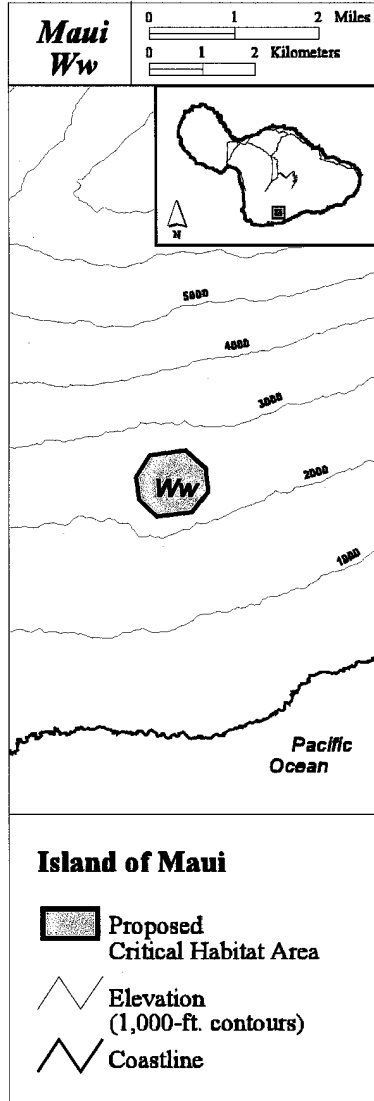
Note: Map follows:



Critical Habitat Maui Ww (133 ha; 329 ac)

Area consists of the following eight boundary points: 780044, 2283292; 780309, 2283700; 780996, 2283798; 781368, 2283449; 781414, 2282999; 781117, 2282618; 780439, 2282530; 780114, 2282850.

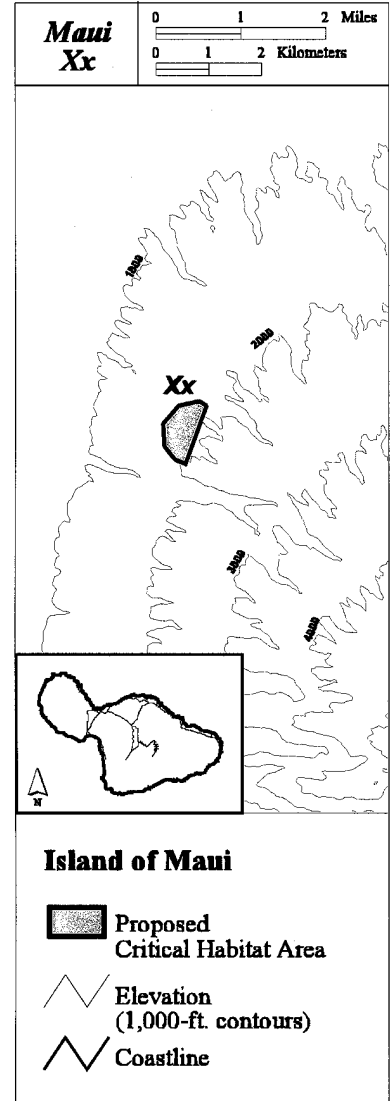
Note: Map follows:



Critical Habitat Maui Xx (60 ha; 149 ac)

Unit consists of the following seven boundary points: 746756, 2318265; 746358, 2317155; 746152, 2317238; 745959, 2317483. 745933, 2317923; 746230, 2318270; 746618, 2318351.

Note: Map follows:



Critical Habitat Maui Yy (1,118 ha; 12,769 ac)

Unit consists of the following seven boundary points: 774248, 2289989; 776203, 2289741; 777204, 2289104; 777136, 2288299; 775497, 2286508; 773256, 2285420; 772970, 2285926.

Note: Map follows:

Critical Habitat Maui Zz (118 ha; 292 ac)

Unit consists of the following seven boundary points: 746920, 2312344; 747339, 2312013; 747462, 2311502; 747063, 2311063; 746450, 2311101; 746173, 2311638; 746338, 2312122.

Note: Map follows:

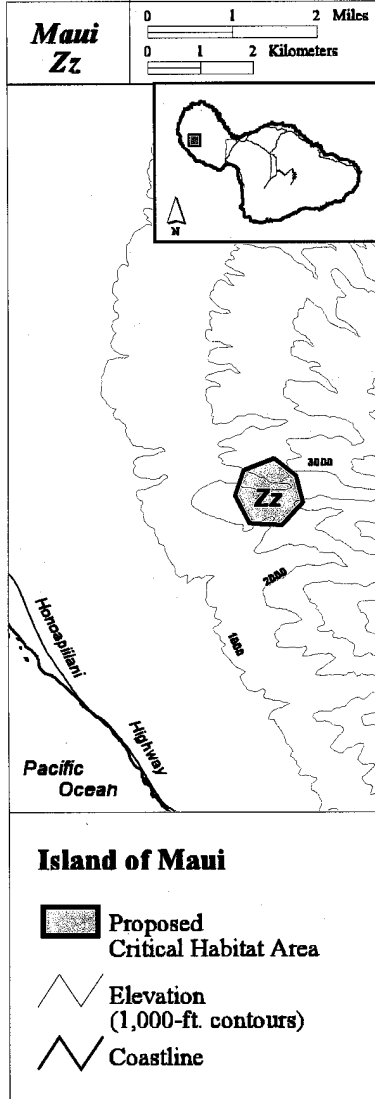
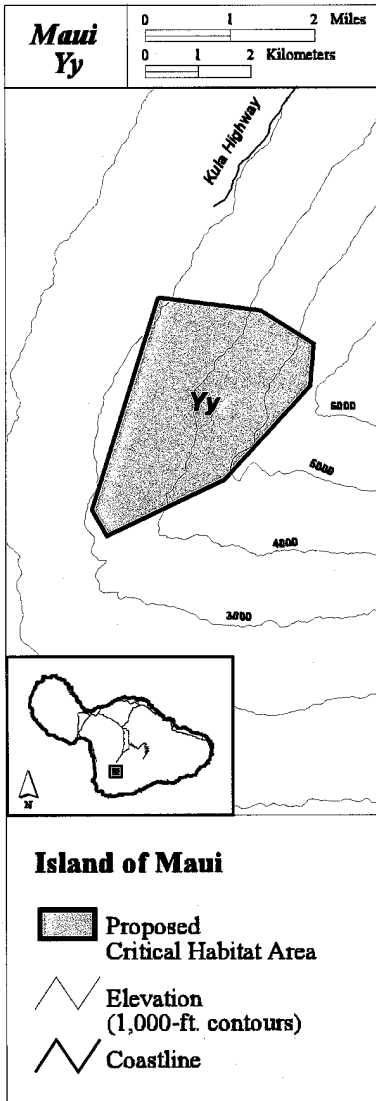


TABLE (A)(1)(i)(C).—PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT ON MAUI

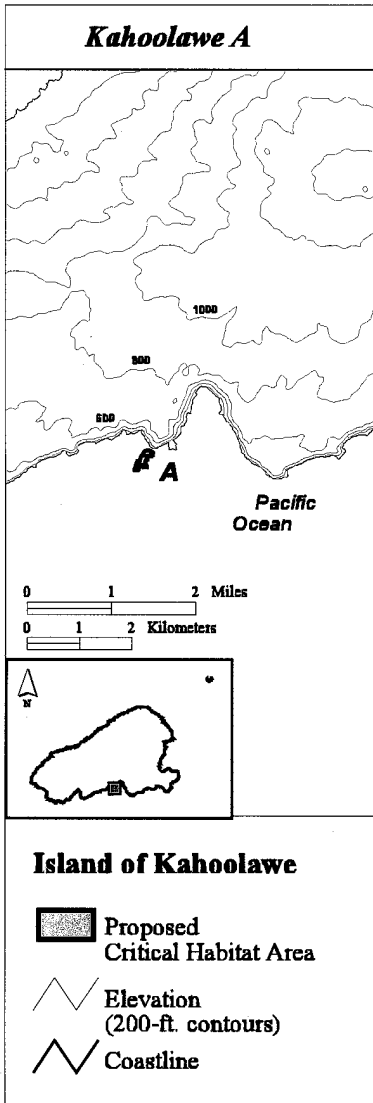
Unit name	Species
Maui A	<i>Sesbania tomentosa</i> .
Maui B	<i>Sesbania tomentosa</i> .
Maui C	<i>Sesbania tomentosa</i> .
Maui D	<i>Centaurium sebaeoides</i> and <i>Sesbania tomentosa</i> .
Maui E	<i>Centaurium sebaeoides</i> .
Maui F	<i>Centaurium sebaeoides</i> .
Maui G	<i>Ischaemum byrone</i> and <i>Peucedanum sandwicense</i> .
Maui H	<i>Ischaemum byrone</i> .
Maui I	<i>Ischaemum byrone</i> .
Maui J	<i>Mariscus pennatiflorus</i> .
Maui K	<i>Ischaemum byrone</i> .
Maui L	<i>Ischaemum byrone</i> .
Maui M	<i>Ischaemum byrone</i> .
Maui N	<i>Lipochaeta kamolensis</i> .
Maui O	<i>Bonamia menziesii</i> and <i>Hibiscus brackenridgei</i> .
Maui P	<i>Clermontia oblongifolia</i> ssp. <i>mauiensis</i> .
Maui Q	<i>Alectryon macrococcus</i> , <i>Ctenitis squamigera</i> , <i>Cyanea glabra</i> , <i>Cyanea grimesiana</i> ssp. <i>grimesiana</i> , <i>Cyanea lobata</i> , <i>Diellia erecta</i> , <i>Dubautia plantaginea</i> ssp. <i>humilis</i> , <i>Hedyotis mannii</i> , <i>Hesperomannia arbuscula</i> , <i>Lysimachia lydgatei</i> , <i>Phlegmariurus mannii</i> , <i>Plantago princeps</i> , <i>Pteris lidgatei</i> , <i>Sanicula purpurea</i> , and <i>Tetramolopium capillare</i> .
Maui R	<i>Hesperomannia arbuscula</i> and <i>Sanicula purpurea</i> .
Maui S	<i>Sanicula purpurea</i> .
Maui T	<i>Ctenitis squamigera</i> , <i>Diellia erecta</i> , <i>Neraudia sericea</i> , <i>Platanthera holochila</i> , and <i>Remya mauiensis</i> .
Maui U	<i>Spermolepis hawaiiensis</i> .
Maui V	<i>Hibiscus brackenridgei</i> .
Maui W	<i>Phlegmariurus mannii</i> and <i>Sanicula purpurea</i> .
Maui X	<i>Hedyotis coriacea</i> , <i>Hibiscus brackenridgei</i> , <i>Sesbania tomentosa</i> , and <i>Spermolepis hawaiiensis</i> .
Maui Y	<i>Cyrtandra munroi</i> .
Maui Z	<i>Hesperomannia arborescens</i> .
Maui Aa	<i>Pteris lidgatei</i> .
Maui Bb	<i>Cyanea copelandii</i> ssp. <i>haleakalaensis</i> and <i>Cyanea mceldowneyi</i> .
Maui Cc	<i>Cyanea hamatiflora</i> ssp. <i>hamatiflora</i> .
Maui Dd	<i>Cyanea hamatiflora</i> ssp. <i>hamatiflora</i> and <i>Cyanea mceldowneyi</i> .
Maui Ee	<i>Geranium multiflorum</i> .
Maui Ff	<i>Cyanea hamatiflora</i> ssp. <i>hamatiflora</i> .
Maui Gg	<i>Cyanea copelandii</i> ssp. <i>haleakalaensis</i> and <i>Cyanea mceldowneyi</i> .
Maui Hh	<i>Clermontia samuelii</i> and <i>Cyanea mceldowneyi</i> .
Maui Ii	<i>Clermontia samuelii</i> .
Maui Jj	<i>Phlegmariurus mannii</i> .
Maui Kk	<i>Cyanea hamatiflora</i> ssp. <i>hamatiflora</i> and <i>Phlegmariurus mannii</i> .
Maui Ll	<i>Geranium arboreum</i> .
Maui Mm	<i>Geranium arboreum</i> .
Maui Nn	<i>Geranium arboreum</i> .
Maui Oo	<i>Bidens micrantha</i> ssp. <i>kalealaha</i> .
Maui Pp	<i>Geranium arboreum</i> .
Maui Qq	<i>Bidens micrantha</i> ssp. <i>kalealaha</i> ; <i>Clermontia lindseyana</i> , <i>Diellia erecta</i> , <i>Diplazium molokaiense</i> , <i>Neraudia sericea</i> , <i>Phlegmariurus mannii</i> , and <i>Phyllostegia mollis</i> .
Maui Rr	<i>Alectryon macrococcus</i> .
Maui Ss	<i>Alectryon macrococcus</i> , <i>Bonamia menziesii</i> , <i>Cenchrus agrimonioides</i> , <i>Colubrina oppositifolia</i> , <i>Flueggea neowawraea</i> , <i>Melicope adscendens</i> , <i>Melicope knudsenii</i> , <i>Melicope mucronulata</i> , <i>Spermolepis hawaiiensis</i> , and <i>Zanthoxylum hawaiiense</i> .
Maui Tt	<i>Sesbania tomentosa</i> .
Maui Uu	<i>Hibiscus brackenridgei</i> .
Maui Vv	<i>Vigna o-wahuensis</i> .
Maui Ww	<i>Flueggea neowawraea</i> .
Maui Xx	<i>Ctenitis squamigera</i> .
Maui Yy	<i>Clermontia lindseyana</i> .
Maui Zz	<i>Ctenitis squamigera</i> .

(D) *Kahoolawe*. Critical habitat units are described below. Coordinates are in UTM Zone 4 with units in meters using North American Datum of 1983 (NAD83).

Critical Habitat Kahoolawe A (5 ha; 12 ac)

Unit consists of the entire islet, located at UTM coordinate 749248, 2269914.

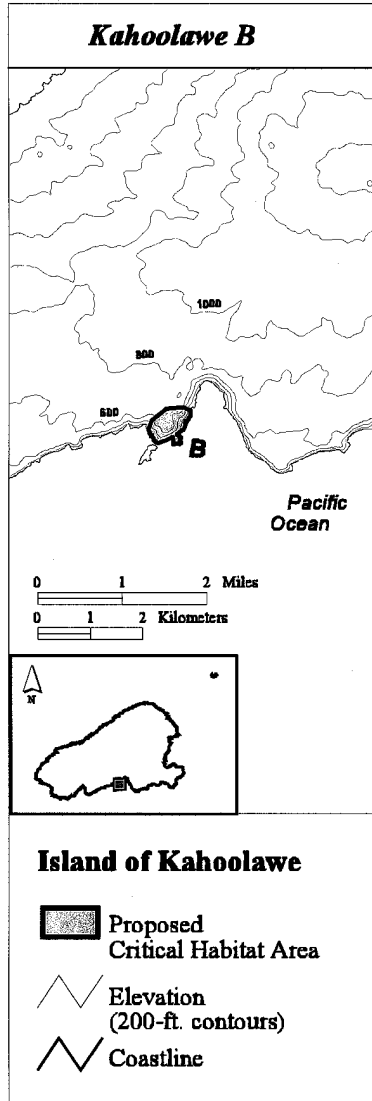
Note: Map follows:



Critical Habitat Kahoolawe B (38 ha; 94 ac)

Unit consists of the following five boundary points: 749258, 2270360; 749316, 2270548; 749609, 2270771; 749934, 2270789; 750070, 2270730.

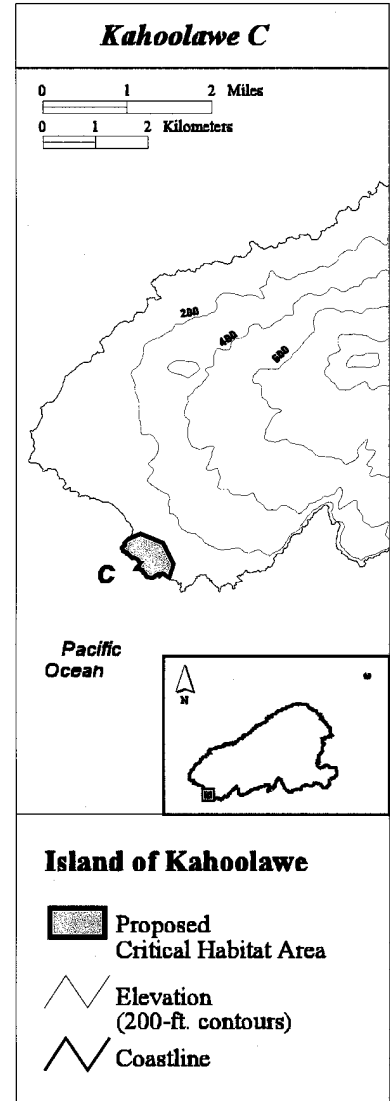
Note: Map follows:



Critical Habitat Kahoolawe C (50 ha; 124 ac)

Unit consists of the following five boundary points: 741673, 2269672; 741903, 2269761; 742323, 2269587; 742526, 2269182; 742449, 2268925.

Note: Map follows:



Critical Habitat Kahoolawe D (114 ha; 282 ac)

Unit consists of the following eight boundary points: 745602, 2274210; 745392, 2273720; 744942, 2273560; 744467, 2273770; 744329, 2274239; 744543, 2274682; 744977, 2274799; 745382, 2274666.

Note: Map follows:

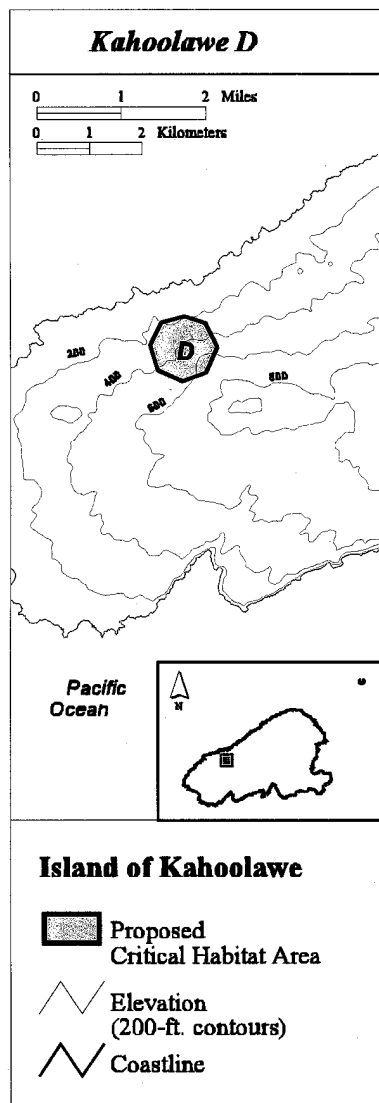


TABLE (A)(1)(i)(D).—PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT ON KAHOOLAWA

Unit name	Species
Kahoolawe A	<i>Sesbania tomentosa</i> .
Kahoolawe B	<i>Kanaloa kahoolawensis</i> .
Kahoolawe C	<i>Vigna o-wahuensis</i> .
Kahoolawe D	<i>Vigna o-wahuensis</i> .

(ii) Hawaiian plants—Constituent elements.

(A) Flowering plants.

Family Apiaceae: *Peucedanum sandwicense* (makou)

i. Kauai F, G, I, and M, identified in the legal descriptions in paragraph (a)(1)(i)(A) of this section, constitute critical habitat for *Peucedanum sandwicense* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Cliff habitats (a) in mixed shrub coastal dry cliff communities or diverse mesic forest and (b) containing one or more of the following associated native plant species: *Hibiscus kokio*, *Brighamia insignis*, *Bidens* sp., *Artemisia* sp., *Lobelia niihauensis*, *Wilkesia gymnoxiphium*, *Canthium odoratum*, *Dodonaea viscosa*, *Psychotria* sp., *Acacia koa*, *Kokio kauaiensis*, *Carex meyenii*, *Panicum lineale*, *Chamaesyce celastroides*, *Eragrostis* sp., *Diospyros* sp., or *Metrosideros polymorpha*; and (2) elevations from sea level to above 915 m (3,000 ft).

ii. Maui unit G, identified in the legal description in paragraph (a)(1)(i)(C) of this section, of this section constitutes critical habitat for *Peucedanum sandwicense* on Maui. Within this unit the currently known primary constituent elements of critical habitat for *Peucedanum sandwicense* on Maui are habitat components that provide: (1) cliff habitats containing one or more of the following associated native species: *Chamaesyce* sp., *Eragrostis* sp., *Diospyros* sp., or *Metrosideros polymorpha*; and (2) elevations from sea level to above 900 m (2,950 ft).

Family Apiaceae: *Sanicula purpurea* (No Common Name)

Maui units Q, R, S, and W, identified in the legal descriptions in paragraph (a)(1)(i)(C) of this section, constitute critical habitat for *Sanicula purpurea* on Maui. Within these units the currently known primary constituent elements of critical habitat for *Sanicula purpurea* on Maui are the habitat components that provide: (1) Open *Metrosideros polymorpha* mixed montane bogs containing one or more of the following associated plant taxa: *Styphelia tameiameia*, *Gahnia beechyi*, *Geranium humile*, *Myrsine vaccinioides*, *Viola mauiensis*, *Argyroxiphium caliginis*, *Plantago pachyphylla*, *Lycopodium* sp., *Argyroxiphium grayanum*, *Lagenifera mauiensis*, *Machaerina* sp., or *Oreobolus furcatus*; and (2) elevations between 1,000 and 1,620 m (3,280 and 5,330 ft).

Family Apiaceae: *Spermolepis hawaiiensis* (No Common Name)

i. Kauai B and I, identified in the legal descriptions in paragraph (a)(1)(i)(A) of this section, constitute critical habitat for *Spermolepis hawaiiensis* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) *Metrosideros polymorpha* forests or *Dodonaea viscosa* lowland dry shrubland containing one or more of the following associated plant species: *Eragrostis variabilis*, *Bidens sandwicensis*, *Schiedea spergulina*, *Lipochaeta* sp., *Cenchrus agrimonioides*, *Sida fallax*, *Doryopteris* sp., or *Gouania hillebrandii*; and (2) elevations of about 305 to 610 m (1,000 to 2,000 ft).

ii. Maui units U and Ss, identified in the legal descriptions in paragraph (a)(1)(i)(C) of this section, constitute critical habitat for *Spermolepis hawaiiensis* on Maui. Within these units the currently known primary constituent elements of critical habitat for *Spermolepis hawaiiensis* on Maui are the habitat components that provide: (1) Shady spots (a) in *Dodonaea viscosa* lowland dry shrubland and (b) containing one or more of the following associated native species: *Eragrostis variabilis*, *Wikstroemia* sp., *Erythrina sandwicensis*, *Diospyros* sp., *Pleomele* sp., *Lipochaeta livarum*, *Sida fallax*, *Myoporum sandwicensis*, *Santalum ellipticum*, or *Heteropogon contortus*; and (2) elevations of 300 to 550 m (980 to 1,800 ft).

Family Apocynaceae: *Pteralyxia kauaiensis* (Kaulu)

Kauai F, G, I, M, Q, T, and U, identified in the legal descriptions in paragraph (a)(1)(i)(A) of this section, constitute critical habitat for *Pteralyxia kauaiensis* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Diverse mesic or wet forests containing one or more of the following associated plant taxa: *Pisonia sandwicensis*, *Euphorbia haeleleana*, *Charpentiera elliptica*, *Pipturus* sp., *Neraudia kauaiensis*, *Hedyotis terminalis*, *Pritchardia* sp., *Gardenia remyi*, *Syzygium* sp., *Pleomele* sp., *Cyanea* sp., *Hibiscus* sp., *Kokia kauaiensis*, *Alectryon macrococcus*, *Canthium odoratum*, *Nestegis sandwicensis*, *Bobea timonioides*, *Rauvolfia sandwicensis*, *Nesoluma polynesicum*, *Myrsine lanaiensis*, *Caesalpinia kauaiensis*, *Tetraplasandra* sp., *Acacia koa*, *Styphelia tameiameia*, *Dodonaea viscosa*, *Gahnia* sp., *Freycinetia arborea*,

Psychotria mariniana, *Diplazium sandwichianum*, *Zanthoxylum dipetalum*, *Carex* sp., *Delissea* sp., *Xylosma hawaiiense*, *Alphitonia ponderosa*, *Santalum freycinetianum*, *Antidesma* sp., *Diospyros* sp., *Metrosideros polymorpha*, *Dianella sandwicensis*, *Poa sandwicensis*, *Schiedea stellarioides*, *Peperomia macraeana*, *Claoxylon sandwicense*, or *Pouteria sandwicensis*; and (2) elevations between 250 to 610 m (820 to 2,000 ft).

Family Araliaceae: *Munroidendron racemosum* (No Common Name)

Kauai G, I, M, and N, identified in the legal descriptions in paragraph (a)(1)(i)(A) of this section, constitute critical habitat for *Munroidendron racemosum* on Kauai. Within these units the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Steep exposed cliffs or ridge slopes (a) in coastal or lowland mesic forest and (b) containing one or more of the following associated plant taxa: *Pisonia umbellifera*, *Canavalia galeata*, *Sida fallax*, *Brighamia insignis*, *Canthium odoratum*, *Psychotria* sp., *Nestegis sandwicensis*, *Tetraplasandra* sp., *Bobea timonioides*, *Rauvolfia sandwicensis*, *Pleomele* sp., *Pouteria sandwicensis*, or *Diospyros* sp.; and (2) elevations between 120 to 400 m (395 to 1,310 ft).

Family Asteraceae: *Bidens micrantha* ssp. *kalealaha* (Ko'oko'olau)

Maui units Oo and Qq, identified in the legal descriptions in paragraph (a)(1)(i)(C) of this section, constitute critical habitat for *Bidens micrantha* ssp. *kalealaha* on Maui. Within these units the currently known primary constituent elements of critical habitat for *Bidens micrantha* ssp. *kalealaha* on Maui are the habitat components that provide: (1) Blocky lava flows with little or no soil development, deep pit craters, or sheer rock walls (a) in open canopy *Metrosideros polymorpha*-*Acacia koa* forest, montane shrubland, or cliff faces; and (b) containing one or more of the following associated native plant species: *Styphelia tameiameia*, *Coprosma montana*, *Dodonaea viscosa*, *Lysimachia remyi*, *Viola chamissoniana*, *Dubautia menziesii*, or *Dubautia platyphylla*; and (2) elevations of 1,600 to 2,300 m (5,250 to 7,550 ft).

Family Asteraceae: *Dubautia latifolia* (Na'ena'e)

Kauai G and I, identified in the legal descriptions in paragraph (a)(1)(i)(A) of this section, constitute critical habitat for *Dubautia latifolia* on Kauai. Within

these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Gentle or steep slopes on well drained soil in (a) semi-open or closed, diverse montane mesic forest dominated by *Acacia koa* and/or *Metrosideros polymorpha* and (b) containing one or more of the following native plant species: *Pouteria sandwicensis*, *Dodonaea viscosa*, *Nestegis sandwicensis*, *Diplazium sandwichianum*, *Elaeocarpus bifidus*, *Claoxylon sandwicense*, *Bobea* sp., *Pleomele* sp., *Antidesma* sp., *Cyrtandra* sp., *Xylosma* sp., *Alphitonia ponderosa*, *Coprosma waimeae*, *Dicranopteris linearis*, *Hedyotis terminalis*, *Ilex anomala*, *Melicope anisata*, *Psychotria mariniana*, or *Scaevola* sp.; and (2) elevations between 800 to 1,220 m (2,625 to 4,000 ft).

Family Asteraceae: *Dubautia pauciflorula* (Na'ena'e)

Kauai L, identified in the legal description in paragraph (a)(1)(i)(A) of this section, description above, constitutes critical habitat for *Dubautia pauciflorula* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Lowland wet forest within stream drainages; and (2) elevations between 670–700 m (2,200–2,300 ft).

Family Asteraceae: *Dubautia plantaginea* ssp. *humilis* (Na'ena'e)

Maui unit Q, identified in the legal description in paragraph (a)(1)(i)(C) of this section, constitutes critical habitat for *Dubautia plantaginea* ssp. *humilis* on Maui. Within this unit the currently known primary constituent elements of critical habitat for *Dubautia plantaginea* ssp. *humilis* on Maui are the habitat components that provide: (1) Wet, barren, steep, rocky, wind-blown cliffs containing one or more of the following associated native plant species: *Metrosideros polymorpha*, *Pipturus albidus*, *Eragrostis variabilis*, *Carex* sp., *Hedyotis formosa*, *Lysimachia remyi*, *Bidens* sp., *Pritchardia* sp., or *Plantago princeps*; and (2) elevations between 350 to 400 m (1,150 to 1,300 ft).

Family Asteraceae: *Hesperomannia arborescens* (No Common Name)

Maui unit Z, identified in the legal description in paragraph (a)(1)(i)(C) of this section, constitutes critical habitat for *Hesperomannia arborescens* on Maui. Within this unit the currently known primary constituent elements of critical habitat for *Hesperomannia arborescens* on Maui are the habitat components that provide: (1) Slopes or

ridges (a) in lowland mesic or wet forest and (b) containing one or more of the following associated native plant species: *Metrosideros polymorpha*, *Myrsine sandwicensis*, *Isachne distichophylla*, *Pipturus* sp., *Antidesma* sp., *Psychotria* sp., *Clermontia* sp., *Cibotium* sp., *Dicranopteris linearis*, *Bobea* sp., *Coprosma* sp., *Sadleria* sp., *Melicope* sp., *Machaerina* sp., *Cheirodendron* sp., or *Freycinetia arborea*; and (2) elevations between 360 and 750 m (1,180 and 2,460 ft).

Family Asteraceae: *Hesperomannia arbuscula* (No Common Name)

Maui units Q and R, identified in the legal descriptions in paragraph (a)(1)(i)(C) of this section, constitute critical habitat for *Hesperomannia arbuscula* on Maui. Within these units the currently known primary constituent elements of critical habitat for *Hesperomannia arbuscula* on Maui are the habitat components that provide: (1) Slopes and ridges (a) in mesic or wet forest dominated by *Acacia koa* and *Metrosideros polymorpha* and (b) containing one or more of the following associated native plant species: *Bidens* sp., *Tetraplasandra* sp., *Alyxia oliviformis*, or *Psychotria* sp.; and (2) elevation between 350 to 900 m (1,150 to 2,950 ft).

Family Asteraceae: *Hesperomannia lydgatei* (No Common Name)

Kauai F, L, and P, identified in the legal descriptions in paragraph (a)(1)(i)(A) of this section, constitute critical habitat for *Hesperomannia lydgatei* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Stream banks with rich brown soil and silty clay (a) in *Metrosideros polymorpha* or *Metrosideros polymorpha*-*Dicranopteris linearis* lowland wet forest and (b) containing one or more of the following associated native plant species: *Adenophorus* sp., *Antidesma* sp., *Broussaisia arguta*, *Cheirodendron* sp., *Elaphoglossum* sp., *Freycinetia arborea*, *Hedyotis terminalis*, *Labordia lydgatei*, *Machaerina angustifolia*, *Peperomia* sp., *Pritchardia* sp., *Psychotria hexandra*, and *Syzygium sandwicensis*; and (2) elevations between 410–915 m (1,345–3,000 ft).

Family Asteraceae: *Lipochaeta fauriei* (Nehe)

Kauai G, I, and U, identified in the legal descriptions in paragraph (a)(1)(i)(A) of this section, constitute critical habitat for *Lipochaeta fauriei* on Kauai. Within these units, the currently

known primary constituent elements of critical habitat are habitat components that provide: (1) Moderate shade to full sun on the sides of steep gulches (a) in diverse lowland mesic forests and (b) containing one or more of the following native species: *Diospyros* sp., *Myrsine lanaiensis*, *Euphorbia haeleleana*, *Acacia koa*, *Pleomele aurea*, *Sapindus oahuensis*, *Nestegis sandwicensis*, *Dodonaea viscosa*, *Psychotria mariniana*, *Psychotria greenwelliae*, *Kokia kauaiensis*, or *Hibiscus waimeae*; and (2) elevations between 480 and 900 m (1,575 and 2,950 ft).

Family Asteraceae: *Lipochaeta kamolensis* (Nehe)

Maui unit N, identified in the legal description in paragraph (a)(1)(i)(C) of this section, constitutes critical habitat for *Lipochaeta kamolensis* on Maui. Within this unit the currently known primary constituent elements of critical habitat for *Lipochaeta kamolensis* on Maui are the habitat components that provide: (1) Bottoms of rock ledges (a) in dry to mesic scrub or dry lowland forest and (b) containing one or more of the following associated native plant species: *Dodonaea viscosa*, *Plumbago zeylanica*, or *Ipomoea indica*; and (2) elevations between 219 to 250 m (720 to 820 ft).

Family Asteraceae: *Lipochaeta micrantha* (Nehe)

i. Kauai I and M, identified in the legal descriptions in paragraph (a)(1)(i)(A) of this section, constitute critical habitat for *Lipochaeta micrantha* on Kauai. Within these units the currently known primary constituent elements of critical habitat for *Lipochaeta micrantha* var. *exigua* are habitat components that provide: (1) Cliffs, ridges, or slopes (a) in grassy, shrubby or dry mixed communities and (b) containing one or more of the following associated native plant species: *Artemisia australis*, *Bidens sandwicensis*, *Plectranthus parviflorus*, *Chamaesyce celastroides*, *Diospyros* sp., *Canthium odoratum*, *Neraudia* sp., *Pipturus* sp., *Hibiscus kokio*, *Sida fallax*, *Eragrostis* sp., or *Lepidium bidentatum*; and (2) elevations between 305–430 m (1,000–1,400 ft).

ii. Within these units, the currently known primary constituent elements of critical habitat for *Lipochaeta micrantha* var. *micrantha* are habitat components that provide: (1) Basalt cliffs, stream banks, or level ground (a) in mesic or diverse *Metrosideros polymorpha-Diospyros* sp. forest and (b) containing one or more of the following associated native plant species: *Lobelia niihauensis*, *Chamaesyce celastroides*

var. *hanapepensis*, *Neraudia kauaiensis*, *Rumex* sp., *Nontrichium* sp. (kului), *Artemisia* sp., *Dodonaea viscosa*, *Antidesma* sp., *Hibiscus* sp., *Xylosma* sp., *Pleomele* sp., *Melicope* sp., *Bobea* sp., and *Acacia koa*; and (2) elevations between 610–720 m (2,000–2,360 ft).

Family Asteraceae: *Lipochaeta waimeensis* (Nehe)

Kauai B, identified in the legal description in paragraph (a)(1)(i)(A) of this section, constitutes critical habitat for *Lipochaeta waimeensis* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Precipitous, shrub-covered gulch (a) in diverse lowland forest and (b) containing the native species *Dodonaea viscosa* or *Lipochaeta connata*; and (2) elevations between 350 and 400 m (1,150 and 1,310 ft).

Family Asteraceae: *Remya kauaiensis* (No Common Name)

Kauai G, I, and U, identified in the legal descriptions in paragraph (a)(1)(i)(A) of this section, constitute critical habitat for *Remya kauaiensis* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Steep, north or northeast facing slopes (a) in *Acacia koa-Metrosideros polymorpha* lowland mesic forest and (b) containing one or more of the following associated native plant species: *Chamaesyce* sp., *Nestegis sandwicensis*, *Diospyros* sp., *Hedyotis terminalis*, *Melicope* spp., *Pouteria sandwicensis*, *Schiedea membranacea*, *Psychotria mariniana*, *Dodonaea viscosa*, *Dianella sandwicensis*, *Tetraplasandra kauaiensis*, or *Claoxylon sandwicensis*; and (2) elevations between 850 to 1,250 m (2,800 to 4,100 ft).

Family Asteraceae: *Remya mauiensis* (No Common Name)

Maui unit T, identified in the legal description in paragraph (a)(1)(i)(C) of this section, constitutes critical habitat for *Remya mauiensis* on Maui. Within this unit the currently known primary constituent elements of critical habitat for *Remya mauiensis* on Maui are the habitat components that provide: (1) Steep, north or northeast-facing slopes (a) in mixed mesophytic forests or *Metrosideros polymorpha* montane wet forests and (b) containing one or more of the following associated native species: *Diospyros sandwicensis*, *Xylosma hawaiiense*, *Nestegis sandwicensis*, *Myrsine lessertiana*, *Wikstroemia* sp., *Dodonaea viscosa*,

Diplazium sandwichianum, *Lysimachia renyi*, *Microlepis strigosa*, *Melicope* sp., *Alyxia oliviformis*, *Pleomele auwahiensis*, *Psychotria mariniana*, *Ctenitis squamigera*, or *Styphelia tameiameiae*; and (2) elevations between 850 and 1,250 m (2,800 and 4,100 ft).

Family Asteraceae: *Remya montgomeryi* (No Common Name)

Kauai G and I, identified in the legal descriptions in paragraph (a)(1)(i)(A) of this section, constitute critical habitat for *Remya montgomeryi* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Steep, north or northeast-facing slopes, cliffs, or stream banks near waterfalls (a) in *Metrosideros polymorpha mixed mesic forest* and (b) containing one or more of the following associated native plant species: *Lysimachia glutinosa*, *Lepidium serra*, *Boehmeria grandis*, *Poa mannii*, *Stenogyne campanulata*, *Myrsine linearifolia*, *Bobea timonioides*, *Ilex anomala*, *Zanthoxylum dipetalum*, *Claoxylon sandwicensis*, *Tetraplasandra* spp., *Artemisia* sp., *Nototrichium* sp., *Cyrtandra* sp., *Dubautia plantaginea*, *Sadleria* sp., *Cheirodendron* sp., *Scaevola* sp., or *Pleomele* sp.; and (2) elevations between 850 to 1,250 m (2,800 to 4,100 ft).

Family Asteraceae: *Tetramolopium capillare* (Pamakani)

Maui unit Q, identified in the legal description in paragraph (a)(1)(i)(C) of this section, constitutes critical habitat for *Tetramolopium capillare* on Maui. Within this unit the currently known primary constituent elements of critical habitat for *Tetramolopium capillare* on Maui are the habitat components that provide: (1) Rocky substrates (a) in *Heteropogon contortus* lowland dry forest and (b) containing one or more of the following associated native plants: *Dodonaea viscosa*, or *Myoporum sandwicense*; or (c) in *Metrosideros polymorpha-Styphelia tameiameiae* montane mesic or wet shrubland and (d) containing one or more of the following associated plants: *Metrosideros polymorpha*, and *Styphelia tameiameiae*, and *Dodonaea viscosa*; and (2) elevations between 609 and 1,050 m (2,000 and 3,440 ft).

Family Asteraceae: *Wilkesia hobdyi* (Dwarf Iliau)

Kauai G and J, identified in the legal descriptions in paragraph (a)(1)(i)(A) of this section, constitute critical habitat for *Wilkesia hobdyi* on Kauai. Within these units, the currently known

primary constituent elements of critical habitat are habitat components that provide: (1) Coastal dry cliffs or very dry ridges containing one or more of the following associated native plant species: *Artemisia* sp., *Wilkesia gymnoxiphium*, *Lipochaeta connata*, *Lobelia niihauensis*, *Peucedanum sandwicense*, *Hibiscus kokio* ssp. *saintjohnianus*, *Canthium odoratum*, *Peperomia* sp., *Myoporum sandwicense*, *Sida fallax*, *Waltheria indica*, *Dodonaea viscosa*, or *Eragrostis variabilis*; and (2) elevations between 275 to 400 m (900 to 1,310 ft).

Family Campanulaceae: *Brighamia insignis* ('Olulu)

Kauai E, G, and M, identified in the legal descriptions in paragraph a)(1)(i)(A) of this section, and Niihau B, identified in the legal descriptions in paragraph a)(1)(i)(B) of this section, constitute critical habitat for *Brighamia insignis* on Kauai and Niihau. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Rocky ledges with little soil or steep sea cliffs (a) in lowland dry grasslands or shrublands with annual rainfall that is usually less than 170 cm (65 in.) and (b) containing one or more of the following native plant species: *Artemisia* sp., *Chamaesyce celastroides*, *Canthium odoratum*, *Eragrostis variabilis*, *Heteropogon contortus*, *Hibiscus kokio*, *Hibiscus saintjohnianus*, *Lepidium serra*, *Lipochaeta succulenta*, *Munroidendron racemosum*, or *Sida fallax*; and (2) elevations between sea level to 480 m (1,575 ft) elevation.

Family Campanulaceae: *Clermontia lindseyana* ('Oha Wai)

Maui units Qq and Yy, identified in the legal descriptions in paragraph a)(1)(i)(C) of this section, constitute critical habitat for *Clermontia lindseyana* on Maui. Within these units the currently known primary constituent elements of critical habitat for *Clermontia lindseyana* on Maui are the habitat components that provide: (1) Remnant *Acacia koa* mesic forest containing one or more of the following associated native plant species: *Cyrtandra oxybapha*, native fern species, *Phlegmariurus mannii*, *Ilex anomala*, *Coprosma* sp., or *Myrsine* sp.; and (2) elevations between 4,300 and 7,041 ft (1,311 and 2,150 m).

Family Campanulaceae: *Clermontia oblongifolia* ssp. *mauiensis* ('Oha Wai)

Maui unit P, identified in the legal description in paragraph a)(1)(i)(C) of this section, constitutes critical habitat

for *Clermontia oblongifolia* ssp. *mauiensis* on Maui. Within this unit the currently known primary constituent elements of critical habitat for *Clermontia oblongifolia* ssp. *mauiensis* on Maui are the habitat components that provide: (1) The sides of ridges (a) in *Metrosideros polymorpha*-dominated montane wet forest and (b) containing one or more of the following associated native plant species: *Dicranopteris linearis*, *Coprosma* sp., *Clermontia* sp., *Hedyotis* sp., or *Melicope* sp.; and (2) elevations between 850 and 1,000 m (2,800 and 3,280 ft).

Family Campanulaceae: *Clermontia samuelii* ('Oha Wai)

Maui units Hh and Ii, identified in the legal descriptions in paragraph a)(1)(i)(C) of this section, constitute critical habitat for *Clermontia samuelii* on Maui. Within these units the currently known primary constituent elements of critical habitat for *Clermontia samuelii* ssp. *hanaensis* on Maui are the habitat components that provide: (1) Wet *Metrosideros polymorpha* and *Metrosideros polymorpha*-*Dicranopteris linearis* forest containing one or more of the following associated native plant species: *Tetraplasandra oahuensis*, *Hedyotis terminalis*, *Hedyotis hillebrandii*, *Broussaisia arguta*, *Cibotium* sp., *Argyroxiphium grayanum*, *Dubautia* sp., *Clermontia arborea*, *Psychotria mariniana*, *Melicope clusifolia*, *Diplazium sandwichianum*, *Peperomia obovatilimba*, *Adenophorus tamariscinus*, *Vaccinium* sp., *Carex alligata*, *Melicope* sp., or *Cheirodendron trigynum*; and (2) elevations between 915 and 1,059 m (3,000 and 3,600 ft). Within these units, the currently known primary constituent elements of critical habitat for *Clermontia samuelii* ssp. *samuelii* on Maui are the habitat components that provide: (1) Wet *Metrosideros polymorpha* and *Metrosideros polymorpha*-*Cheirodendron trigynum* forest and containing one or more of the following native plant species: *Hedyotis hillebrandii*, *Cibotium* sp., *Broussaisia arguta*, *Diplazium sandwichianum*, *Rubus hawaiiensis*, *Clermontia arborescens* ssp. *waihae*, *Dubautia* sp., *Clermontia* sp., *Hedyotis* sp., *Vaccinium* sp., *Carex alligata*, or *Melicope* sp.; and (2) elevations between 1,726 to 2,100 m (5,870 to 6,900 ft).

Family Campanulaceae: *Cyanea asarifolia* (Haha)

Kauai R and T, identified in the legal descriptions in paragraph a)(1)(i)(A) of this section, constitute critical habitat for *Cyanea asarifolia* on Kauai. Within

these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Pockets of soil on sheer rock cliffs (a) in lowland wet forests and (b) containing one or more of the following native plant species: *Hedyotis elatior*, *Machaerina angustifolia*, *Metrosideros polymorpha*, *Touchardia latifolia*, or *Urera glabra*; and (2) elevations between 330 to 730 m (1,080 to 2,400 ft).

Family Campanulaceae: *Cyanea copelandii* ssp. *haleakalaensis* (Haha)

Maui units Bb and Gg, identified in the legal descriptions in paragraph a)(1)(i)(C) of this section, constitute critical habitat for *Cyanea copelandii* ssp. *haleakalaensis* on Maui. Within these units the currently known primary constituent elements of critical habitat for *Cyanea copelandii* ssp. *haleakalaensis* on Maui are the habitat components that provide: (1) Stream banks and wet scree slopes (a) in montane wet or mesic forest dominated by *Acacia koa* and/or *Metrosideros polymorpha* and (b) containing one or more of the following associated native plant species: *Cibotium* sp., *Perrottetia sandwicense*, *Psychotria hawaiiensis*, *Broussaisia arguta*, or *Hedyotis acuminata*; and (2) elevations between 730 and 1,340 m (2,400 and 4,400 ft).

Family Campanulaceae: *Cyanea glabra* (Haha)

Maui unit Q, identified in the legal description in paragraph a)(1)(i)(C) of this section, constitutes critical habitat for *Cyanea glabra* on Maui. Within this unit the currently known primary constituent elements of critical habitat for *Cyanea glabra* on Maui are the habitat components that provide: (1) Soil and rock stream banks (a) in wet lowland forest and dominated by *Acacia koa* and/or *Metrosideros polymorpha*; and (2) elevations from 800 to 1,340 m (2,625 to 4,400 ft).

Family Campanulaceae: *Cyanea grimesiana* ssp. *grimesiana* (Haha)

Maui unit Q, identified in the legal description in paragraph a)(1)(i)(C) of this section, constitutes critical habitat for *Cyanea grimesiana* ssp. *grimesiana* on Maui. Within this unit the currently known primary constituent elements of critical habitat for *Cyanea grimesiana* ssp. *grimesiana* on Maui are the habitat components that provide: (1) Rocky or steep slopes of stream banks (a) in mesic forest often dominated by *Metrosideros polymorpha* or *Metrosideros polymorpha* and *Acacia koa* and (b) containing one or more of the following associated native plant species: *Antidesma* sp., *Bohea* sp., *Myrsine* sp.,

Nestegis sandwicensis, *Psychotria* sp., or *Xylosma* sp.; and (2) elevations between 350 and 945 m (1,150 and 3,100 ft).

Family Campanulaceae: *Cyanea hamatiflora* ssp. *hamatiflora* (Haha)

Maui units Cc, Dd, Ff, and Kk, identified in the legal descriptions in paragraph (a)(1)(i)(C) of this section, constitute critical habitat for *Cyanea hamatiflora* ssp. *hamatiflora* on Maui. Within these units the currently known primary constituent elements of critical habitat for *Cyanea hamatiflora* ssp. *hamatiflora* on Maui are the habitat components that provide: (1) Montane wet forest dominated by *Metrosideros polymorpha*, with a *Cibotium* sp. and/or native shrub understory or closed *Acacia koa*-*Metrosideros polymorpha* wet forest containing one or more of the following associated native plant species: *Dicranopteris linearis*, *Cheirodendron trigynum*, *Broussaisia arguta*, *Cyanea solenocalyx*, *Cyanea kunthiana*, *Vaccinium* sp., *Melicope* sp., or *Myrsine* sp.; and (2) elevations from 975 to 1,500 m (3,200 to 4,920 ft).

Family Campanulaceae: *Cyanea lobata* (Haha)

Maui unit Q, identified in the legal description in paragraph (a)(1)(i)(C) of this section, constitutes critical habitat for *Cyanea lobata* on Maui. Within this unit the currently known primary constituent elements of critical habitat for *Cyanea lobata* on Maui are the habitat components that provide: (1) Steep stream banks in deep shade (a) in wet forest and (b) containing one or more of the following associated native plant species: *Touchardia latifolia*, *Morinda trimera*, or *Athyrium* sp.; and (2) elevations of 550 to 915 m (1,800 to 3,000 ft).

Family Campanulaceae: *Cyanea mceldowneyi* (Haha)

Maui units Bb, Dd, Gg, and Hh, identified in the legal descriptions in paragraph (a)(1)(i)(C) of this section, constitute critical habitat for *Cyanea mceldowneyi* on Maui. Within these units the currently known primary constituent elements of critical habitat for *Cyanea mceldowneyi* on Maui are the habitat components that provide: (1) Montane wet forest with mixed *Metrosideros polymorpha*-*Acacia koa* containing one or more of the following associated native plant species: *Melicope clusiifolia*, *Hedyotis* sp., *Clermontia arborescens*, *Diplazium sandwichianum*, *Broussaisia arguta*, *Cibotium* sp., *Cyrtandra* sp., *Dicranopteris linearis*, or *Cheirodendron*

trigynum; and (2) elevations between 925 and 1,280 m (3,034 and 4,200 ft).

Family Campanulaceae: *Cyanea recta* (Haha)

Kauai K, O, P, and R, identified in the legal descriptions in paragraph (a)(1)(i)(A) of this section, constitute critical habitat for *Cyanea recta* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Gulches or slopes (a) in lowland wet or mesic *Metrosideros polymorpha* forest or shrubland and (b) containing one or more of the following native plant species: *Dicranopteris linearis*, *Psychotria* sp., *Antidesma* sp., *Cheirodendron platyphyllum*, *Cibotium* sp., or *Diplazium* sp.; and (2) elevations between 400 to 1,200 m (1,310 to 3,940 ft).

Family Campanulaceae: *Cyanea remyi* (Haha)

Kauai L, P, R, and T, identified in the legal descriptions in paragraph (a)(1)(i)(A) of this section, constitute critical habitat for *Cyanea remyi* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Lowland wet forest or shrubland and containing one or more of the following native plant species: *Antidesma* sp., *Cheirodendron* sp., *Diospyros* sp., *Broussaisia arguta*, *Metrosideros polymorpha*, *Freycinetia arborea*, *Hedyotis terminalis*, *Machaerina angustifolia*, *Perrottetia sandwicensis*, *Psychotria hexandra*, or *Syzygium sandwicensis*; and (2) elevations between 360 to 930 m (1,180 to 3,060 ft).

Family Campanulaceae: *Cyanea undulata* (Haha)

Kauai L, identified in the legal descriptions in paragraph (a)(1)(i)(A) of this section, constitutes critical habitat for *Cyanea undulata* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Pristine, undisturbed sites along shady stream banks or steep to vertical slopes; and (2) elevations between 630 to 800 m (2,070 to 2,625 ft).

Family Campanulaceae: *Delissea rhytidosperra* (No Common Name)

Kauai F, G, and M, identified in the legal descriptions in paragraph (a)(1)(i)(A) of this section, constitute critical habitat for *Delissea rhytidosperra* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1)

Well-drained soils with medium or fine-textured subsoil (a) in diverse lowland mesic forests or *Acacia koa* dominated lowland dry forests and (b) containing one or more of the following native species: *Euphorbia haeleleana*, *Psychotria hobdyi*, *Pisonia* sp., *Pteralyxia* sp., *Dodonaea viscosa*, *Cyanea* sp., *Hedyotis* sp., *Dianella sandwicensis*, *Diospyros sandwicensis*, *Styphelia tameiameia*, or *Nestegis sandwicensis*; and (2) elevations between 120 and 915 m (400 and 3,000 ft).

Family Campanulaceae: *Delissea rivularis* ('Oha)

Kauai G, identified in the legal description in paragraph (a)(1)(i)(A) of this section, constitutes critical habitat for *Delissea rivularis* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Steep slopes near streams (a) in *Metrosideros polymorpha*—*Cheirodendron trigynum* montane wet or mesic forest and (b) containing one or more of the following native plant species: *Broussaisia arguta*, *Carex* sp., *Coprosma* sp., *Melicope clusiifolia*, *M. anisata*, *Psychotria hexandra*, *Dubautia knudsenii*, *Diplazium sandwichianum*, *Hedyotis foggiana*, *Ilex anomala*, or *Sadleria* sp.; and (2) elevations between 1,100 to 1,220 m (3,610 to 4,000 ft).

Family Campanulaceae: *Delissea undulata* (No Common Name)

Kauai G, identified in the legal description in paragraph (a)(1)(i)(A) of this section, constitutes critical habitat for *Delissea undulata* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Dry or mesic open *Sophora chrysophylla*-*Metrosideros polymorpha* forests containing one or more of the following native plant species: *Diospyros sandwicensis*, *Dodonaea viscosa*, *Psychotria mariniana*, *P. greenwelliae*, *Santalum ellipticum*, *Nothoecstrum breviflorum*, or *Acacia koa*; and (2) elevations between 610–1,740 m (2,000–5,700 ft).

Family Campanulaceae: *Lobelia niihauensis* (No Common Name)

Kauai F, G, I, and J, identified in the legal descriptions in paragraph (a)(1)(i)(A) of this section, constitute critical habitat for *Lobelia niihauensis* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Exposed mesic mixed shrubland or coastal dry cliffs containing one or more of the

following associated native plant species: *Eragrostis* sp., *Bidens* sp., *Plectranthus parviflorus*, *Lipochaeta* sp., *Lythrum* sp., *Wilkesia hobbnyi*, *Hibiscus kokio* ssp. *saint johnianus*, *Nototrichium* sp., *Schiedea apokremnos*, *Chamaesyce celastroides*, *Charpentiera* sp., or *Artemisia* sp.; and (2) elevations between 100 to 830 m (330 to 2720 ft).

Family Caryophyllaceae: *Alsinidendron lychnoides* (Kuawawaenuhu)

Kauai G and H, identified in the legal descriptions in paragraph (a)(1)(i)(A) of this section, constitute critical habitat for *Alsinidendron lychnoides* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Montane wet forests (a) dominated by *Metrosideros polymorpha* and *Cheirodendron* sp., or by *Metrosideros polymorpha* and *Dicranopteris linearis* and (b) containing one or more of the following native plant species: *Carex* sp., *Cyrtandra* sp., *Machaerina* sp., *Vaccinium* sp., *Peperomia* sp., *Hedyotis terminalis*, *Astelia* sp., or *Broussaisia arguta*; and (2) elevations between 1,100 and 1,320 m (3,610 and 4,330 ft).

Family Caryophyllaceae: *Alsinidendron viscosum* (No Common Name)

Kauai I, identified in the legal description in paragraph (a)(1)(i)(A) of this section, constitutes critical habitat for *Alsinidendron viscosum* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Steep slopes (a) in *Acacia koa*-*Metrosideros polymorpha* lowland, montane mesic, or wet forest and (b) containing one or more of the following native plant species: *Alyxia olivaeformis*, *Bidens cosmoides*, *Bobea* sp., *Carex* sp., *Coprosma* sp., *Dodonaea viscosa*, *Gahnia* sp., *Ilex anomala*, *Melicope* sp., *Pleomele* sp., *Psychotria* sp., or *Schiedea stellarioides*; and (2) elevations between 820 and 1,200 m (2,700 and 3,940 ft).

Family Caryophyllaceae: *Schiedea apokremnos* (Ma'oli'oli)

Kauai G and J, identified in the legal descriptions in paragraph (a)(1)(i)(A) of this section, constitute critical habitat for *Schiedea apokremnos* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Crevices of near-vertical coastal cliff faces (a) in sparse dry coastal shrub vegetation and (b) containing one or more of the following associated native plant species:

Heliotropium sp., *Chamaesyce* sp., *Bidens* sp., *Artemisia australis*, *Lobelia niihauensis*, *Wilkesia hobbnyi*, *Lipochaeta connata*, *Myoporum sandwicense*, *Canthium odoratum*, or *Peperomia* sp.; and (2) elevations between 60 to 330 m (200 to 1,080 ft).

Family Caryophyllaceae: *Schiedea helleri* (No Common Name)

Kauai I, identified in the legal description in paragraph (a)(1)(i)(A) of this section, constitutes critical habitat for *Schiedea helleri* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Ridges and steep cliffs (a) in closed *Metrosideros polymorpha*-*Dicranopteris linearis* montane wet forest, or *Metrosideros polymorpha*-*Cheirodendron* sp. montane wet forest, or *Acacia koa*-*Metrosideros polymorpha* montane mesic forest, and (b) containing one or more of the following associated native plant species: *Dubautia raillardiioides*, *Scaevola procera*, *Hedyotis terminalis*, *Syzygium sandwicense*, *Melicope clusifolia*, *Cibotium* sp., *Broussaisia arguta*, *Cheirodendron* sp., *Cyanea hirtella*, *Dianella sandwicensis*, *Viola wailenalanae*, or *Poa sandwicensis*; and (2) elevations between 1,065–1,100 m (3,490–3,610 ft).

Family Caryophyllaceae: *Schiedea kauaiensis* (No Common Name)

Kauai G, identified in the legal description in paragraph (a)(1)(i)(A) of this section, constitutes critical habitat for *Schiedea kauaiensis* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Steep slopes (a) in diverse mesic or wet forest and (b) containing one or more of the following associated plant taxa: *Psychotria mariniana*, *Psychotria hexandra*, *Canthium odoratum*, *Pisonia* sp., *Microlepia speluncae*, *Exocarpos luteolus*, *Diospyros* sp., *Peucedanum sandwicense*, or *Euphorbia haeleeleana*; and (2) elevations between 680–790 m (2,230–2,590 ft).

Family Caryophyllaceae: *Schiedea membranacea* (No Common Name)

Kauai G, I, and K, identified in the legal descriptions in paragraph (a)(1)(i)(A) of this section, constitute critical habitat for *Schiedea membranacea* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Cliffs or cliff bases (a) in mesic or wet habitats, (b) in lowland, or montane

shrubland, or forest communities dominated by *Acacia koa*, *Pipturus* sp. or *Metrosideros polymorpha* and (c) containing one or more of the following associated native plant species: *Hedyotis terminalis*, *Melicope* sp., *Pouteria sandwicensis*, *Poa mannii*, *Hibiscus waimeae*, *Psychotria mariniana*, *Canthium odoratum*, *Pisonia* sp., *Perrottetia sandwicensis*, *Scaevola procera*, *Sadleria cyatheoides*, *Diplazium sandwicense*, *Thelypteris sandwicensis*, *Boehmeria grandis*, *Dodonaea viscosa*, *Myrsine* sp., *Bobea brevipes*, *Alyxia olivaeformis*, *Psychotria greenwelliae*, *Pleomele* sp., *Alphitonia ponderosa*, *Joinvillea ascendens* ssp. *ascendens*, *Athyrium sandwichianum*, *Machaerina angustifolia*, *Cyrtandra paludosa*, *Touchardia latifolia*, *Thelypteris cyatheoides*, *Lepidium serra*, *Eragrostis variabilis*, *Remya kauaiensis*, *Lysimachia kalalauensis*, *Labordia helleri*, *Mariscus pennatifolius*, *Asplenium praemorsum*, or *Poa sandwicensis*; and (2) elevations between 520 and 1,160 m (1,700 and 3,800 ft).

Family Caryophyllaceae: *Schiedea nuttallii* (No Common Name)

Kauai M, identified in the legal description in paragraph (a)(1)(i)(A) of this section, constitutes critical habitat for *Schiedea nuttallii* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Diverse lowland mesic forest, often with *Metrosideros polymorpha* dominant, containing one or more of the following associated native plant species: *Antidesma* sp., *Psychotria* sp., *Perrottetia sandwicensis*, *Pisonia* sp., or *Hedyotis acuminata*; and (2) elevations between 415 and 790 m (1,360 and 2,590 ft).

Family Caryophyllaceae: *Schiedea spergulina* var. *leiopoda* (No Common Name)

Kauai C, identified in the legal description in paragraph (a)(1)(i)(A) of this section, constitutes critical habitat for *Schiedea spergulina* var. *leiopoda* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Bare rock outcrops or sparsely vegetated portions of rocky cliff faces or cliff bases (a) in diverse lowland mesic forests and (b) containing one or more of the following native plants: *Bidens sandwicensis*, *Doryopteris* sp., *Peperomia leptostachya*, or *Plectranthus parviflorus*; and (2) elevations between 180 and 800 m (590 and 2,625 ft).

Family Caryophyllaceae: *Schiedea spergulina* var. *spergulina* (No Common Name)

Kauai G and I, identified in the legal descriptions in paragraph (a)(1)(i)(A) of this section, constitute critical habitat for *Schiedea spergulina* var. *spergulina* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Bare rock outcrops or sparsely vegetated portions of rocky cliff faces or cliff bases (a) in diverse lowland mesic forests and (b) containing one or more of the following associated plant taxa: *Heliotropium* sp., or *Nototrichium sandwicense*; and (2) elevations between 180 and 800 m (590 and 2,625 ft).

Family Caryophyllaceae: *Schiedea stellarioides* (lauilihilihi (=ma'oli'oli))

Kauai I, identified in the legal description in paragraph (a)(1)(i)(A) of this section, constitutes critical habitat for *Schiedea stellarioides* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Steep slopes (a) in closed *Acacia koa*-*Metrosideros polymorpha* lowland or montane mesic forest or shrubland and (b) containing one or more of the following native plant species: *Nototrichium* sp., *Artemisia* sp., *Dodonaea viscosa*, *Melicope* sp., *Dianella sandwicensis*, *Bidens cosmoides*, *Mariscus* sp., or *Styphelia tameiameia*; and (2) elevations between 610 and 1,120 m (2,000 and 3,680 ft).

Family Convolvulaceae: *Bonamia menziesii* (No Common Name)

(i.) Kauai G and L, identified in the legal descriptions in paragraph (a)(1)(i)(A) of this section, constitute critical habitat for *Bonamia menziesii* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Dry, mesic or wet forests containing one or more of the following native plant species: *Metrosideros polymorpha*, *Canthium odoratum*, *Dianella sandwicensis*, *Diospyros sandwicensis*, *Dodonaea viscosa*, *Hedyotis terminalis*, *Melicope anisata*, *Melicope barbigera*, *Myoporum sandwicense*, *Nestegis sandwicense*, *Pisonia* sp., *Pittosporum* sp., *Pouteria sandwicensis*, or *Sapindus oahuensis*; and (2) elevations between 150 and 850 m (500 and 2,800 ft).

(ii.) Maui units O and Ss, identified in the legal descriptions in paragraph (a)(1)(i)(C) of this section, constitute critical habitat for *Bonamia menziesii*

on Maui. Within these units the currently known primary constituent elements of critical habitat for *Bonamia menziesii* on Maui are the habitat components that provide: (1) A'ava lava (a) in mixed open dry forest or *Erythrina sandwicensis* lowland dry forest, or in mesic mixed *Metrosideros polymorpha* forest and (b) containing one or more of the following associated native plant species: *Nestegis sandwicensis*, *Pleomele auwahiensis*, *Dodonaea viscosa*, *Osteomeles anthyllidifolia*, *Alphitonia ponderosa*, *Santalum ellipticum*, *Xylosma hawaiiensis*, *Nothocestrum latifolium*, *Pouteria sandwicensis*, *Achyranthes splendens*, *Acacia koaia*, *Sida fallax*, *Reynoldsia sandwicensis*, *Sicyos* sp., *Lipochaeta rockii*, *Nototrichium* sp., or *Myoporum sandwicense*; and (2) elevations between 150 and 854 m (490 and 2,800 ft).

Family Cyperaceae: *Cyperus trachysanthos* (pu'uka'a)

Kauai G, identified in the legal descriptions in paragraph (a)(1)(i)(A) of this section, and Niihau A, identified in the legal descriptions in paragraph (a)(1)(i)(B) of this section, constitute critical habitat for *Cyperus trachysanthos* on Kauai and Niihau. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Wet sites (mud flats, wet clay soil, or wet cliff seeps) (a) on coastal cliffs or talus slopes and (b) containing the native plant species *Hibiscus tiliaceus*; and (2) elevations between 3 and 160 m (10 and 525 ft).

Family Cyperaceae: *Mariscus pennatififormis* (No Common Name)

Maui unit J, identified in the legal description in paragraph (a)(1)(i)(C) of this section, constitutes critical habitat for *Mariscus pennatififormis* on Maui. Within this unit the currently known primary constituent elements of critical habitat for *Mariscus pennatififormis* on Maui are the habitat components that provide: (1) Cliffs with brown soil and talus within reach of ocean spray (a) in *Pandanus* coastal wet forests and (b) containing one or more of the following associated native plant species: *Sadleria pallida*, *Pandanus tectorius*, *Lysimachia mauritiana*, *Cyperus laevigatus*, *Eragrostis* sp., or *Ipomoea* sp.; and (2) elevations between sea-level and 6 m (20 ft).

Family Euphorbiaceae: *Chamaesyce halemanui* (No Common Name)

Kauai G and I, identified in the legal descriptions in paragraph (a)(1)(i)(A) of this section, constitute critical habitat for *Chamaesyce halemanui* on Kauai.

Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Steep slopes of gulches (a) in mesic *Acacia koa* forests and (b) containing one or more of the following native plant species: *Metrosideros polymorpha*, *Alphitonia ponderosa*, *Antidesma platyphyllum*, *Bobea brevipes*, *Cheirodendron trigynum*, *Coprosma* sp., *Diospyros sandwicensis*, *Dodonaea viscosa*, *Elaeocarpus bifidus*, *Hedyotis terminalis*, *Kokia kauaiensis*, *Melicope haupuensis*, *Pisonia* sp., *Pittosporum* sp., *Pleomele aurea*, *Psychotria mariniana*, *Psychotria greenwelliae*, *Pouteria sandwicensis*, *Santalum freycinetianum*, or *Styphelia tameiameia*; and (2) elevations between 660 to 1,100 m (2,165 to 3,610 ft).

Family Euphorbiaceae: *Euphorbia haeleleana* ('Akoko)

Kauai G, I, and U, identified in the legal descriptions in paragraph (a)(1)(i)(A) of this section, constitute critical habitat for *Euphorbia haeleleana* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Lowland mixed mesic or dry forest that (a) is often dominated by *Metrosideros polymorpha*, *Acacia koa*, or *Diospyros* sp. and (b) containing one or more of the following native plant species: *Acacia koaia*, *Antidesma platyphyllum*, *Claoxylon* sp., *Carex meyenii*, *Carex wahuensis*, *Diplazium sandwichianum*, *Dodonaea viscosa*, *Erythrina sandwicensis*, *Kokia kauaiensis*, *Pleomele aurea*, *Psychotria mariniana*, *P. greenwelliae*, *Pteralyxia sandwicensis*, *Rauvolfia sandwicensis*, *Reynoldsia sandwicensis*, *Sapindus oahuensis*, *Tetraplasandra kauaiensis*, *Pouteria sandwicensis*, *Pisonia sandwicensis*, or *Xylosma* sp.; and (2) elevations between 205 and 670 m (680 and 2,200 ft).

Family Euphorbiaceae: *Flueggea neowawraea* (Mehamehame)

(i.) Kauai F, G, and I, identified in the legal descriptions in paragraph (a)(1)(i)(A) of this section, constitute critical habitat for *Flueggea neowawraea* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Dry or mesic forests containing one or more of the following native plant species: *Alectryon macrococcus*, *Bobea timonioides*, *Charpentiera* sp., *Caesalpinia kauaiense*, *Hibiscus* sp., *Melicope* sp., *Metrosideros polymorpha*, *Myrsine lanaiensis*, *Munroidendron*

racemosum, *Tetraplasandra* sp., *Kokia kauaiensis*, *Isodendron* sp., *Pteralyxia kauaiensis*, *Psychotria mariniana*, *Diplazium sandwichianum*, *Freycinetia arborea*, *Nesoluma polynesianum*, *Diospyros* sp., *Antidesma pulvinatum*, *A. platyphyllum*, *Canthium odoratum*, *Nestegis sandwichensis*, *Rauvolfia sandwichensis*, *Pittosporum* sp., *Tetraplasandra* sp., *Pouteria sandwichensis*, *Xylosma* sp., *Pritchardia* sp., *Bidens* sp., or *Streblus pendulinus*; and (2) elevations of 250 to 1,000 m (820 to 3,280 ft).

(ii.) Maui units Ss and Ww, identified in the legal descriptions in paragraph (a)(1)(i)(C) of this section, constitute critical habitat for *Flueggea neowawraea* on Maui. Within these units the currently known primary constituent elements of critical habitat for *Flueggea neowawraea* on Maui are the habitat components that provide: (1) Dry or mesic forest containing one or more of the following associated native plant species: *Alectryon macrococcus*, *Bohea timonioides*, *Charpentiera* sp., *Hibiscus* sp., *Melicope* sp., *Myrsine lanaiensis*, *Tetraplasandra* sp., *Psychotria mariniana*, *Diplazium sandwichianum*, *Freycinetia arborea*, *Nesoluma polynesianum*, *Diospyros* sp., *Antidesma pulvinatum*, *A. platyphyllum*, *Canthium odoratum*, *Nestegis sandwichensis*, *Rauvolfia sandwichensis*, *Pittosporum* sp., *Pleomele* sp., *Pouteria sandwichensis*, or *Streblus pendulina*; and (2) elevations of 250 to 1,000 m (820 to 3,280 ft).

Family Fabaceae: *Kanaloa kahoolawensis* (Kohe Malama Malama O Kanaloa)

Kahoolawe unit B, identified in the legal description in paragraph (a)(1)(i)(D) of this section, constitutes critical habitat for *Kanaloa kahoolawensis* on Kahoolawe. Within this unit the currently known primary constituent elements of critical habitat for *Kanaloa kahoolawensis* on Kahoolawe are the habitat components that provide: (1) Steep rocky talus slopes (a) in mixed coastal shrubland and (b) containing one or more of the following associated native plants: *Sida fallax*, *Senna gaudichaudii*, *Bidens mauiensis*, *Lipochaeta livarum*, *Portulaca molokinensis*, or *Capparis sandwichiana*; and (2) elevations between 45 to 60 m (150 to 200 ft).

Family Fabaceae: *Sesbania tomentosa* ('Ohai)

(i.) Kauai J, identified in the legal description in paragraph (a)(1)(i)(A) of this section, constitutes critical habitat for *Sesbania tomentosa* on Kauai.

Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Sandy beaches, dunes, soil pockets on lava, or pond margins (a) in coastal dry shrublands, or open *Metrosideros polymorpha* forests, or mixed coastal dry cliffs, and (b) containing one or more of the following associated native plant species: *Sida fallax*, *Heteropogon contortus*, *Myoporum sandwicense*, *Sporobolus virginicus*, *Scaevola sericea*, or *Dodonaea viscosa*; and (2) elevations between sea level and 12 m (0 and 40 ft).

(ii.) Maui units A, B, C, D, X, Tt, identified in the legal descriptions in paragraph (a)(1)(i)(C) of this section, and the Kahoolawe unit A, identified in the legal descriptions in paragraph (a)(1)(i)(D) of this section, constitute critical habitat for *Sesbania tomentosa* on Maui and Kahoolawe, respectively. Within these units the currently known primary constituent elements of critical habitat for *Sesbania tomentosa* on Maui and Kahoolawe are the habitat components that provide: (1) Windswept slopes, sea cliffs and cinder slopes (a) in *Scaevola sericea* coastal dry shrublands and (b) containing one or more of the following associated native plant species: *Lipochaeta integrifolia*, *Jacquemontia ovalifolia* ssp. *sandwicense*, *Rhynchelytrum repens*, *Sida fallax*, and *Dodonaea viscosa*; and (2) elevations between sea-level and 580 m (1,900 ft).

Family Fabaceae: *Vigna o-wahuensis* (No Common Name)

Maui unit Vv, identified in the legal descriptions in paragraph (a)(1)(i)(C) of this section, and Kahoolawe units C and D, identified in the legal descriptions in paragraph (a)(1)(i)(D) of this section, constitute critical habitat for *Vigna o-wahuensis* on Maui and Kahoolawe, respectively. Within these units the currently known primary constituent elements of critical habitat for *Vigna o-wahuensis* on Maui and Kahoolawe are the habitat components that provide: (1) Dry or mesic grassland or shrubland containing one or more of the following associated plant taxa: *Sida fallax*, *Chenopodium* sp., *Dubautia menziesii*, *Dodonaea viscosa*, *Chamaesyce* sp., *Nothoecstrum latifolium*, and *Nesoluma polynesianum*, or *Osteomeles anthyllidifolia*; and (2) elevations from 10 to 140 m (30 to 460 ft).

Family Flacourtiaceae: *Xylosma crenatum* (No Common Name)

Kauai G and I, identified in the legal descriptions in paragraph (a)(1)(i)(A) of this section, constitute critical habitat

for *Xylosma crenatum* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Diverse *Acacia koa-Metrosideros polymorpha* montane mesic forest, or *Metrosideros polymorpha-Dicranopteris linearis* montane wet forest, or *Acacia koa-Metrosideros polymorpha* montane wet forest, and containing one or more of the following associated native plant species: *Tetraplasandra kauaiensis*, *Hedyotis terminalis*, *Pleomele aurea*, *Ilex anomala*, *Cloaxylon sandwicense*, *Myrsine alyxifolia*, *Nestegis sandwichensis*, *Streblus pendulinus*, *Psychotria* sp., *Diplazium sandwichianum*, *Pouteria sandwichensis*, *Scaevola procera*, *Coprosma* sp., *Athyrium sandwichianum*, *Touchardia latifolia*, *Dubautia knudsenii*, *Cheirodendron* sp., *Lobelia yuccoides*, *Cyanea hirta*, *Poa sandwicense*, or *Diplazium sandwichianum*; and (2) elevations between 975 to 1,065 m (3,200 to 3,490 ft).

Family Gentianaceae: *Centaurium sebaeoides* ('Awiwi)

(i.) Kauai G, identified in the legal description in paragraph (a)(1)(i)(A) of this section, constitutes critical habitat for *Centaurium sebaeoides* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Volcanic or clay soils or cliffs (a) in arid coastal areas and (b) containing one or more of the following native plant species: *Artemisia* sp., *Bidens* sp., *Chamaesyce celastroides*, *Dodonaea viscosa*, *Fimbristylis cymosa*, *Heteropogon contortus*, *Jaquemontia ovalifolia*, *Lipochaeta succulenta*, *Lipochaeta heterophylla*, *Lipochaeta integrifolia*, *Lycium sandwicense*, *Lysimachia mauritiana*, *Mariscus phloides*, *Panicum fauriei*, *P. torridum*, *Scaevola sericea*, *Schiedea globosa*, *Sida fallax*, or *Wikstroemia uva-ursi*; and (2) elevations above 250 m (800 ft).

(ii.) Maui units D, E, and F, identified in the legal descriptions in paragraph (a)(1)(i)(C) of this section, constitute critical habitat for *Centaurium sebaeoides* on Maui. Within these units the currently known primary constituent elements of critical habitat for *Centaurium sebaeoides* on Maui are the habitat components that provide: (1) Volcanic or clay soils or cliffs (a) in arid coastal areas and (b) containing one or more of the following associated native plant species: *Panicum torridum*, *Lysimachia mauritiana*, *Schiedea globosa*, *Lipochaeta integrifolia*, *Argemone glauca*, *Bidens mauiensis*, *Lycium sandwicense*, or *Dicranopteris*

linearis; and (2) elevations below 250 m (820 ft).

Family Geraniaceae: *Geranium arboreum* (Nohoanu)

Maui units Ll, Mm, Nn, and Pp, identified in the legal descriptions in paragraph (a)(1)(i)(C) of this section, constitute critical habitat for *Geranium arboreum* on Maui. Within these units the currently known primary constituent elements of critical habitat for *Geranium arboreum* on Maui are the habitat components that provide: (1) Steep, damp and shaded narrow canyons and gulches, steep banks, and intermittent streams (a) in *Sophora chrysophylla* subalpine dry shrubland or *Metrosideros polymorpha* montane forest and (b) containing one or more of the following associated native plant species: *Vaccinium reticulatum*, *Dodonaea viscosa*, *Styphelia tameiameia*, *Rubus hawaiiensis*, or *Dryopteris wallichiana*; and (2) elevations between 1,525 to 2,135 m (5,000 and 7,000 ft).

Family Geraniaceae: *Geranium multiflorum* (Nohoanu)

Maui unit Ee, identified in the legal description in paragraph (a)(1)(i)(C) of this section, constitutes critical habitat for *Geranium multiflorum* on Maui. Within this unit the currently known primary constituent elements of critical habitat for *Geranium multiflorum* on Maui are the habitat components that provide: (1) Wet or mesic *Metrosideros polymorpha* montane forest or alpine mesic forest, *Styphelia tameiameia* shrubland, *Sophora chrysophylla* subalpine dry forest, open sedge swamps, fog-swept lava flows, or montane grasslands containing one or more of the following associated native plant species: *Coprosma montana*, *Dryopteris glabra*, *Dryopteris wallichiana*, *Rubus hawaiiensis*, *Ranunculus* sp., *Vaccinium* sp., *Metrosideros polymorpha*, *Hedyotis* sp., *Styphelia tameiameia* or *Sadleria cyatheoides*; and (2) elevations between 1,580 and 2,450 m (5,180 and 8,040 ft).

Family Gesneriaceae: *Cyrtandra cyaneoides* (Mapele)

Kauai K, P, and R, identified in the legal descriptions in paragraph (a)(1)(i)(A) of this section, constitute critical habitat for *Cyrtandra cyaneoides* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Steep slopes or cliffs near streams or waterfalls (a) in lowland or montane wet forest or shrubland dominated by *Metrosideros polymorpha* or a mixture

of *Metrosideros polymorpha* and *Dicranopteris linearis* and (b) containing one or more of the following native species: *Perrottetia sandwicensis*, *Pipturus* sp., *Bidens* sp., *Psychotria* sp., *Pritchardia* sp., *Freycinetia arborea*, *Cyanea* sp., *Cyrtandra limahuliensis*, *Diplazium sandwichianum*, *Gunnera* sp., *Coprosma* sp., *Stenogyne* sp., *Machaerina* sp., *Boehmeria grandis*, *Pipturus* sp., *Cheirodendron* sp., *Hedyotis terminalis*, or *Hedyotis tryblium*; and (2) elevations between 550 and 1,220 meter (1,800 and 4,000 ft).

Family Gesneriaceae: *Cyrtandra limahuliensis* (Ha'iwale)

Kauai A, F, K, L, O, P, Q, R, and T, identified in the legal descriptions in paragraph (a)(1)(i)(A) of this section, constitute critical habitat for *Cyrtandra limahuliensis* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Stream banks (a) in lowland wet forests and (b) containing one or more of the following native plant species: *Antidesma* sp., *Cyrtandra kealiea*, *Pisonia* sp., *Pipturus* sp., *Cibotium glaucum*, *Eugenia* sp., *Hedyotis terminalis*, *Dubautia* sp., *Boehmeria grandis*, *Touchardia latifolia*, *Bidens* sp., *Hibiscus waimeae*, *Charpentiera* sp., *Urera glabra*, *Pritchardia* sp., *Cyanea* sp., *Perrottetia sandwicensis*, *Metrosideros polymorpha*, *Dicranopteris linearis*, *Gunnera kauaiensis*, or *Psychotria* sp.; and (2) elevations between 245 and 915 m (800 and 3,000 ft).

Family Gesneriaceae: *Cyrtandra munroi* (Hiawale)

Maui unit Y, identified in the legal description in paragraph (a)(1)(i)(C) of this section, constitutes critical habitat for *Cyrtandra munroi* on Maui. Within this unit the currently known primary constituent elements of critical habitat for *Cyrtandra munroi* on Maui are the habitat components that provide: (1) Rich, moist to wet, moderately steep talus slopes (a) in lowland wet *Metrosideros polymorpha*-*Dicranopteris linearis* forest and (b) containing one or more of the following associated native plant species: *Diospyros* sp., *Hedyotis acuminata*, *Clermontia* sp., *Alyxia oliviformis*, *Bobea* sp., *Coprosma* sp., *Freycinetia arborea*, *Melicope* sp., *Myrsine* sp., *Perrottetia sandwicensis*, *Pipturus* sp., *Pittosporum* sp., *Pleomele* sp., *Pouteria sandwicensis*, *Psychotria* sp., *Sadleria* sp., *Scaevola* sp., *Xylosma* sp., or other *Cyrtandra* sp.; and (2) elevations from 300 to 920 m (980 to 3,020 ft).

Family Lamiaceae: *Phyllostegia knudsenii* (No Common Name)

Kauai I, identified in the legal description in paragraph (a)(1)(i)(A) of this section, constitutes critical habitat for *Phyllostegia knudsenii* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) *Metrosideros polymorpha* lowland mesic or wet forest containing one or more of the following associated native plant species: *Perrottetia sandwicensis*, *Cyrtandra kauaiensis*, *Cyrtandra paludosa*, *Elaeocarpus bifidus*, *Claoxylon sandwicensis*, *Cryptocarya mannii*, *Ilex anomala*, *Myrsine linearifolia*, *Bobea timonioides*, *Selaginella arbuscula*, *Diospyros* sp., *Zanthoxylum dipetalum*, *Pittosporum* sp., *Tetraplasandra* spp., *Pouteria sandwicensis*, or *Pritchardia minor*; and (2) elevations between 865–975 m (2,840–3,200 ft).

Family Lamiaceae: *Phyllostegia mollis* (No Common Name)

Maui unit Qq, identified in the legal description in paragraph (a)(1)(i)(C) of this section, constitutes critical habitat for *Phyllostegia mollis* on Maui. Within this unit the currently known primary constituent elements of critical habitat for *Phyllostegia mollis* on Maui are the habitat components that provide: (1) Steep slopes and gulches (a) in diverse mesic or wet forests and (b) containing one or more of the following associated native plant taxa: ferns, *Psychotria* sp., or *Pisonia* sp.; and (2) elevations between 450 and 1,830 m (1,480 to 6,000 ft).

Family Lamiaceae: *Phyllostegia wawrana* (No Common Name)

Kauai G, I, and R, identified in the legal descriptions in paragraph (a)(1)(i)(A) of this section, constitute critical habitat for *Phyllostegia wawrana* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) *Metrosideros polymorpha* dominated lowland or montane wet or mesic forest with (a) *Cheirodendron* sp. or *Dicranopteris linearis* as co-dominants, and (b) containing one or more of the following associated native plant species: *Delissea rivularis*, *Diplazium sandwichianum*, *Vaccinium* sp., *Broussaisia arguta*, *Myrsine lanaiensis*, *Psychotria* sp., *Dubautia knudsenii*, *Scaevola procera*, *Gunnera* sp., *Pleomele aurea*, *Claoxylon sandwicense*, *Elaphoglossum* sp., *Hedyotis* sp., *Sadleria* sp., and *Syzygium sandwicensis*; and (2)

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

Family Lamiaceae: *Stenogyne campanulata* (No Common Name)

Kauai G, identified in the legal description in paragraph (a)(1)(i)(A) of this section, constitutes critical habitat for *Stenogyne campanulata* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Rock faces of nearly vertical, north-facing cliffs (a) in diverse lowland or montane mesic forest and (b) containing one or more of the following associated native plant species: *Heliotropium* sp., *Lepidium serra*, *Lysimachia glutinosa*, *Perrottetia sandwicensis*, or *Remya montgomeryi*; and (2) an elevation of 1,085 m (3,560 ft).

Family Loganiaceae: *Labordia lydgatei* (Kamakahala)

Kauai F, K, L, P, R, and T, identified in the legal descriptions in paragraph (a)(1)(i)(A) of this section, constitute critical habitat for *Labordia lydgatei* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) *Metrosideros polymorpha-Dicranopteris linearis* lowland wet forest containing one or more of the following associated native plant species: *Psychotria* sp., *Hedyotis terminalis* sp., *Cyanea* sp., *Cyrtandra* sp., *Labordia hirtella*, *Antidesma platyphyllum* var. *hillebrandii*, *Syzygium sandwicensis*, *Ilex anomala*, or *Dubautia knudsenii*; and (2) elevations between 635 and 855 m (2,080 to 2,800 ft).

Family Loganiaceae: *Labordia tinifolia* var. *wahiawaensis* (Kamakahala)

Kauai L, identified in the legal description in paragraph (a)(1)(i)(A) of this section, constitutes critical habitat for *Labordia tinifolia* var. *wahiawaensis* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Streambanks (a) in lowland wet forests dominated by *Metrosideros polymorpha* and (b) containing one or more of the following associated species: *Cheirodendron* sp., *Dicranopteris linearis*, *Cyrtandra* sp., *Antidesma* sp., *Psychotria* sp., *Hedyotis terminalis*, or *Athyrium microphyllum*; and (2) elevations between 300 to 920 m (985 to 3,020 ft).

Family Malvaceae: *Hibiscadelphus woodii* (Hau Kuahiwi)

Kauai G, identified in the legal description in paragraph (a)(1)(i)(A) of

this section, constitutes critical habitat for *Hibiscadelphus woodii* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Basalt talus or cliff walls (a) in *Metrosideros polymorpha* montane mesic forest and (b) containing one or more of the following associated native plant species: *Bidens sandwicensis*, *Artemisia australis*, *Melicope pallida*, *Dubautia* sp., *Lepidium serra*, *Lipochaeta* sp., *Lysimachia glutinosa*, *Carex meyenii*, *Chamaesyce celastroides* var. *hanapeensis*, *Hedyotis* sp., *Nototrichium* sp., *Panicum lineale*, *Myrsine* sp., *Stenogyne campanulata*, *Lobelia niihauensis*, or *Poa mannii*; and (2) elevations around 915m (3,000 ft).

Family Malvaceae: *Hibiscus brackenridgei* (Ma'ō Hau Hele)

Maui units O, V, X, and Uu, identified in the legal descriptions in paragraph (a)(1)(i)(C) of this section, constitute critical habitat for *Hibiscus brackenridgei* on Maui. Within these units the currently known primary constituent elements of critical habitat for *Hibiscus brackenridgei* on Maui are the habitat components that provide: (1) Lowland dry forest sometimes with *Erythrina sandwicensis* as the dominant tree containing one or more of the following associated native plant species: *Myoporum* sp., *Chenopodium* sp., *Achyranthes* sp., *Nototrichium* sp., *Diospyros* sp., *Chamaesyce celastroides* var. *lorifolia*, *Dodonaea viscosa*, *Canthium odoratum*, *Eurya sandwicensis*, *Isachne distichophylla*, or *Sida fallax*; and (2) elevations between 130 to 800 m (425 to 2,625 ft).

Family Malvaceae: *Hibiscus clayi* (Clay's Hibiscus)

Kauai N, identified in the legal description in paragraph (a)(1)(i)(A) of this section, constitutes critical habitat for *Hibiscus clayi* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Slopes (a) in *Acacia koa* or *Diospyros* sp.-*Pisonia* sp.-*Metrosideros polymorpha* lowland dry or mesic forest and (b) containing one or more of the following associated native plant species: *Hedyotis acuminata*, *Pipturus* sp., *Psychotria* sp., *Cyanea hardyi*, *Artemisia australis*, or *Bidens* sp.; and (2) elevations between 230 to 350 m (750 to 1,150 ft).

Family Malvaceae: *Hibiscus waimeae* ssp. *hannerae* (Koki'o Ke'oke'o)

Kauai F, identified in the legal description in paragraph (a)(1)(i)(A) of this section, constitutes critical habitat

for *Hibiscus waimeae* ssp. *hannerae* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) *Metrosideros polymorpha-Dicranopteris linearis* or *Pisonia* sp.-*Charpentiera elliptica* lowland wet or mesic forest and containing one or more of the following associated native plant species: *Antidesma* sp., *Psychotria* sp., *Pipturus* sp., *Bidens* sp., *Bobea* sp., *Sadleria* sp., *Cyrtandra* sp., *Cyanea* sp., *Cibotium* sp., *Perrottetia sandwicensis*, or *Syzygium sandwicensis*; and (2) elevations between 190 and 560 m (620 and 1,850 ft).

Family Malvaceae: *Kokia kauaiensis* (Koki'o)

Kauai G and I, identified in the legal descriptions in paragraph (a)(1)(i)(A) of this section, constitute critical habitat for *Kokia kauaiensis* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Diverse mesic forest containing one or more of the following associated native plant species: *Acacia koa*, *Metrosideros polymorpha*, *Bobea* sp., *Diospyros sandwicensis*, *Hedyotis* sp., *Pleomele* sp., *Pisonia* sp., *Xylosma* sp., *Isodendron* sp., *Syzygium sandwicensis*, *Antidesma* sp., *Alyxia olivaeformis*, *Pouteria sandwicensis*, *Streblus pendulinus*, *Canthium odoratum*, *Nototrichium* sp., *Pteralyxia kauaiensis*, *Dicranopteris linearis*, *Hibiscus* sp., *Flueggea neowawraea*, *Rauvolfia sandwicensis*, *Melicope* sp., *Diellia laciniata*, *Tetraplasandra* sp., *Chamaesyce celastroides*, *Lipochaeta fauriei*, *Dodonaea viscosa*, *Santalum* sp., *Claoxylon* sp., or *Nestegis sandwicensis*; and (2) elevations between 350–660 m (1,150–2,165 ft).

Family Myrsinaceae: *Myrsine linearifolia* (Kolea)

Kauai F, G, H, I, L, and P, identified in the legal descriptions in paragraph (a)(1)(i)(A) of this section, constitute critical habitat for *Myrsine linearifolia* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Diverse mesic or wet lowland or montane *Metrosideros polymorpha* forest with (a) *Cheirodendron* sp. or *Dicranopteris linearis* as co-dominants, and (b) containing one or more of the following associated native plant species: *Dubautia* sp., *Cryptocarya mannii*, *Sadleria pallida*, *Myrsine* sp., *Syzygium sandwicensis*, *Machaerina angustifolia*, *Freycinetia arborea*, *Hedyotis terminalis*, *Cheirodendron* sp., *Bobea*

brevipes, *Nothoestrum* sp., *Melicope* sp., *Eurya sandwicensis*, *Psychotria* sp., *Lysimachia* sp., or native ferns; and (2) elevations between 585 to 1,280 m (1,920 to 4,200 ft).

Family Orchidaceae: *Platanthera holochila* (No Common Name)

(i.) Kauai H, identified in the legal description in paragraph (a)(1)(i)(A) of this section, constitutes critical habitat for *Platanthera holochila* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) *Metrosideros polymorpha-Dicranopteris linearis* montane wet forest or *M. polymorpha* mixed bog containing one or more of the following associated native plants: *Myrsine denticulata*, *Cibotium* sp., *Coprosma ernodeoides*, *Oreobolus furcatus*, *Styphelia tameiameia*, or *Vaccinium* sp.; and (2) elevations between 1,050 and 1,600 m (3,450 and 5,245 ft).

(ii.) Maui unit T, identified in the legal description in paragraph (a)(1)(i)(C) of this section, constitutes critical habitat for *Platanthera holochila* on Maui. Within this unit the currently known primary constituent elements of critical habitat for *Platanthera holochila* on Maui are the habitat components that provide: (1) *Metrosideros polymorpha-Dicranopteris linearis* montane wet forest or *Metrosideros polymorpha* mixed montane bog or mesic scrubby *Metrosideros polymorpha* forest containing one or more of the following associated native plants: *Cibotium* sp., *Coprosma ernodeoides*, *Oreobolus furcatus*, *Styphelia tameiameia*, *Wickstroemia* sp., *Scaevola chamissoniana*, *Sadleria* sp., *Lythrum maritimum*, *Deschampsia* sp., *Metrosideros polymorpha*, *Luzula hawaiiensis*, *Sisyrinchium acre*, *Broussaisia arguta*, *Clermontia* sp., *Lycopodium cernuum*, *Dubautia scabra*, *Polypodium pellucidum*, *Gahnia gahniiformis*, and *Vaccinium reticulatum*; and (2) elevations between 1,050 and 2,120 m (3,440 and 6,960 ft).

Family Plantaginaceae: *Plantago princeps* (Laukahi Kuahiwi)

(i.) Kauai G, K, P, and T, identified in the legal descriptions in paragraph (a)(1)(i)(A) of this section, constitute critical habitat for *Plantago princeps* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Steep slopes, rock walls, or bases of waterfalls (a) in mesic or wet *Metrosideros polymorpha* forest and (b) containing one or more of the following associated native plant species: *Dodonaea viscosa*, *Psychotria*

sp., *Dicranopteris linearis*, *Cyanea* sp., *Hedyotis* sp., *Melicope* sp., *Dubautia plantaginea*, *Exocarpos luteolus*, *Poa siphonoglossa*, *Nothoestrum peltatum*, *Remya montgomeryi*, *Stenogyne campanulata*, *Xylosma* sp., *Pleomele* sp., *Machaerina angustifolia*, *Athyrium* sp., *Bidens* sp., *Eragrostis* sp., *Lysimachia filifolia*, *Pipturus* sp., *Cyrtandra* sp., or *Myrsine linearifolia*; and (2) elevations between 480 to 1,100 m (1,580 to 3,610 ft).

(ii.) Maui unit Q, identified in the legal description in paragraph (a)(1)(i)(C) of this section, constitutes critical habitat for *Plantago princeps* on Maui. Within this unit the currently known primary constituent elements of critical habitat for *Plantago princeps* on Maui are the habitat components that provide: (1) Basalt cliffs (a) in *Metrosideros polymorpha* lowland wet forest; or *Acacia koa-Metrosideros polymorpha* montane wet forest; or *Metrosideros polymorpha* montane wet shrubland and (b) containing one or more of the following associated native plant species: *Eragrostis variabilis*, *Hedyotis formosa*, and *Dubautia plantaginea* spp. *humile*; and (2) elevations between 400 and 2,050 m (1,300 and 6,700 ft).

Family Poaceae: *Cenchrus agrimonoides* (Kamanomano (=Sandbur, Agrimony))

Maui unit Ss, identified in the legal description in paragraph (a)(1)(i)(C) of this section, constitutes critical habitat for *Cenchrus agrimonoides* on Maui. Within this unit the currently known primary constituent elements of critical habitat for *Cenchrus agrimonoides* on Maui are the habitat components that provide: (1) Rough a'a lava scree (a) in mesic *Metrosideros polymorpha-Acacia koa* forest and (b) containing one or more of the following associated native plant species: *Alyxia oliviformis*, *Canthium odoratum*, *Carex* sp., *Diospyros* sp., *Styphelia tameiameia*, or *Eragrostis variabilis*; and (2) elevations between 560 and 820 m (1,830 and 2,700 ft).

Family Poaceae: *Ischaemum byrone* (Hilo Ischaemum)

Maui units G, H, I, K, L, and M, identified in the legal descriptions in paragraph (a)(1)(i)(C) of this section, constitute critical habitat for *Ischaemum byrone* on Maui. Within these units the currently known primary constituent elements of critical habitat for *Ischaemum byrone* on Maui are the habitat components that provide: (1) Close proximity to the ocean, among rocks or on basalt cliffs (a) in coastal dry shrubland and (b) containing one or

more of the following associated native plant species: *Bidens* sp., *Fimbristylis cymosa*, or *Scaevola sericea*; and (2) elevations from sea level to 75 m (250 ft).

Family Poaceae: *Panicum niihauense* (Lau 'ehu)

Kauai J, identified in the legal description in paragraph (a)(1)(i)(A) of this section, constitutes critical habitat for *Panicum niihauense* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Sand dunes (a) in coastal shrubland and (b) containing one or more of the following associated native plant species: *Dodonaea viscosa*, *Cassytha filiformis*, *Scaevola sericea*, *Sida fallax*, *Vitex rotundifolia*, or *Sporobolus* sp.; and (2) elevations of 100 m or less (330 ft).

Family Poaceae: *Poa mannii* (Mann's Bluegrass)

Kauai G, identified in the legal description in paragraph (a)(1)(i)(A) of this section, constitutes critical habitat for *Poa mannii* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Cliffs, rock faces, or stream banks (a) in lowland or montane wet, dry, or mesic *Metrosideros polymorpha* or *Acacia koa-Metrosideros polymorpha* montane mesic forest and (b) containing one or more of the following associated native plant species: *Alectryon macrococcus*, *Antidesma platyphyllum*, *Bidens cosmoides*, *Chamaesyce celastroides* var. *hanapepens*, *Artemisia australis*, *Bidens sandwicensis*, *Lobelia sandwicensis*, *Wilkesia gymnoxiphium*, *Eragrostis variabilis*, *Panicum lineale*, *Mariscus phloides*, *Luzula hawaiiensis*, *Carex meyenii*, *C. wahuensis*, *Cyrtandra wawrae*, *Dodonaea viscosa*, *Exocarpos luteolus*, *Labordia helleri*, *Nototrichium* sp., *Schiedea amplexicaulis*, *Hedyotis terminalis*, *Melicope anisata*, *M. barbiger*, *M. pallida*, *Pouteria sandwicensis*, *Schiedea membranacea*, *Diospyros sandwicensis*, *Psychotria mariniiana*, *P. greenwelliae*, or *Kokia kauaiensis*; and (2) elevations between 460 and 1,150 m (1,510 and 3,770 ft).

Family Poaceae: *Poa sandwicensis* (Hawaiian Bluegrass)

Kauai G and I, identified in the legal descriptions in paragraph (a)(1)(i)(A) of this section, constitute critical habitat for *Poa sandwicensis* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Wet, shaded, gentle or steep

slopes, ridges, or rock ledges (a) in semi-open or closed, mesic or wet, diverse montane forest dominated by *Metrosideros polymorpha* and (b) containing one or more of the following associated native species: *Dodonaea viscosa*, *Dubautia* sp., *Coprosma* sp., *Melicope* sp., *Dianella sandwicensis*, *Alyxia olivaeformis*, *Bidens* sp., *Dicranopteris linearis*, *Schiedea stellarioides*, *Peperomia macraeana*, *Claoxylon sandwicense*, *Acacia koa*, *Psychotria* sp., *Hedyotis* sp., *Scaevola* sp., *Cheirodendron* sp., or *Syzygium sandwicensis*; and (2) elevations between 1,035 to 1,250 m (3,400 to 4,100 ft).

Family Poaceae: *Poa siphonoglossa* (No Common Name)

Kauai G, I, and U, identified in the legal descriptions in paragraph (a)(1)(i)(A) of this section, constitute critical habitat for *Poa siphonoglossa* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Shady banks near ridge crests (a) in mesic *Metrosideros polymorpha* forest and (b) containing one or more of the following associated native plant species: *Acacia koa*, *Psychotria* sp., *Scaevola* sp., *Alphitonia ponderosa*, *Zanthoxylum dipetalum*, *Tetraplasandra kauaiensis*, *Dodonaea viscosa*, *Hedyotis* sp., *Melicope* sp., *Vaccinium* sp., *Styphelia tameiameia*, *Carex meyenii*, *Carex wahuensis*, or *Wilkesia gymnoxiphium*; and (2) elevations between 1,000 to 1,200 m (3,300 and 3,900 ft).

Family Primulaceae: *Lysimachia filifolia* (No Common Name)

Kauai T, identified in the legal description in paragraph (a)(1)(i)(A) of this section, constitutes critical habitat for *Lysimachia filifolia* on Kauai. Within

this unit, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Mossy banks at the base of cliff faces within the spray zone of waterfalls or along streams in lowland wet forests and containing one or more of the following associated native plant species: mosses, ferns, liverworts, *Machaerina* sp., *Heteropogon contortus*, or *Melicope* sp.; and (2) elevations between 240 to 680 m (800 to 2,230 ft).

Family Primulaceae: *Lysimachia lydgatei* (No Common Name)

Maui unit Q, identified in the legal description in paragraph (a)(1)(i)(C) of this section, constitutes critical habitat for *Lysimachia lydgatei* on Maui. Within this unit the currently known primary constituent elements of critical habitat for *Lysimachia lydgatei* on Maui are the habitat components that provide: (1) Sides of steep ridges (a) in *Metrosideros polymorpha-Dicranopteris linearis* dominated wet to mesic shrubland or *Metrosideros polymorpha-Cheirodendron* sp. montane forest and (b) containing one or more of the following associated native plant species: *Lycopodium* sp., *Ilex* sp., *Dodonaea viscosa*, *Vaccinium* sp., *Eurya* sp., *Styphelia tameiameia*, *Coprosma* sp., *Ochna* sp., *Astelia* sp., *Broussaisia arguta* or mat ferns; and (2) elevations between 915 and 1,415 m (3,000 and 4,640 ft).

Family Rhamnaceae: *Colubrina oppositifolia* (Kauila)

Maui unit Ss, identified in the legal description in paragraph (a)(1)(i)(C) of this section, constitutes critical habitat for *Colubrina oppositifolia* on Maui. Within this unit the currently known primary constituent elements of critical habitat for *Colubrina oppositifolia* on Maui are the habitat components that

provide: (1) Lowland dry and mesic forests dominated by *Diospyros sandwicensis* containing one or more of the following associated native plant species: *Dodonaea viscosa*, *Canavalia* sp., *Wikstroemia* sp., *Canthium odoratum*, or *Reynoldsia sandwicensis*; and (2) elevations between 240–915 m (800 and 3,000 ft).

Family Rhamnaceae: *Gouania meyenii* (No Common Name)

Kauai G and I, identified in the legal descriptions in paragraph (a)(1)(i)(A) of this section, constitute critical habitat for *Gouania meyenii* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Rocky ledges, cliff faces, or ridge tops (a) in dry shrubland or *Metrosideros polymorpha* lowland mesic forest and (b) containing one or more of the following native plant species: *Dodonaea viscosa*, *Chamaesyce* sp., *Psychotria* sp., *Hedyotis* sp., *Melicope* sp., *Nestegis sandwicensis*, *Bidens* sp., *Carex meyenii*, *Diospyros* sp., *Lysimachia* sp., or *Senna gaudichaudii*; and (2) elevations between 490 to 880 m (1,600 to 2,880 ft).

Family Rubiaceae: *Hedyotis cookiana* ('Awiwi)

Kauai G, identified in the legal description in paragraph (a)(1)(i)(A) of this section, constitutes critical habitat for *Hedyotis cookiana* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Streambeds or steep cliffs close to water sources in lowland wet forest communities; and (2) elevations between 170 and 370 m (560 and 1,210 ft).

Family Rubiaceae: *Hedyotis coriacea* (Kio'ele)

Maui unit X, identified in the legal description in paragraph (a)(1)(i)(C) of this section, constitutes critical habitat for *Hedyotis coriacea* on Maui. Within this unit the currently known primary constituent elements of critical habitat for *Hedyotis coriacea* on Maui are the habitat components that provide: (1) Steep, rocky, slopes (a) in dry lowland *Dodonaea viscosa* dominated shrublands and (b) containing one or more of the following associated native plant species: *Sida fallax*, *Gouania hillebrandii*, *Bidens menziesii*, *Lipochaeta livarum*, *Myoporum* sp., or *Schiedea menziesii*; and (2) elevation of 470 to 2,300 m (1,540 to 7,550 ft).

Family Rubiaceae: *Hedyotis mannii* (Pilo)

Maui unit Q, identified in the legal description in paragraph (a)(1)(i)(C) of this section, constitutes critical habitat for *Hedyotis mannii* on Maui. Within this unit the currently known primary constituent elements of critical habitat for *Hedyotis mannii* on Maui are the habitat components that provide: (1) Basalt cliffs along stream banks (a) in *Metrosideros polymorpha-Dicranopteris linearis* montane wet forest and (b) containing one or more of the following associated native plant species: *Machaerina* sp., *Carex meyenii*, *Phyllostegia* sp., *Hedyotis acuminata*, *Cyrtandra platyphylla*, *Cyanea* sp., and *Isachne distichophylla*; and (2) elevation of 826 to 882 m (2,800 to 3,000 ft).

Family Rubiaceae: *Hedyotis st.-johnii* (Na Pali Beach *Hedyotis*)

Kauai G and J, identified in the legal descriptions in paragraph (a)(1)(i)(A) of

this section, constitute critical habitat for *Hedyotis st.-johnii* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Crevices of north-facing, near-vertical coastal cliff faces within the spray zone (a) in sparse dry coastal shrubland and (b) containing one or more of the following native plant species: *Myoporum sandwicense*, *Eragrostis variabilis*, *Lycium sandwicense*, *Heteropogon contortus*, *Artemisia australis* or *Chamaesyce celastroides*; and (2) elevations above 75 m (250 ft).

Family Rutaceae: *Melicope adscendens* (Alani)

Maui unit Ss, identified in the legal description in paragraph (a)(1)(i)(C) of this section, constitutes critical habitat for *Melicope adscendens* on Maui. Within this unit the currently known primary constituent elements of critical habitat for *Melicope adscendens* on Maui are the habitat components that provide: (1) A'a lava with pockets of soil (a) in *Nestegis sandwicensis-Pleomele* lowland mesic forest or open dry forest and (b) containing one or more of the following associated native plant taxa: *Pleomele auwahiensis*, *Dodonaea viscosa*, *Osteomeles anthyllidifolia*, *Alphitonia ponderosa*, *Chamaesyce celastroides* var. *lorifolia*, *Santalum ellipticum*, *Pouteria sandwicensis*, *Styphelia tameiameia* or *Xylosma hawaiiensis*; and (2) elevations between 768 and 1,220 m (2,520 and 4,000 ft).

Family Rutaceae: *Melicope haupuensis* (Alani)

Kauai G and I, identified in the legal descriptions in paragraph (a)(1)(i)(A) of this section, constitute critical habitat for *Melicope haupuensis* on Kauai.

Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Moist talus slopes (a) in *Metrosideros polymorpha* dominated lowland mesic forests or *Metrosideros polymorpha-Acacia koa* montane mesic forest and (b) containing one or more of the following associated native plant species: *Dodonaea viscosa*, *Diospyros* sp., *Psychotria maritima*, *P. greenwelliae*, *Melicope ovata*, *M. anisata*, *M. barbiger*, *Dianella sandwicensis*, *Pritchardia minor*, *Tetraplasandra waimeae*, *Claoxylon sandwicensis*, *Cheirodendron trigynum*, *Pleomele aurea*, *Cryptocarya mannii*, *Pouteria sandwicensis*, *Bobea brevipes*, *Hedyotis terminalis*, *Elaeocarpus bifidus*, or *Antidesma* sp.; and (2) elevations between 375 to 1,075 m (1,230 to 3,530 ft).

Family Rutaceae: *Melicope knudsenii* (Alani)

(i.) Kauai G and I, identified in the legal descriptions in paragraph (a)(1)(i)(A) of this section, constitute critical habitat for *Melicope knudsenii* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Forested flats or talus slopes (a) in lowland dry or montane mesic forests and (b) containing one or more of the following associated native plant species: *Dodonaea viscosa*, *Antidesma* sp., *Metrosideros polymorpha*, *Xylosma* sp., *Hibiscus* sp., *Myrsine lanaiensis*, *Diospyros* sp., *Rauvolfia sandwicensis*, *Bobea* sp., *Nestegis sandwicensis*, *Hedyotis* sp., *Melicope* sp., *Psychotria* sp., or *Pittosporum kauaiensis*; and (2) elevations between 450 to 1,000 m (1,480 to 3,300 ft).

(ii.) Maui unit Ss, identified in the legal description in paragraph (a)(1)(i)(C) of this section, constitutes critical habitat for *Melicope knudsenii* on Maui. Within this unit the currently known primary constituent elements of critical habitat for *Melicope knudsenii* on Maui are the habitat components that provide: (1) Forested flats or talus slopes (a) in *Nestegis-Pleomele* mixed open dry forests and (b) containing one or more of the following associated native plant species: *Dodonaea viscosa*, *Osteomeles anthyllidifolia*, *Alphitonia ponderosa*, *Santalum ellipticum*, or *Xylosma hawaiiense*; and (2) elevations between 450 and 1,220 m (1,480 and 4,000 ft).

Family Rutaceae: *Melicope mucronulata* (Alani)

Maui unit Ss, identified in the legal description in paragraph (a)(1)(i)(C) of this section, constitutes critical habitat for *Melicope mucronulata* on Maui. Within this unit the currently known primary constituent elements of critical habitat for *Melicope mucronulata* on Maui are the habitat components that provide: (1) Steep west or north-facing slopes (a) in lowland dry to mesic forest and (b) containing one or more of the following associated species: *Dodonaea viscosa*, *Metrosideros polymorpha*, *Styphelia tameiameia*, or *Dubautia linearis*; and (2) elevations between 670 and 1,070 m (2,200 and 3,500 ft).

Family Rutaceae: *Melicope pallida* (Alani)

Kauai G and I, identified in the legal descriptions in paragraph (a)(1)(i)(A) of this section, constitute critical habitat for *Melicope pallida* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Steep rock faces (a) in lowland or montane mesic or wet forests

or shrubland and (b) containing one or more of the following associated native plant species: *Dodonaea viscosa*, *Lepidium serra*, *Pleomele* sp., *Boehmeria grandis*, *Coprosma* sp., *Hedyotis terminalis*, *Melicope* sp., *Pouteria sandwicensis*, *Poa mannii*, *Schiedea membranacea*, *Psychotria mariniana*, *Dianella sandwicensis*, *Pritchardia minor*, *Chamaesyce celastroides* var *hanapepensis*, *Nototrichium* sp., *Carex meyenii*, *Artemisia* sp., *Abutilon sandwicense*, *Alyxia olivaeformis*, *Dryopteris* sp., *Metrosideros polymorpha*, *Pipturus albidus*, *Sapindus oahuensis*, *Tetraplasandra* sp., or *Xylosma hawaiiense*; and (2) elevations between 490 to 915 m (1,600 to 3,000 ft).

Family Rutaceae: *Zanthoxylum hawaiiense* (A'e)

(i.) Kauai I, identified in the legal description in paragraph (a)(1)(i)(A) of this section, constitutes critical habitat for *Zanthoxylum hawaiiense* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Lowland dry or mesic forests, or montane dry forest, (a) dominated by *Metrosideros polymorpha* or *Diospyros sandwicensis*, and (b) containing one or more of the following associated plant species: *Pleomele auwahiensis*, *Antidesma platyphyllum*, *Pisonia* sp., *Alectryon macrococcus*, *Charpentiera* sp., *Melicope* sp., *Streblus pendulinus*, *Myrsine lanaiensis*, *Sophora chrysophylla*, or *Dodonaea viscosa*; and (2) elevations between 550 and 730 m (1,800 and 2,400 ft).

(ii.) Maui unit Ss, identified in the legal description in paragraph (a)(1)(i)(C) of this section, constitutes critical habitat for *Zanthoxylum hawaiiense* on Maui. Within this unit the currently known primary

constituent elements of critical habitat for *Zanthoxylum hawaiiense* on Maui are the habitat components that provide: (1) Open lowland dry or mesic *Nestegis sandwicensis-Pleomele auwahiensis* forests, or montane dry forest containing one or more of the following associated native species: *Metrosideros polymorpha*, *Diospyros sandwicensis*, *Pisonia* sp., *Xylosma hawaiiense*, *Santalum ellipticum*, *Alphitonia ponderosa*, *Osteomeles anthyllidifolia*, *Alectryon macrococcus*, *Charpentiera* sp., *Melicope* sp., *Dodonaea viscosa*, *Streblus pendulinus*, *Myrsine lanaiensis*, or *Sophora chrysophylla*; and (2) elevations between 550 and 1,740 m (1,800 and 5,710 ft).

Family Santalaceae: *Exocarpos luteolus* (Heau)

Kauai G, H, I, L, and S, identified in the legal descriptions in paragraph (a)(1)(i)(A) of this section, constitute critical habitat for *Exocarpos luteolus* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Wet places bordering swamps; open, dry ridges (a) in lowland or montane *Metrosideros polymorpha* dominated wet forest communities and (b) containing one or more of the following native plant species: *Acacia koa*, *Cheirodendron trigynum*, *Pouteria sandwicensis*, *Dodonaea viscosa*, *Pleomele aurea*, *Psychotria mariniana*, *Psychotria greenwelliae*, *Bobea brevipes*, *Hedyotis terminalis*, *Elaeocarpus bifidus*, *Melicope haupuensis*, *Dubautia laevigata*, *Dianella sandwicensis*, *Poa sandwicensis*, *Schiedea stellarioides*, *Peperomia macraeana*, *Claoxylon sandwicense*, *Santalum freycinetianum*, *Styphelia tameiameia*, or *Dicranopteris linearis*; and (2) elevations between 475 and 1,290 m (1,560 and 4,220 ft).

Family Sapindaceae: *Alectryon macrococcus* (Mahoe)

(i.) Kauai G, I, and U, identified in the legal descriptions in paragraph (a)(1)(i)(A) of this section, constitute critical habitat for *Alectryon macrococcus* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Dry slopes or gulches (a) in *Diospyros* sp., *Metrosideros polymorpha* lowland mesic forest, *Metrosideros polymorpha* mixed mesic forest, or *Diospyros* sp. mixed mesic forest, (b) containing one or more of the following native plant species: *Nestegis sandwicensis*, *Psychotria* sp., *Pisonia* sp., *Xylosma* sp., *Streblus pendulinus*, *Hibiscus* sp., *Antidesma* sp., *Pleomele* sp., *Acacia koa*, *Melicope knudsenii*, *Hibiscus waimeae*, *Pteralyxia* sp., *Zanthoxylum* sp., *Kokia kauaiensis*, *Rauvolfia sandwicensis*, *Myrsine lanaiensis*, *Canthium odoratum*, *Canavalia* sp., *Alyxia oliviformis*, *Nesoluma polynesianum*, *Munroidendron racemosum*, *Caesalpinia kauaiense*, *Tetraplasandra* sp., *Pouteria sandwicensis*, or *Bobea timonioides*; and (2) elevations between 360 to 1,070 m (1,180 to 3,510 ft).

(ii.) Maui units Q, Rr, and Ss, identified in the legal descriptions in paragraph (a)(1)(i)(C) of this section, constitute critical habitat for *Alectryon macrococcus* on Maui. Within these units the currently known primary constituent elements of critical habitat for *Alectryon macrococcus* var. *auwahiensis* on Maui are the habitat components that provide: (1) Mixed

lowland dry forest containing one or more of the following associated native plant species: *Diospyros sandwicensis*, *Dodonaea viscosa*, *Osteomeles anthyllidifolia*, *Alphitonia ponderosa*, *Santalum ellipticum*, *Xylosma hawaiiensis*, *Nestegis sandwicensis*, *Streblus pendulinus*, or *Pleomele auwahiensis*; and (2) elevations of 360 to 1,070 m (1,180 to 3,510 ft). Within these units the currently known primary constituent elements of critical habitat for *Alectryon macrococcus* var. *macrococcus* on Maui are the habitat components that provide: (1) Dry slopes or gulches (a) in dense mesic mixed *Metrosideros polymorpha* forest or *Diospyros sandwicensis* forest which contain (b) one or more of the following associated native plant species: *Nestegis sandwicensis* or *Antidesma platyphylla*; and (2) elevations of 360 to 1,070 m (1,180 to 3,510 ft).

Family Solanaceae: *Nothocestrum peltatum* ('Aiea)

Kauai G and I, identified in the legal descriptions in paragraph (a)(1)(i)(A) of this section, constitute critical habitat for *Nothocestrum peltatum* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Rich soil on steep slopes (a) in montane or lowland mesic or wet forest dominated by *Acacia koa* or a mixture of *Acacia koa* and *Metrosideros polymorpha*, and (b) containing one or more of the following associated native plant species: *Antidesma* sp., *Dicranopteris linearis*, *Bobea brevipes*, *Elaeocarpus bifidus*, *Alphitonia*

ponderosa, *Melicope anisata*, *M. barbiger*, *M. haupeensis*, *Pouteria sandwicensis*, *Dodonaea viscosa*, *Dianella sandwicensis*, *Tetraplasandra kauaiensis*, *Claoxylon sandwicensis*, *Cheirodendron trigynum*, *Psychotria mariniana*, *P. greenwelliae*, *Hedyotis terminalis*, *Ilex anomala*, *Xylosma* sp., *Cryptocarya mannii*, *Coprosma* sp., *Pleomele aurea*, *Diplazium sandwicensis*, *Broussaisia arguta*, or *Perrottetia sandwicensis*; and (2) elevations between 915 to 1,220 m (3,000 to 4,000 ft).

Family Solanaceae: *Solanum sandwicense* ('Aiakeakua, Popolu)

Kauai D, G, and I, identified in the legal descriptions in paragraph (a)(1)(i)(A) of this section, constitute critical habitat for *Solanum sandwicense* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Open, sunny areas (a) in diverse lowland or montane mesic or wet forests and (b) containing one or more of the following associated plants: *Alphitonia ponderosa*, *Ilex anomala*, *Xylosma* sp., *Athyrium sandwicensis*, *Syzygium sandwicensis*, *Bidens cosmoides*, *Dianella sandwicensis*, *Poa siphonoglossa*, *Carex meyenii*, *Hedyotis* sp., *Coprosma* sp., *Dubautia* sp., *Pouteria sandwicensis*, *Cryptocarya mannii*, *Acacia koa*, *Metrosideros polymorpha*, *Dicranopteris linearis*, *Psychotria* sp., or *Melicope* sp.; and (2) elevations between 760 and 1,220 m (2,500 and 4,000 ft).

Family Urticaceae: *Neraudia sericea* (No Common Name)

Maui units T and Qq, identified in the legal descriptions in paragraph (a)(1)(i)(C) of this section, constitute critical habitat for *Neraudia sericea* on Maui. Within these units the currently known primary constituent elements of critical habitat for *Neraudia sericea* on Maui are the habitat components that provide: (1) Lowland dry to mesic *Metrosideros polymorpha-Dodonaea viscosa-Styphelia tameiameia* shrubland or forest or *Acacia koa* forest containing one or more of the following associated native plant taxa: *Huperzia mannii*, *Urera glabra*, *Cyrtandra oxybapha*, *Cyrtandra platyphylla*, *Sida fallax*, *Diospyros* sp., *Bobea* sp., *Coprosma* sp., or *Hedyotis* sp.; and (2) elevations between 670 and 1,480 m (2,200 and 4,850 ft).

Family Violaceae: *Isodendron laurifolium* (Aupaka)

Kauai G, I, and U, identified in the legal descriptions in paragraph (a)(1)(i)(A) of this section, constitute critical habitat for *Isodendron laurifolium* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Diverse mesic or wet forest (a) dominated by *Metrosideros polymorpha*, *Acacia koa*, or *Diospyros* sp. and (b) containing one or more of the following associated native plant species: *Kokia kauaiensis*, *Streblus* sp., *Elaeocarpus bifidus*, *Canthium odoratum*, *Antidesma* sp., *Xylosma hawaiiense*, *Hedyotis terminalis*, *Pisonia* sp., *Nestegis sandwicensis*, *Dodonaea viscosa*, *Euphorbia haeleeleana*, *Pleomele* sp., *Pittosporum* sp., *Melicope* sp., *Claoxylon sandwicense*, *Alphitonia ponderosa*, *Myrsine lanaiensis*, or *Pouteria sandwicensis*; and (2) elevations between 490 and 820 m (1,600 and 2,700 ft).

Family Violaceae: *Isodendron longifolium* (Aupaka)

Kauai F, G, L, M, and P, identified in the legal descriptions in paragraph

(a)(1)(i)(A) of this section, constitute critical habitat for *Isodendron longifolium* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Steep slopes, gulches, or stream banks (a) in mesic or wet *Metrosideros polymorpha* forests and (b) containing one or more of the following native species: *Dicranopteris linearis*, *Eugenia* sp., *Diospyros* sp., *Pritchardia* sp., *Canthium odoratum*, *Melicope* sp., *Cheirodendron* sp., *Ilex anomala*, *Pipturus* sp., *Hedyotis fluviatilis*, *Peperomia* sp., *Bidens* sp., *Nestegis sandwicensis*, *Cyanea hardyi*, *Syzygium* sp., *Cibotium* sp., *Bobea brevipes*, *Antidesma* sp., *Cyrtandra* sp., *Hedyotis terminalis*, *Peperomia* sp., *Perrottetia sandwicensis*, *Pittosporum* sp., or *Psychotria* sp.; and (2) elevations between 410 to 760 m (1,345 to 2,500 ft).

Family Violaceae: *Viola helenae* (No Common Name)

Kauai L, identified in the legal description in paragraph (a)(1)(i)(A) of this section, constitutes critical habitat for *Viola helenae* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Stream banks or adjacent valley bottoms with light to moderate shade in *Metrosideros polymorpha-Dicranopteris linearis* lowland wet forest; and (2) elevations between 610–855 m (2,000–2,800 ft).

Family Violaceae: *Viola kauaiensis* var. *wahiawaensis* (Nani Wai'ale'ale)

Kauai L, identified in the legal description in paragraph (a)(1)(i)(A) of this section, constitutes critical habitat for *Viola kauaiensis* var. *wahiawaensis* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Open montane bog or wet shrubland containing one or more of the following native plant species: *Dicranopteris linearis*, *Diplopterygium pinnatum*, *Syzygium sandwicensis*, or *Metrosideros polymorpha*; and (2)

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

(B) *Ferns and Allies*

Family Adiantaceae: *Pteris lidgatei* (No Common Name)

Maui units Q and Aa, identified in the legal descriptions in paragraph (a)(1)(i)(C) of this section, constitute critical habitat for *Pteris lidgatei* on Maui. Within these units the currently known primary constituent elements of critical habitat for *Pteris lidgatei* on Maui are the habitat components that provide: (1) Steep stream banks (a) in wet *Metrosideros polymorpha-Dicranopteris linearis* montane forest and (b) containing one or more of the following native plant taxa: *Cibotium chamissoi*, *Dicranopteris linearis*, *Elaphoglossum crassifolium*, *Sadleria squarrosa*, or *Sphenomeris chusana*; and (2) elevations between 915 and 1,070 m (3,000 and 3,500 ft).

Family Aspleniaceae: *Ctenitis squamigera* (Pauoa)

Maui units Q, T, Xx, and Zz, identified in the legal descriptions in paragraph (a)(1)(i)(C) of this section, constitute critical habitat for *Ctenitis squamigera* on Maui. Within these units the primary constituent elements of critical habitat for *Ctenitis squamigera* on Maui are the habitat components that provide: Forest understory (a) in *Metrosideros polymorpha* montane wet forest, *Metrosideros polymorpha-Diospyros* sp. mesic forest or diverse mesic forest and (b) containing one or more of the following native plant species: *Alyxia oliviformis*, *Freycinetia arborea*, *Coprosma* sp., *Pleomele* sp., *Thelypteris globulifera*, *Sadleria* sp., *Doodia* sp., *Pittosporum* sp., *Dryopteris* sp., *Bobea* sp., *Antidesma* sp., *Peperomia* sp., *Dicranopteris linearis*, *Schiedea pubescens* var. *pubescens*, *Hibiscus kokio* ssp. *kokio*, *Hedyotis formosa*, *Pritchardia forbesiana*, *Myrsine* sp., *Psychotria* sp., or *Xylosma* sp.; and (2) elevations between 380 and 1,000 m (1,250 and 3,280 feet).

Family Aspleniaceae: *Diellia erecta* (No Common Name)

Maui units Q, T, and Qq, identified in the legal descriptions in paragraph (a)(1)(i)(C) of this section, constitute critical habitat for *Diellia erecta* on Maui. Within these units the currently known primary constituent elements of critical habitat for *Diellia erecta* on Maui are the habitat components that provide: (1) Steep slopes or gulch bottoms in deep shade (a) in *Diospyros sandwicensis*-*Metrosideros polymorpha* lowland mesic forest and (b) containing one or more of the following associated native plant species: *Nestegis* sp., *Styphelia tameiameia*, *Melicope* sp., *Coprosma* sp., *Dodonaea viscosa*, *Dryopteris unidentata*, *Myrsine* sp., *Psychotria* sp., *Pleomele auwahiensis*, *Syzygium sandwicensis*, or *Wikstroemia* sp.; and (2) elevations between 210 and 1,590 m (700 and 5,200 ft).

Family Aspleniaceae: *Diellia pallida* (No Common Name)

Kauai G and I, identified in the legal descriptions in paragraph (a)(1)(i)(A) of this section, constitute critical habitat for *Diellia pallida* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Bare soil on steep, rocky, dry slopes (a) in lowland mesic forests and (b) containing one or more of the following native plant species: *Acacia koa*, *Alectryon macrococcus*, *Antidesma platyphyllum*, *Metrosideros polymorpha*, *Myrsine lanaiensis*, *Zanthoxylum dipetalum*, *Tetraplasandra kauaiensis*, *Psychotria mariniana*, *Carex meyenii*, *Diospyros hillebrandii*, *Hedyotis knudsenii*,

Canthium odoratum, *Pteralyxia kauaiensis*, *Nestegis sandwicensis*, *Alyxia olivaeformis*, *Wilkesia gymnoxiphium*, *Alphitonia ponderosa*, *Styphelia tameiameia*, or *Rauvolfia sandwicensis*; and (2) elevations between 530 to 915 m (1,700 to 3,000 ft).

Family Aspleniaceae: *Diplazium molokaiense* (No Common Name)

Maui unit Qq, identified in the legal description in paragraph (a)(1)(i)(C) of this section, constitutes critical habitat for *Diplazium molokaiense* on Maui. Within this unit the currently known primary constituent elements of critical habitat for *Diplazium molokaiense* on Maui are the habitat components that provide: (1) Proximity to waterfalls in lowland or montane mesic *Metrosideros polymorpha*-*Acacia koa* forest; and (2) elevations between 850 and 1,680 m (2,800 and 5,500 ft).

Family Grammitidaceae: *Adenophorus periens* (Pendant Kihi Fern)

Kauai F, G, K, L, P, and R, identified in the legal descriptions in paragraph (a)(1)(i)(A) of this section, constitute critical habitat for *Adenophorus periens* on Kauai. Within these units, the currently known primary constituent elements of critical habitat are habitat components that provide: (1) Well-developed, closed canopy that provides deep shade or high humidity (a) In *Metrosideros polymorpha*-*Cibotium glaucum* lowland wet forests, open *Metrosideros polymorpha* montane wet forest, or *Metrosideros polymorpha*-*Dicranopteris linearis* lowland wet forest, and (b) containing one or more of the following native plant species: *Athyrium sandwicensis*, *Broussaisia* sp.,

Cheirodendron trigynum, *Cyanea* sp., *Cyrtandra* sp., *Dicranopteris linearis*, *Freycinetia arborea*, *Hedyotis terminalis*, *Labordia hirtella*, *Machaerina angustifolia*, *Psychotria* sp., *Psychotria hexandra*, or *Syzygium sandwicensis*; and (2) elevations between 400 and 1,265 m (1,310 and 4,150 ft).

Family Lycopodiaceae: *Phlegmariurus mannii* (Wawae'iole)

Maui units Q, W, Jj, Kk, and Qq, identified in the legal descriptions in paragraph (a)(1)(i)(C) of this section, constitute critical habitat for *Phlegmariurus mannii* on Maui. Within these units the currently known primary constituent elements of critical habitat for *Phlegmariurus mannii* on Maui are the habitat components that provide: (1) As an epiphyte on *Metrosideros polymorpha*, and *Acacia koa* trees in moist protected gulches (a) in mesic to wet montane *Metrosideros polymorpha*-*Acacia koa* forests or wet montane *Metrosideros polymorpha*-*Acacia koa* forests and (b) containing one or more of the following associated native plant taxa: *Thelypteris* sp., *Athyrium* sp., *Styphelia* sp., *Cyanea atra*, *Machaerina* sp., *Cyrtandra* sp., *Sadleria* sp., *Vaccinium* sp., *Dodonaea viscosa*, *Astelia menziesii*, *Coprosma* sp., *Cheirodendron trigynum*, *Ilex anomala*, or *Myrsine* sp.; and (2) elevations from 900 to 1,600 m (2,950 to 5,250 ft).

Dated: November 29, 2000.

Kenneth L. Smith,

Acting Assistant Secretary for Fish and Wildlife and Parks.

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