DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

RIN 1018–AH70

Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for 60 Plant Species from the Islands of Maui and Kahoolawe, HI

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Final rule.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), designate critical habitat pursuant to the Endangered Species Act of 1973, as amended (Act), for 60 of 70 listed plant species known historically from the Hawaiian islands of Maui and Kahoolawe. A total of approximately 37,717 hectares (ha) (93,200 acres (ac)) of land on the island of Maui and 1,180 ha (2,915 ac) of land on the island of Kahoolawe fall within the boundaries of the 139 critical habitat units designated for the 60 species. This critical habitat designation requires the Service to consult under section 7 of the Act with regard to actions carried out, funded, or authorized by a Federal agency. Section 4 of the Act requires us to consider economic and other relevant impacts when specifying any particular area as critical habitat. We solicited data and comments from the public on all aspects of the proposed rule, including data on economic and other impacts of the designation.

DATES: This rule becomes effective on June 13, 2003.

ADDRESSES: Comments and materials received, as well as supporting documentation, used in the preparation of this final rule will be available for public inspection, by appointment, during normal business hours at U.S. Fish and Wildlife Service, Pacific Islands Office, 300 Ala Moana Blvd., Room 3–122, P.O. Box 50088, Honolulu, HI 96850–0001.

FOR FURTHER INFORMATION CONTACT: Paul Henson, Field Supervisor, Pacific Islands Office at the above address (telephone 808/541–3441; facsimile 808/541–3470).

SUPPLEMENTARY INFORMATION:

Background

In the List of Endangered and Threatened Plants (50 CFR 17.12(h)), there are 70 plant species that, at the time of listing, were reported from the islands of Maui and/or Kahoolawe (Table 1).

TABLE 1.—SUMMARY OF ISLAND DISTRIBUTION OF 70 SPECIES FROM MAUI AND KAHOOLAWE

Species (common name)	Island distribution						
	Kauai	Oahu	Molokai	Lanai	Maui	Hawaii	NW Isles, Kahoolawe, Niihau
Acaena exigua (liliwai)	H				H		
Adenophorus periens (pendent kihi fern).	C	C	C	R	R	C	
Alectryon macrococcus (mahoe)	C	C	C		C		
Argyroxiphium sandwicense ssp. *macrocephalum* (ahinahina).					C		
Asplenium fragile var. *insulare* (NCN)					C	C	
Bidens micrantha ssp. *kalealaha* (kookoolau).				H	C		
Bonamia menziesii (NCN)	C	C	H	C	C	C	
Brighamia rockii (pua ala)			C	H	H		
Cenchrus agrimonioides (kamanomano)		C		H	C	R	NW Isles (H)
Centaurium sebaeoides (awiwi)	C	C	C	C	C		
Clermontia lindseyana (oha wai)					C	C	
Clermontia oblongifolia ssp. mauiensis (oha wai).				C	C		
Clermontia peleana (oha wai)					H	C	
Clermontia samuelii (oha wai)					C		
Colubrina oppositifolia (kauila)		C			C	C	
Ctenitis squamigera (pauoa)	H	C	C	C	C	H	
Cyanea copelandii ssp. *haleakalaensis* (haha).					C		
Cyanea glabra (haha)					C		
Cyanea grimesiana ssp. *grimesiana* (haha).		C	C	C	C		
Cyanea hamatiflora ssp. *hamatiflora* (haha).					C		
Cyanea lobata (haha)				H	C		
Cyanea mceldowneyi (haha)					C		
Cyrtandra munroi (haiwale)				C	C		
Delissea undulata (NCN)	C				H	C	Ni (H)
Diellia erecta (asplenium-leaved diellia)	H	H	C	H	C	C	
Diplazium molokaiense (NCN)	H	H	H	H	C		
Dubautia plantaginea ssp. *humilis* (naenae).					C		
Flueggea neowawraea (mehamehame)	C	C	H		C	C	
Geranium arboreum (nohoanu)					C		
Geranium multiflorum (nohoanu)					C		
Gouania vitifolia (NCN)		C			H	C	
Hedyotis coriacea (kioele)		H			C	C	
Hedyotis mannii (pilo)			C	C	C		
Hesperomannia arborescens (NCN)		C	C	H	C		

TABLE 1.—SUMMARY OF ISLAND DISTRIBUTION OF 70 SPECIES FROM MAUI AND KAHOOLAWE—Continued

Species (common name)	Island distribution						
	Kauai	Oahu	Molokai	Lanai	Maui	Hawaii	NW Isles, Kahoolawe, Niihau
Hesperomannia arbuscula (NCN)		C			C		
Hibiscus brackenridgei (mao hau hele)	H	C	H	C	C	C	Ka (R)
Ischaemum byrone (Hilo ischaemum)	C	H	C		C	C	
Isodendrion pyrifolium (wahine noho kula).		H	H	H	H	C	Ni (H)
Kanaloa kahoolawensis (kohe malama malama o kanaloa).							Ka (C)
Lipochaeta kamolensis (nehe)					C		
Lysimachia lydgatei (NCN)		H			C		
Mariscus pennatiformis (NCN)	H	H			C	H	NW Isles (C)
Melicope adscendens (alani)					C		
Melicope balloui (alani)					C		
Melicope knudsenii (alani)	C				C		
Melicope mucronulata (alani)			C		C		
Melicope ovalis (alani)					C		
Neraudia sericea (NCN)			C	H	C		Ka (H)
Nototrichium humile (kului)		C			H		
Peucedanum sandwicense (makou)	C	C	C		C		
Phlegmariurus mannii (wawaeiole)	H				C	C	
Phyllostegia mannii (NCN)			C		H		
Phyllostegia mollis (NCN)		C	H		C		
Phyllostegia parviflora (NCN)		C			H	H	
Plantago princeps (laukahi kuahiwi)	C	C	C		C	H	
Platanthera holochila (NCN)	C	H	C		C		
Pteris lidgatei (NCN)		C	H		C		
Remya mauiensis (NCN)					C		
Sanicula purpurea (NCN)		C			C		
Schiedea haleakalensis (NCN)					C		
Schiedea hookeri (NCN)		C			H		
Schiedea nuttallii (NCN)	C	C	C		R		
Sesbania tomentosa (ohai)	C	C	C	H	C	C	Ni (H), Ka (C), NW Isles (C)
Solanum incompletum (popolo ku mai)	H		H	H	H	C	
Spermolepis hawaiiensis (NCN)	C	C	C	C	C	C	
Tetramolopium arenarium (NCN)					H	C	
Tetramolopium capillare (pamakani)					C		
Tetramolopium remyi (NCN)				C	H		
Vigna o-wahuensis (NCN)		H	C	C	C	C	Ni (H), Ka (C)
Zanthoxylum hawaiiense (ae)	C		C	H	C	C	

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

Eighteen of these species are endemic to the islands of Maui and Kahoolawe, while 42 species are reported from one or more other islands, as well as Maui and/or Kahoolawe. Each of these species is described in more detail below in the section, ''Discussion of Plant Taxa.'' Although we considered designating critical habitat on Maui and Kahoolawe for each of the 70 plant species, for the reasons described below, the final designation includes critical habitat for 60 of 70 plant species. Species that also occur on other islands may have critical habitat designated on other islands in previous or subsequent rulemakings.

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 above 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 ha (28,800 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 50 cm (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 Plant Taxa

Species Endemic to Maui or Kahoolawe

Argyroxiphium sandwicense ssp. *macrocephalum* (Ahinahina)

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 *A. sandwicense* ssp. *sandwicense* by the shape and ratio of the dimensions of the inflorescence (flowering part of plant), 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 (dry fruits) (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 to 50 years. 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). Numbers recorded flowering 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 of the U.S. Geological Survey—Biological Resources Division (USGS–BRD) to explore whether enhanced flowering is related to increased UV–B radiation caused by temporary reduction of stratospheric ozone. 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. *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* (naenae) have been observed. Primarily found within Haleakala Crater, especially on Puu o Pele and Puu o Maui cinder cones, these hybrid individuals can flower for several years before dying (Carr 1985; Loope and Crivellone 1986; Loope and Medeiros, in press; Service 1997; 57 FR 20772).

Currently, *Argyroxiphium sandwicense* ssp. *macrocephalum* occupies all of its historic range, a 1,000 ha (2,500 ac) area at 2,100 to 3,000 m (6,890 to 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. There are a total of 7 occurrences on Federal and privately owned land, with a total of 39,025 to 44,025 individual plants (Geographic Decision Systems International (GDSI) 2001; Hawaii Natural Heritage Program (HINHP) Database 2001; Loope and Crivellone 1986; Service 1997; TNCH 1998; 57 FR 20772).

The habitat of this species consists primarily of lava flows and otherwise barren, unstable slopes of recent (less than several thousand years old) volcanic cinder cones or in *Deschampsia nubigena* (hair grass) grasslands at elevations between 1,508 and 3,053 m (4,947 and 10,016 ft). Mean annual precipitation is approximately 75 to 250 cm (29.6 to 98.4 in). The substrate has almost no soil development and is subject to frequent formation of ice at night and extreme heating during cloudless days. This species is found in alpine dry shrubland with native species, including *Agrostis sandwicensis* (bent grass), *Dubautia menziesii, Leptecophylla tameiameiae* (pukiawe), *Silene struthioloides* (catchfly), *Tetramolopium humile* (NCN), or *Trisetum glomeratum* (pili uka) (Service 1997; 57 FR 20772; Robert Hobdy, Hawaii Division of Forestry and Wildlife (DOFAW), pers. comm., 2001).

The threats to this species are loss of pollinators caused by the nonnative Argentine ant (*Iridomyrmex humilis*) and yellow jackets (*Vespula pennsylvanica*); native seed-eating and herbivorous insects such as the tephritid fly (*Trupanea cratericola*); limited natural range, which makes it vulnerable to extinction due to catastrophic events, such as a natural disaster; competition from the nonnative plant species *Verbascum thapsus* (mullein); 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 (Service 1997; 57 FR 20772).

Clermontia samuelii (Oha wai)

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. *C. s.* ssp. *hanaensis* is differentiated from *C. s.* 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 (base of flower) (Lammers 1999; Service 2001).

Little is known about the life history of *Clermontia samuelii.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 2001; 64 FR 48307).

Historically, *Clermontia samuelii* has been reported from Haleakala and from Keanae Valley on the windward side to Manawainui on the leeward (southeastern) side of Haleakala. Currently, *C. samuelii* is known from Papanalahoa Point, Kuhiwa Valley, the ridge north of Palike Stream, Kawaipapa, and Mokulehua Gulch. There are 7 occurrences with 309 individual plants on State and Federal lands within Haleakala National Park, Hanawi Natural Area Reserve (NAR), Hana Forest Reserve, and within the East Maui Watershed Partnership (GDSI 2001, HINHP Database 2001, Medeiros and Loope 1989, Service 2001, Warshauer 1998, 64 FR 48307, R. Hobdy, DOFAW, *in litt.* 2000, Ken Wood, National Tropical Botanical Garden (NTBG), *in litt.* 2000).

Clermontia samuelii is found at elevations between 723 and 2,244 m (2,372 and 7,362 ft). *Clermontia samuelii* ssp. *hanaensis* is found in wet *Metrosideros polymorpha* (ohia) and *Metrosideros polymorpha-Dicranopteris linearis* (uluhe) forest containing one or more of the following associated native plant species: *Adenophorus tamariscinus* (wahine no mauna); *Broussaisia arguta* (kanawao); *Carex alligata* (NCN); *Cheirodendron trigynum* (olapa); *Cibotium* spp. (hapuu); *Diplazium sandwichianum* (hoio); *Dubautia* spp. (naenae); *Hedyotis hillebrandii* (manono); *Hedyotis terminalis* (manono); *Melicope clusiifolia* (kolokolo mokihana); *Melicope* spp. (alani); *Peperomia obovatilimba* (ala ala wai nui); *Psychotria mariniana* (kopiko);

Tetraplasandra oahuensis (ohe mauka); or *Vaccinium* spp. (ohelo). In addition, *Clermontia samuelii* ssp. *samuelii* is found in wet *Metrosideros polymorpha* and *M. polymorpha-Cheirodendron trigynum* forest containing one or more of the following native plant species: *Broussaisia arguta*; *Carex alligata*; *Cibotium* spp.; *Clermontia arborescens* ssp. *waihiae* (oha wai nui); *Clermontia* spp. (oha wai); *Diplazium sandwichianum*; *Dubautia* spp.; *Hedyotis hillebrandii*; *Hedyotis* spp. (NCN); *Melicope* spp.; *Rubus hawaiensis* (akala); or *Vaccinium* spp. (HINHP Database 2001; Service 2001; 64 FR 48307; R. Hobdy pers. comm., 2001; K. Wood, *in litt.* 2000).

Threats to *Clermontia samuelii* ssp. *hanaensis* include habitat degradation and destruction by feral pigs (*Sus scrofa*) and competition with nonnative plant species such as *Hedychium coronarium* (white ginger), *Hedychium gardnerianum* (kahili ginger), *Juncus* spp. (NCN), *Paspalum urvillei* (vasey grass), *Paspalum conjugatum* (Hilo grass), or *Tibouchina herbacea* (glorybush). In addition, two extremely invasive nonnative plant species, *Miconia calvescens* (velvet tree) and *Clidemia hirta* (Koster's curse), are found in nearby areas and may invade this habitat if not controlled. The habitat of *Clermontia 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 occurrence 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 occurrences must constantly be monitored to prevent further ingress. Competition with nonnative plant species such as *Holcus lanatus* (velvet grass) and *Juncus planifolius* (NCN) is also a major threat to this subspecies. In addition, rats (mainly black rats (*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 (Service 2001; 64 FR 48307; K. Wood, *in litt.* 2000).

Cyanea copelandii ssp. *haleakalaensis* (Haha)

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 *C. c.* ssp. *copelandii* 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 caused by the covering of hairs (Lammers 1999; Service 2001).

Little is known about the life history of *Cyanea copelandii* ssp. *haleakalaensis.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 2001; 64 FR 48307).

Historically, *Cyanea copelandii* ssp. *haleakalaensis* was reported from the windward side of Haleakala and from Waikamoi to Kipahulu Valley. Currently, this species is known from 5 occurrences with a total of 204 individuals on Federal and privately owned land within the East Maui Watershed Partnership in Haiku Uka, the ridge above Kuhiwa Valley, and Kipahulu Valley within Haleakala National Park and Hanawi Natural Area Reserve (NAR) (GDSI 2001; HINHP Database 2001; Lammers 1999; Service 2001; Warshauer 1998; 64 FR 48307).

Cyanea copelandii ssp. *haleakalaensis* is found on stream banks or wet scree (a sloping mass of rocks at the base of a cliff) slopes or in forest understory in montane wet or mesic forests dominated by *Acacia koa* (koa) and *Metrosideros polymorpha* at elevations between 616 and 1,411 m (2,021 and 4,630 ft). Associated species include *Broussaisia arguta, Cibotium* spp., *Hedyotis acuminata* (au), *Perrottetia sandwicensis* (olomea), and *Psychotria hawaiiensis* (kopiko ula) (HINHP Database 2001; R. Hobdy, pers. comm., 2001; Service 2001; 64 FR 48307).

The major threats to this species are habitat degradation and destruction by feral pigs; competition with several nonnative plant species; rats; slugs; human activities; and potential extinction caused by random environmental events due to small occurrence sizes (Service 2001; 64 FR 48307).

Cyanea glabra (Haha)

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; Service 2001).

Little is known about the life history of *Cyanea glabra.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 2001; 64 FR 48307).

Historically, *Cyanea glabra* has been reported from West Maui and on Haleakala, East Maui. Currently, this species is known from a single occurrence of 12 individual plants on privately owned land in Kauaula Valley (GDSI 2001; HINHP Database 2001; 64 FR 48307).

Cyanea glabra is found on soil and rock stream banks in wet lowland forests dominated by *Acacia koa* and *Metrosideros polymorpha,* at elevations between 413 and 1,572 m (1,355 and 5,156 ft). Associated native plants include *Boehmeria grandis* (akolea), *Cheirodendron trigynum, Christella cyatheoides* (kikawaio), *Cibotium* spp., *Clermontia kakeana* (ohai wai), *Coprosma* spp. (pilo), *Diplazium* spp. (NCN), *Dodonaea viscosa* (aalii), *Dubautia plantaginea* (naenae), *Perrottetia sandwicensis, Pipturus albidus* (mamaki), *Psychotria* spp. (kopiko), *Sadleria* spp. (amau), *Touchardia latifolia* (olona), and *Xylosma hawaiiense* (maua) (Service 2001; 64 FR 48307; Joel Lau, HINHP, pers. comm., 2001; HINHP Database 2001; R. Hobdy, pers. comm., 2001).

The threats to this species are slugs; habitat degradation and destruction by feral pigs; flooding; competition with several nonnative plant species; rats; the two-spotted leafhopper (*Saphonia rufofascia*); and extinction caused by random environmental events caused by the small number of individuals in the only remaining occurrence (Service 2001; 64 FR 48307).

Cyanea hamatiflora ssp. *hamatiflora (Haha)*

Cyanea hamatiflora ssp. *hamatiflora,* a short-lived perennial member of the bellflower family (Campanulaceae), is a palm-like tree with tan colored latex. This subspecies is differentiated from the other 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; Service 2001).

Little is known about the life history of *Cyanea hamatiflora* ssp. *hamatiflora.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 2001; 64 FR 48307).

Historically, *Cyanea hamatiflora* ssp. *hamatiflora* was known from the windward side of Haleakala, stretching from Puu o Kakae to Manawainui. Currently, this species is known from 9

occurrences with a total of 12 individuals within the East Maui Watershed Partnership in Honomanu, Wailuaiki, Kipahulu Valley, Koukouai, and Puu Ahulili, on Federal (Haleakala National Park) and privately owned lands (GDSI 2001; HINHP Database 2001; Service 2001; Warshauer 1998; 64 FR 48307).

Typical habitat for this species is montane wet forest dominated by *Metrosideros polymorpha,* with a *Cibotium* spp. and/or native shrub understory, or closed *Acacia koa-M. polymorpha* wet forest, containing one or more of the following associated native plant species: *Athyrium microphyllum* (akolea), *Broussaisia arguta*, *Cheirodendron trigynum*, *Cyanea aculeatiflora* (haha), *Cyanea kunthiana* (haha), *Dicranopteris linearis*, *Diplazium sandwichianum, Melicope* spp., *Myrsine* spp. (kolea), or *Vaccinium* spp.; and at elevations between 767 and 1,553 m (2,515 and 5,095 ft) (HINHP Database 2001; R. Hobdy, pers. comm., 2001; Service 2001; 64 FR 48307).

The threats to this species are habitat degradation and destruction by feral pigs; landslides; competition with the nonnative plant *Ageratina adenophora* (Maui pamakani); rats; and slugs (Service 2001; 64 FR 48307).

Cyanea mceldowneyi (Haha)

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 (4 cm (1.6 in)), white corollas; and leaf blade size and shape (Lammers 1999; Service 2001).

Little is known about the life history of *Cyanea mceldowneyi.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1997; 57 FR 20772).

Historically, *Cyanea mceldowneyi* was known from rainforest west of Waikamoi to Honomanu on northwestern Haleakala. Currently, this species is known from 11 occurrences with a total of 36 individuals on State (Makawao Forest Reserve and Hanawi NAR) and privately owned lands within the East Maui Watershed Partnership at Kahakapao Gulch, Opana Gulch, Waikamoi, Puohokamoa, Makapipi, and the flats above Kuhiwa Valley (GDSI 2001; HINHP Database 2001; Lammers 1999; Service 1997; Warshauer 1998; 57 FR 20772).

The habitat of this species is montane wet and mesic forest with mixed *Metrosideros polymorpha-Acacia koa* containing one or more of the following associated native plant species: *Broussaisia arguta*, *Cheirodendron trigynum, Cibotium* spp., *Clermontia arborescens*, Cyrtandra spp. (haiwale), *Dicranopteris linearis*, *Diplazium sandwichianum*, *Hedyotis* spp., or *Melicope clusiifolia*, at elevations between 779 and 1,357 m (2,555 and 4,453 ft) (R. Hobdy, pers. comm., 2001, Service 1997, 57 FR 20772).

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

Dubautia plantaginea ssp. *humilis* (Naenae)

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 strigillose (bulbous-based hairs, all pointing in the same direction) stems. This species differs from other Hawaiian members of the genus by the number of veins in the leaves and by the close resemblance of the leaves to the genus *Plantago*. The subspecies *humilis* differs from the other two subspecies (*D. plantaginea* ssp. *magnifolia* and *D. plantaginea* ssp. *plantaginea*) by having fewer heads per inflorescence, but more florets per head (Carr 1985; Carr 1999b; Service 2001).

Little is known about the life history of *Dubautia plantaginea* ssp. *humilis*. Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 2001; 64 FR 48307).

Dubautia plantaginea ssp. *humilis* has only been reported from Iao Valley on West Maui. The two occurrences with 60 to 65 individuals in total are on privately owned land (GDSI 2001; HINHP Database 2001; Service 2001; 64 FR 48307).

The typical habitat of the species is wet, barren, steep, rocky, wind-blown cliffs containing one or more of the following associated native plant species: *Bidens* spp. (kookoolau), *Carex* spp. (NCN), *Eragrostis variabilis* (kawelu), *Hedyotis formosa* (NCN), *Lysimachia remyi* (NCN), *Metrosideros polymorpha*, *Pipturus albidus*, *Plantago princeps* (laukahi kuahiwi), or *Pritchardia* spp. (loulu), at elevations between 266 and 1,593 m (873 and 5,226 ft) (HINHP Database 2001; Service 2001; 64 FR 48307; R. Hobdy, pers. comm., 2001).

Threats to *Dubautia plantaginea* ssp. *humilis* include landslides and competition from nonnative plant species. Random environmental events, such as landslides, are a threat because of the limited number of individuals and occurrences and their narrow distribution (Service 2001; 64 FR 48307).

Geranium arboreum (Nohoanu)

Geranium arboreum, a long-lived perennial member of the geranium family (Geraniaceae), 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 species* 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. Native honeycreepers appear to be a major pollination vector. *Geranium 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. Native honeycreepers are reasonably abundant in both areas. Little else is known about the life history of *Geranium arboreum.* Flowering cycles, other pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Funk 1982, 1988; Service 1997; 57 FR 20772).

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. Currently, there are 12 occurrences totaling 158 individuals, within the East Maui Watershed Partnership on State (Kula and Kahikinui Forest Reserves), private, and federally owned or leased (Haleakala National Park) lands. These occurrences are found in Kahua, Kanahau, Waiohuli, Kaipoioi Gulch, Hapapa Gulch, Keauaiwi Gulch, Kalialinui, and south of Puu Luau and east of Puu Nianiau (GDSI 2001; HINHP Database 2001; Service 1997; Warshauer 1998; 57 FR 20772).

Geranium arboreum grows in steep, damp, and shaded narrow canyons and gulches, steep banks, and intermittent streams in *Sophora chrysophylla* (mamane) subalpine dry shrubland or *Metrosideros polymorpha* montane forest containing one or more of the

following associated native plant species: *Dryopteris wallichiana* (io nui); *Dodonaea viscosa; Leptecophylla tameiameiae*; *Rubus hawaiiensis*; or *Vaccinium reticulatum* (ohelo ai), at elevations between 1,451 and 2,184 m (4,760 and 7,164 ft) (R. Hobdy, pers. comm., 2001; Service 1997; 57 FR 20772).

The greatest immediate threat to the survival of this species is encroachment and competition from naturalized, nonnative 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 nonnative pine trees, which at certain times of the year completely covers the stigmas of the geraniums, precluding any fertilization by its own pollen. The small number of individual plants increases the potential for extinction from random environmental events, and the limited gene pool may depress reproductive vigor (Funk 1982, 1988; Service 1997; 57 FR 20772).

Geranium multiflorum (Nohoanu)

Geranium multiflorum, a long-lived member of the geranium family (Geraniaceae), is a perennial many-branched shrub 1 to 3 m (3 to 10 ft) tall. Flowers are in clusters of 25 to 50 and have 5 white petals that are 10 to 15 millimeters (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 (Wagner *et al.* 1999).

Little is known about the life history of *Geranium multiflorum.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1997; 57 FR 20772).

Historically, *Geranium multiflorum* was known from Ukulele, Waieleele, and Waianapanapa on East Maui. This species is now known from Federal (Haleakala National Park), State (Hanawi NAR and Koolau Forest Reserve), and private lands within the East Maui Watershed Partnership in Haiku Ula, Kalialinui, Koolau Gap, between East Waiuaki and Kopiliula Streams, near Puu Alaea along Kalapawili Ridge, Kipahulu Valley, Waiakekeehia, and Haleakala Crater. The 13 known occurrences extend over a distance of about 10.5 by 5.5 km (6.5 by 3.5 mi). Due to the inaccessibility of the occurrences, and the difficulty in determining the number of individuals (caused by 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 (GDSI 2001; HINHP Database 2001; R. Hobdy, pers. comm., 2001; Service 1997; Warshauer 1998; 57 FR 20772).

Geranium multiflorum is found in wet or mesic *Metrosideros polymorpha* montane forest or alpine mesic forest, *Leptecophylla tameiameiae* 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* (pilo); *Dryopteris glabra* (hohui); *Dryopteris wallichiana; Hedyotis* spp.; *Rubus hawaiiensis; Sadleria cyatheoides;* or *Vaccinium* spp. (amau), at elevations between 1,499 and 2,710 m (4,918 and 8,890 ft) (HINHP Database 2001; Service 1997; Wagner *et al.* 1999; 57 FR 20772).

The major threat to *Geranium multiflorum* is competition with encroaching nonnative plant species, particularly *Rubus argutus* (prickly Florida blackberry). A potential threat is habitat destruction by feral pigs and goats in unfenced areas (Service 1997; 57 FR 20772).

Kanaloa kahoolawensis (Kohe malama malama o kanaloa)

Kanaloa kahoolawensis, a short-lived perennial 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. No other species of legume in Hawaii bears any resemblance to this species, which is why it is the only one in this genus (Lorence and Wood 1994; Service 2001).

Little is known about the life history of *Kanaloa kahoolawensis.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 2001; 64 FR 48307).

Kanaloa kahoolawensis was unknown to science until its discovery by Steve Perlman and Ken Wood of NTBG in 1992 on a steep rocky spire on the coast of Kahoolawe. The only known location of *K. kahoolawensis* is this rocky stack on the southern coast of Kahoolawe, in an area which is owned by the State of Hawaii. While there are no previous records of the plant, pollen core studies on Oahu revealed a legume pollen that could not be identified but is most likely this species. The pollen cores indicate that this previously unidentified species was a codominant with *Dodonaea viscosa* and *Pritchardia* spp. from before 1210 B.C. to 1565 A.D., at which point *K. kahoolawensis* disappeared from the pollen record and *D. viscosa* and *Pritchardia* spp. declined dramatically. Only one occurrence with two living individuals is known (Athens *et al.* 1992; Athens and Ward 1993; Lorence and Wood 1994; Service 2001; 64 FR 48307; Paul Higashino, Kahoolawe Island Reserve Commission (KIRC), pers. comm., 2000).

The only known habitat is steep rocky talus slopes in mixed coastal shrubland at elevations between 0 and 305 m (0 and 1,000 ft) and containing one or more of the following associated native plant species: *Bidens mauiensis* (kookoolau); *Capparis sandwichiana* (maiapilo); *Melanthera lavarum* (nehe); *Portulaca molokiniensis* (ihi); *Senna gaudichaudii* (kolomona); or *Sida fallax* (ilima) (Service 2001; 64 FR 48307; R. Hobdy, pers. comm., 2001).

The major threats to *Kanaloa kahoolawensis* are landslides and competition with the nonnative plant species *Emilia fosbergii* (pualele) and *Nicotiana glauca* (tree tobacco). Goats played a major role in the destruction of vegetation on Kahoolawe before they were removed, and *K. kahoolawensis* probably survived only because the rocky stack is almost completely separated from the island and inaccessible to goats. Rats are a potential threat to *K. kahoolawensis,* because the species has seeds similar in appearance and presentation to the seeds of the federally endangered *Caesalpinia kavaiensis* (uhiuhi), which are eaten by rats. Rats may have been the cause of the decline of this species over 400 years ago. Trampling and habitat degradation from introduced cats and native seabirds are also potential threats. Random environmental events and reduced reproductive vigor are also threats to this species, because only two individuals are known (Cuddihy and Stone 1990; Lorence and Wood 1994; Service 2001; 64 FR 48307; P. Higashino, pers. comm., 2000).

Lipochaeta kamolensis (Nehe)

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 to May. Plants are deciduous and appear to be metabolically inactive during the dry season. Little else is known about the life history of *L. kamolensis.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are otherwise unknown (Service 1997; 57 FR 20772).

Historically, *Lipochaeta kamolensis* was known from Kamole Gulch, west of Kepuni Gulch, and 7.2 km (11.8 mi) southeast of Ulupalakua Ranch Office. This species still occurs in Kamole Gulch, on State-owned (Department of Hawaiian Home Lands (DHHL)) land. The only known occurrence, which extends over an area of about 40 ha (100 ac), is estimated to contain fewer than 500 individuals (GDSI 2001; HINHP Database 2001; Service 1997; Wagner *et al.* 1999; 57 FR 20772; K. Wood, *in litt.* 1999).

Lipochaeta kamolensis typically grows in gulches or on gentle slopes outside gulches in dry shrubland at elevations between 40 and 602 m (132 and 1,974 ft) and containing one or more of the following associated native plant species: *Dodonaea viscosa; Ipomoea indica* (koali awa); or *Plumbago zeylanica* (iliee) (Service 1997; Wagner *et al.* 1999; 57 FR 20772; R. Hobdy, pers. comm., 2001; K. Wood, *in litt. 1999).*

The major threats to *Lipochaeta kamolensis* are habitat destruction, predation by cattle and goats, competition with nonnative plants such as *Lantana camara* (lantana), fire, and the one occurrence being subject to extinction by random environmental events (Service 1997; 57 FR 20772).

Melicope adscendens (Alani)

Melicope adscendens, a long-lived perennial of the rue family (Rutaceae), is a sprawling shrub with long, slender branches covered with gray hairs when young, which become hairless when older. *Melicope adscendens* is distinguished from other species of the genus by its growth habit, the distinct follicles (chambers) 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. Little else is known about the life history of *M. adscendens.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1997; 59 FR 62346).

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 16 occurrences on State (Kanaio NAR) and privately owned lands at Puu Ouli and on the border of the Hana and Makawao Districts (GDSI 2001; HINHP Database 2001; Service 1997; 59 FR 62346).

This species typically grows on aa lava (a particular type of lava flow with very sharp edges) with pockets of soil in *Nestegis sandwicensis* (olopua)-*Pleomele auwahiensis* (hala pepe)-*Dodonaea viscosa* lowland mesic forest or open dry forest containing one or more of the following associated native plant species: *Alphitonia ponderosa* (kauila); *Chamaesyce celastroides* var. *lorifolia* (akoko); *Leptecophylla tameiameiae; Osteomeles anthyllidifolia* (ulei); *Pouteria sandwicensis* (alaa); *Santalum ellipticum* (iliahialoe); or *Xylosma hawaiiense* (maua) at elevations between 761 and 1,209 m (2,497 and 3,967 ft) (HINHP Database 2001; Service 1997; 59 FR 62346; R. Hobdy, pers. comm., 2001; K. Wood, *in litt.* 1999).

Major threats are habitat damage and trampling by cattle; competition with nonnative plant species, including *Bocconia frutescens* (NCN), *Lantana camara,* and *Pennisetum clandestinum* (kikuyu grass); and reduced reproductive vigor or extinction from random environmental events caused by 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 (*Xylosandrus compactus*), fire, and ranch activities (HINHP Database 2001; Service 1997; 59 FR 62346).

Melicope balloui (Alani)

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

Little is known about the life history of *Melicope balloui.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1997; 59 FR 62346).

Melicope balloui has been found only on the northern and southeastern slopes of Haleakala. There are 3 known occurrences with a total of approximately 50 individuals on private and federally owned (Haleakala National Park) lands within the East Maui Watershed Partnership at Puu O Kakae and Palikea Stream (GDSI 2001; HINHP Database 2001; Service 1997; 59 FR 62346; K. Wood, *in litt.* 1999).

Melicope balloui typically grows in mesic to wet forest between 781 and 1,596 m (2,561 and 5,267 ft) in elevation and containing one or more of the following associated native plant species: *Acacia koa; Cibotium chamissoi* (hapuu); *Cibotium glaucum* (hapuu); *Diplazium sandwichianum; Melicope clusiifolia; Metrosideros polymorpha;* or *Sadleria pallida* (amau) (HINHP Database 2001; Service 1997; 59 FR 62346; J. Lau, Hawaii Natural Heritage Program, pers. comm., 2001).

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 caused by the small number of existing occurrences and individuals. Potential threats include competition with nonnative plant species such as *Clidemia hirta, Paspalum conjugatum, Paspalum urvillei,* and *Psidium cattleianum* (strawberry guava); susceptibility to black twig borer; and predation by rats (HINHP Database 2001; Service 1997; 59 FR 62346).

Melicope ovalis (Alani)

Melicope ovalis, a long-lived perennial of the rue 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. Bruised foliage has an anise odor similar to that of *M. anisata* (mokihana). *Melicope 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 (leaf stems) (Stone *et al.* 1999).

Little is known about the life history of *Melicope ovalis.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1997; 59 FR 62346).

Melicope ovalis has been found only on the eastern and southeastern slopes of Haleakala. There are two occurrences with approximately 200 individuals,

found on federally owned land along Palikea Stream in Haleakala National Park within the East Maui Watershed Partnership (GDSI 2001; HINHP Database 2001; Service 1997; 59 FR 62346; K. Wood, *in litt.* 1999).

This species typically grows in *Acacia koa* and *Metrosideros polymorpha*-dominated montane wet forests along streams at elevations between 753 and 1,537 m (2,469 and 5,042 ft). Associated plant species include: *Broussaisia arguta; Cheirodendron trigynum; Dicranopteris linearis; Dubautia plantaginea; Hedyotis hillebrandii; Labordia hedyosmifolia* (kamakahala); *Machaerina angustifolia* (uki); *Perrottetia sandwicensis;* or *Wikstroemia oahuensis* (akia) (HINHP Database 2001; Service 1997; 59 FR 62346; R. Hobdy, pers. comm., 2001).

Major threats to the only known population are habitat degradation and damage to plants by feral pigs and reduced reproductive vigor and/or extinction caused by random environmental events. Competition with introduced plants such as *Clidemia hirta, Paspalum conjugatum, Psidium cattleianum* and *Rubus rosifolius* (thimbleberry); seed predation by rats; and susceptibility to black twig borer are also threats to this species. Habitat degradation and damage to plants by feral goats and axis deer are potential threats if the integrity of the fence currently surrounding the occurrence is compromised (HINHP Database 2001; Service 1997; 59 FR 62346; K. Wood, *in litt.* 1999).

Remya mauiensis (NCN)

Remya mauiensis is a short-lived perennial member of the aster family (Asteraceae). The genus *Remya* is endemic to the Hawaiian Islands. This species is a small perennial shrub, about 90 cm (3 ft) tall, with many slender, sprawling, or scandent (climbing) to weakly erect branches. It is distinguished from the other two members of the genus by its hairy stems and foliage, leaf shape, and length of the petiole (Wagner *et al.* 1999).

Little is known about the life history of *Remya mauiensis.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1997; 56 FR 1450).

Remya mauiensis was collected twice on West Maui by William Hillebrand 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 five occurrences on State-owned land within the West Maui Mountains Watershed Partnership at Paupau, Kokuula, Kanaulaiki, and Maunawainui Gulch in the Panaewa section of the West Maui NAR, the West Maui Forest Reserve, and the Manawainui Plant Sanctuary. 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; however, there is an estimated total of 21 individuals (GDSI 2001; HINHP Database 2001; Service 1997; 56 FR 1450).

Remya mauiensis grows chiefly on steep, north or northeast-facing slopes in mixed mesophytic forests or *Metrosideros polymorpha* montane wet forests containing one or more of the following associated native species: *Alyxia oliviformis* (maile); *Diospyros sandwicensis* (lama); *Diplazium sandwichianum; Dodonaea viscosa; Leptecophylla tameiameiae; Lysimachia remyi; Melicope* spp.; *Microlepia strigosa* (palapalai); *Myrsine lessertiana* (kolea lau nui); *Nestegis sandwicensis; Pleomele auwahiensis; Psychotria mariniana; Wikstroemia* spp. (akia); or *Xylosma hawaiiense* at elevations between 400 and 1,228 m (1,312 and 4,029 ft) (HINHP Database 2001; Service 1997; 56 FR 1450; R. Hobdy, pers. comm., 2001).

This species is threatened by extinction caused by random catastrophic environmental events by virtue of the extremely small size of the occurrences coupled with their limited distribution. The limited gene pool may depress reproductive vigor, or a single environmental disturbance could destroy a significant percentage of the known individuals. However, the primary threat to this species is the loss and degradation of its habitat caused by the introduction of nonnative plants, such as *Adiantum hispidulum* (rough maidenhair fern), Rubus rosifolius, *Schinus terebinthifolius* (Christmas berry), or *Tibouchina herbacea;* human activities; and feral goats and pigs (Service 1997; 56 FR 1450).

Schiedea haleakalensis (NCN)

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 in clusters at the ends of the branches. 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 bisexual flowers) and so likely requires 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. Little else is known about the life history of *S. haleakalensis.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1997; 57 FR 20772).

Due to the lack of early collections or sightings, the historical range of *Schiedea haleakalensis* is unknown. This species is known only from Leleiwi Pali and Kaupo Gap in Haleakala National Park within the East Maui Watershed Partnership. The two occurrences are estimated to contain a total of 100 to 200 individuals, which together extend over a total area of 11 ha (28 ac) (GDSI 2001; HINHP Database 2001; Service 1997; 57 FR 20772).

Schiedea haleakalensis typically grows in rock cracks on sheer cliffs adjacent to barren lava and subalpine shrublands and grasslands with cinder, weathered volcanic ash, or in bare lava substrate with little or no soil development and periodic freezing temperatures, and containing one or more of the following associated native plant species: *Artemisia mauiensis* (hinahina), *Bidens micrantha* (kookoolau), *Dubautia menziesii, Leptecophylla tameiameiae, Vaccinium reticulatum,* or *Viola chamissoniana* (pamakani) at elevations between 1,678 and 2,434 m (5,505 and 7,986 ft) (HINHP Database 2001, Service 1997, 57 FR 20772 R. Hobdy, pers. comm., 2001).

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

Tetramolopium capillare (Pamakani)

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. *Tetramolopium 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).

Little is known about the life history of *Tetramolopium capillare.* Flowering

cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Lowrey 1999).

Historically, *Tetramolopium capillare* is known from Lahaina Luna to Wailuku on West Maui. Currently, 5 known occurrences with a total of 166 individuals are known from State (West Maui Forest Reserve) and privately owned lands within the West Maui Mountains Watershed Partnership, south of Kanaha Stream, Kauaula, Ulaula, and Koia (GDSI 2001; Lowrey 1999; Service 1997; 59 FR 49860).

Tetramolopium capillare typically grows on rocky substrates in *Heteropogon contortus* (pili grass) lowland dry forest containing *Dodonaea viscosa* or *Myoporum sandwicense* (naio); or in *Metrosideros polymorpha-Leptecophylla tameiameiae montane mesic* or wet shrubland and wet cliff faces containing one or more of the following associated plant species: *Dodonaea viscosa, Leptecophylla tameiameiaem* or *Metrosideros polymorpha,* at elevations between 131 and 1,432 m (430 and 4,698 ft) (Service 1997; 59 FR 49860; R. Hobdy, pers. comm., 2001).

The major threats to *Tetramolopium capillare* are fires; competition from nonnative plant species, particularly *Lantana camara, Leucaena leucocephala* (koa haole), or *Melinus repens* (natal redtop); and reduced reproductive vigor and/or extinction from random environmental events caused by the small number of existing occurrences and individuals (Service 1997; 59 FR 49860).

Multi-Island Species

Acaena exigua (Liliwai)

Acaena exigua is a small perennial rosette herb in the rose family (Rosaceae) with narrow, fern-like, divided leaves. It is easily hidden among the other low, tufted bog plants with which it grows. It is distinguished from other Hawaiian rose family members by its lack of petals and by the urn-shaped, constricted base of the flower, that encloses the fruit (Wagner *et al.* 1999).

Little is known about the life history of *Acaena exigua.* Its flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1997; 57 FR 20772).

Historically, *Acaena exigua* was known from Puu Kukui on West Maui and from Mount Waialeale on Kauai. On Maui, *A. exigua* was last seen by Hank Oppenheimer and Steve Perlman in 1999 within the Puu Kukui Watershed Management Area. It has not been seen in the wild since March 2000 (Hank Oppenheimer, Maui Pineapple Company Limited, pers. comm., 2001; Service 1997; 57 FR 20772).

Acaena exigua is known only from montane bogs characterized by a thick peat substrate overlying an impervious clay substrate, with hummocks of sedges and grasses, stunted trees, and shrubs at elevations between 1,178 and 1,764 m (3,865 and 5,787 ft). Associated native species include the sedges and grasses *Carex montis-eeke* (NCN), *Deschampsia nubigena, Dichanthelium cynodon* (NCN), *Dichanthelium hillebrandianum* (NCN), *Dichanthelium isachnoides* (NCN), *Oreobolus furcatus (NCN),* or *Rhynchospora chinensis* (kuolohia), and the shrubs *Lagenifera maviensis* (howaiaulu), *Metrosideros polymorpha, Myrsine* spp., *Vaccinium* spp., or *Viola maviensis* (pamakani) (R. Hobdy, pers. comm., 2001; Service 1997; 57 FR 20772).

The reason for the disappearance of this species is not known. The main current threats to *Acaena exigua,* if it exists, are believed to include small occurrence size; human impacts (collecting and site degradation); consumption of vegetative or floral parts by nonnative slugs and rats; predation and habitat disturbance by feral pigs; and competition with nonnative plant species (Service 1997; 57 FR 20772).

Adenophorus periens (Pendent kihi fern)

Adenophorus periens, a member of the grammitis family (Grammitidaceae) and a short-lived perennial, is a small, pendent, epiphytic (not rooted in the ground) fern. This species differs from others in this endemic Hawaiian genus by having hairs along the pinna (leaflet) margins, by the pinnae being at right angles to the midrib axis, by the placement of the sori (spore-bearing structures) on the pinnae, and by the degree of dissection of each pinna (Linney 1989).

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

Historically, *Adenophorus periens* was reported from Kauai, Oahu, Lanai, Maui, and the island of Hawaii. Currently, it is known from Kauai, Molokai, and Hawaii. On Maui, it has not been seen in the wild since 1929 (GDSI 2001; HINHP Database 2001; Service 1999; 59 FR 56333).

Nothing is known of the preferred habitat of or native plant species associated with *Adenophorus periens* on the island of Maui (Service 1999; 59 FR 56333).

Nothing is known of the threats to *Adenophorus periens* on the island of Maui (Service 1999; 59 FR 56333).

Alectryon macrococcus (Mahoe)

Alectryon macrococcus, a long-lived perennial member of the soapberry family (Sapindaceae), consists of two varieties, *macrococcus* and *auwahiensis,* both trees with reddish-brown branches and leaves with one to five pairs of sometimes asymmetrical egg-shaped leaflets. The underside of the leaf has dense brown hairs, persistent in A. macrococcus var. auwahiensis but only on leaves of young *A. macrococcus* var. *macrococcus.* 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 (Service 1997; Wagner *et al.* 1999; 57 FR 20772).

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 (Service 1997; 57 FR 20772).

Historically and currently, *Alectryon macrococcus* var. *macrococcus is* known from Kauai, Oahu, Molokai, and Maui. On Maui, 10 occurrences with a total of 10 individuals are found along the Honokowai Ditch Trail, Launiupoko Valley, and Iao Valley on privately owned land within the West Maui Mountains Watershed Partnership. Currently, *A. macrococcus* var. *auwahiensis* is known from 3 occurrences with 22 individuals on leeward East Maui in Auwahi in the Hana District and on the ridge east of Pahihi Gulch on private and State-owned (Kahikinui Forest Reserve) lands (GDSI 2001; HINHP Database 2001;

Medeiros *et al.* 1986; Service 1997; 57 FR 20772).

The habitat of *Alectryon macrococcus* var. *macrococcus* on Maui is mesic forests with *Antidesma platyphyllum* (hame), *Antidesma pulvinatum* (hame), *Bobea sandwicensis* (ahakea), *Nestegis sandwicensis, Pittosporum confertiflorum* (hoawa), *Pittosporum glabrum* (hoawa), *Pouteria sandwicensis,* or *Xylosma* spp. (maua) at elevations between 1,017 and 3,562 m (1,168 and 3,337 ft). The habitat of *Alectryon macrococcus* var. *auwahiensis* is mesic to wetter mesic and upper dryland forest containing one or more of the following associated native plant species: *Alphitonia ponderosa; Diospyros sandwicensis; Dodonaea viscosa; Osteomeles anthyllidifolia; Pleomele auwahiensis; Pouteria sandwicensis; Santalum ellipticum; Streblus pendulinus* (aiai); or *Xylosma hawaiiense,* at elevations between 333 and 1,210 m (1,092 and 3,969 ft) (HINHP Database 2001; Service 1997; 57 FR 20772; R. Hobdy, pers. comm., 2001; K. Wood, *in litt.* 1999).

The threats to *Alectryon macrococcus* var. *macrococcus* on Maui include feral goats and pigs; nonnative plant species, such as *Melinus minutiflora* (molasses grass), *Pennisetum clandestinum, Psidium cattleianum,* or *Schinus terebinthifolius;* 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 caused by the very small remaining number of individuals and their limited distribution, the likelihood that 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, deer, and escaped cattle; seed predation by insects (probably *Prays* cf. *fulvocanella*); nonnative plant species; loss of pollinators; depressed reproductive vigor; and caused by the very small remaining number of individuals and their limited distribution, the likelihood that a single natural or human-caused environmental disturbance could be catastrophic (Service 1997; 57 FR 20772).

Asplenium fragile var. *insulare* (NCN)

Asplenium fragile var. *insulare,* a short-lived perennial member of the spleenwort family (Aspleniaceae), is a fern with a short sub-erect stem with a dull gray or brown main axis with two greenish ridges. This species is most similar to *A. macraei.* The two can be distinguished by the size and shape of the pinnae and the number of sori (spore-bearing structures) per pinna (Wagner and Wagner 1992).

Little life history information is available for *Asplenium fragile* var. *insulare.* Reproductive cycles, longevity, specific environmental requirements, and limiting factors are largely unknown. Researchers have collected information on species composition, extent of cover, and age-class structure in six sub-populations at Pohakuloa Training Area on the island of Hawaii in order to describe the populations. No gametophytes (gamete-producing life stage) were found, and the age-class structure of the sub-populations sampled was determined to be 100 percent reproductive adults because all the sporophytes (spore-producing life stage) had sori on some fronds (Service 1998a; 59 FR 49025).

Asplenium fragile var. *insulare* was known historically and currently from East Maui and the island of Hawaii. Currently, on Maui there are two occurrences with 18 individuals found in Kalialinui within the East Maui Watershed Partnership on private and federally (Haleakala National Park) owned lands (GDSI 2001; Service 1998a; 59 FR 49025).

On Maui, *Asplenium fragile* var. *insulare* is found in streamside hollows and grottos in gulches that occur in mesic to dry subalpine shrubland dominated by *Leptecophylla tameiameiae* and *Sadleria cyatheoides,* with scattered *Metrosideros polymorpha,* between 1,682 and 2,407 m (5,518 and 7,896 ft). Associated native plant species include *Dryopteris wallichiana* and *Grammitis hookeri* (makue lau lii) (Service 1998a; 59 FR 49025; R. Hobdy, pers. comm., 2001).

The primary threat to *Asplenium fragile* var. *insulare* on the island of Maui is the risk of extinction caused by random naturally occurring events due to the small number of existing individuals (Service 1998a; Shaw 1992; 59 FR 49025).

Bidens micrantha ssp. *kalealaha* (Kookoolau)

Bidens micrantha ssp. *kalealaha,* a short-lived member of the aster family (Asteraceae), is an erect perennial herb. This subspecies can be distinguished 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 (Ganders and Nagata 1999; 57 FR 20772).

Bidens micrantha is known to hybridize with other native *Bidens,* such as *B. mauiensis* and *B. menziesii,* and possibly *B. conjuncta.* Little else is known about the life history of *B. micrantha* ssp. *kalealaha.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, and specific environmental requirements are unknown (Ganders and Nagata 1999; Service 1997; 57 FR 20772).

Historically, *Bidens micrantha* ssp. *kalealaha* was known from Lanai, the south slope of Haleakala on East Maui, and from one location on West Maui. Currently, this species remains only on East Maui in Kahua, Nakula, and Haleakala Crater and Kaupo Gap, on State (Kahikinui Forest Reserve) and Federal (Haleakala National Park) lands within the East Maui Watershed Partnership. There are a total of 4 occurrences with less than a total of 2,000 individuals (Ganders and Nagata 1999; GDSI 2001; HINHP Database 2001; Service 1997; 57 FR 20772).

The habitat of *Bidens micrantha* ssp. *kalealaha* on Maui is blocky lava flows with little or no soil development; deep pit craters; sheer rock walls in open canopy *Metrosideros polymorpha-Acacia koa* forest; montane shrubland; *Sophora chrysophylla* forests or cliff faces, and containing one or more of the following associated native plant species: *Coprosma montana* (pilo); *Dodonaea viscosa; Dubautia platyphylla* (naenae); *Leptecophylla tameiameiae; Santalum haleakalae* (iliahi); or *Vaccinium reticulatum.* In addition, the habitat of *Bidens micrantha* ssp. *kalealaha* is at elevations between 1,317 and 2,565 m (4,321 and 8,414 ft) (Ganders and Nagata 1999; HINHP Database 2001; Service 1997; 57 FR 20772; R. Hobdy, pers. comm., 2001).

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 (Service 1997; 57 FR 20772).

Bonamia menziesii (NCN)

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 *Bonamia menziesii.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and

limiting factors are unknown (Service 1999; 59 FR 56333).

Historically, *Bonamia menziesii* was known from Kauai, Oahu, Molokai, one location on West Maui, and the island of Hawaii. Currently, this species is known from Kauai, Oahu, Lanai, Maui, and Hawaii. On Maui, there are six occurrences containing a total of eight individuals on State (Kanaio NAR) and privately owned lands within the West Maui Mountains Watershed Partnership at Honokawai, Keokea, Haunauhane, and Kanaio (GDSI 2001; HINHP Database 2001; Service 1999; 59 FR 56333; K. Wood, *in litt.* 1999).

Bonamia menziesii on Maui is found on a lava in mixed open dry forest, *Erythrina sandwicensis* (wiliwili) lowland dry forest, or in mesic mixed *Metrosideros polymorpha* forest containing one or more of the following associated native plant species: *Acacia koaia* (koaia); *Achyranthes splendens* (Maui hinahina ewa); *Alphitonia ponderosa; Alyxia oliviformis; Diospyros sandwicensis; Dodonaea viscosa; Lipochaeta rockii* (nehe); *Myoporum sandwicense; Nestegis sandwicensis; Nothocestrum latifolium* (aiea); *Nototrichium* spp. (kului); *Pleomele auwahiensis; Pouteria sandwicensis; Osteomeles anthyllidifolia; Reynoldsia sandwicensis* (ohe); *Santalum ellipticum; Sicyos* spp. (anunu); *Sida fallax;* or *Xylosma hawaiiense,* at elevations between 184 and 906 m (604 and 2,971 ft) (HINHP Database 2001; Service 1999; 59 FR 56333; R. Hobdy, pers. comm., 2001; 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 nonnative plant species, particularly *Bocconia frutescens* or *Lantana camara;* and an nonnative beetle (*Physomerus grossipes*) (Service 1999; 59 FR 56333).

Brighamia rockii (Pua ala)

Brighamia rockii, a long-lived perennial member of the bellflower family (Campanulaceae), grows as an unbranched stem-succulent with a thickened stem that tapers from the base. This species is a member of a unique endemic Hawaiian genus with only one other species, found on Kauai, from which it differs by the color of its petals, its longer calyx (fused sepals) lobes, and its shorter flower stalks (Lammers 1999).

Observations of *Brighamia rockii* have provided the following information: The reproductive system is protandrous, meaning male flower parts are produced before female parts, in this case, separated by several days; only five percent of the flowers produce pollen; very few fruits are produced per inflorescence; there are 20 to 60 seeds per capsule; and plants in cultivation have been known to flower at nine months of age. This species has been observed in flower during August. Little else is known about the life history of *B. rockii.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (HINHP Database 2001; Service 1996b; 57 FR 46325).

Historically, *Brighamia rockii* ranged along the northern coast of East Molokai and may possibly have grown on Lanai and Maui. Currently, it is only extant on Molokai (HINHP Database 2001; Lammers 1999; Service 1996b; 57 FR 46325; K. Wood, *in litt.* 2000).

Brighamia rockii occurs in rock crevices on steep sea cliffs, often within the spray zone, in coastal dry to mesic forests and shrublands between 0 and 195 m (0 and 640 ft). Associated plant species include *Diospyros sandwicensis, Psydrax odorata* (alahee), *Osteomeles anthyllidifolia,* and *Scaevola taccada* (naupaka kahakai) (Service 1996b; 57 FR 46325; J. Lau, pers. comm., 2001).

Nothing is known of the threats to *Brighamia rockii* on the island of Maui (Service 1996b; 57 FR 46325).

Cenchrus agrimonioides (Kamanomano, =sandbur, agrimony)

Cenchrus agrimonioides is a short-lived perennial member of the grass family (Poaceae) with leaf blades that 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 *Cenchrus agrimonioides.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown. This species has been observed to produce fruit year-round (Service 1999; 61 FR 53108).

Historically, *Cenchrus agrimonioides* var. *agrimonioides* was known from Oahu, Lanai, the south slope of Haleakala and Ulupalakua on Maui, and (in an undocumented report) the island of Hawaii. Historically, *C. agrimonioides* var. *laysanensis* was known from Laysan, Kure, and Midway, all within what is now the Northwestern Hawaiian Islands National Wildlife Refuge, but has not been seen since 1973. This variety was never known from Maui. Currently, *C. agrimonioides* var. *agrimonioides* is known from Oahu and Maui. On Maui, this variety is known from one occurrence on State-owned land (Kanaio NAR) at Ukumehame and Kanaio, East Maui, containing an unknown number of individuals (Corn 1980; HINHP Database 2001; Service 1999; 61 FR 53108).

Cenchrus agrimonioides var. *agrimonioides* is found in mid-elevation dry forest or *Pleomele-Diospyros* forest associated with *Alyxia oliviformis, Dodonaea viscosa, Osteomeles anthyllidifolia,* or *Santalum ellipticum* at elevations between 471 and 1,091 m (1,544 and 3,579 ft) (HINHP Database 2001; Service 1999; 61 FR 53108; R. Hobdy, pers. comm., 2001).

The major threats to the only known occurrence of *Cenchrus agrimonioides* var. *agrimonioides* on Maui are competition with nonnative plant species, browsing and habitat degradation by goats and cattle and a risk of extinction from naturally occurring events and/or reduced reproductive vigor caused by the small number of existing individuals (Service 1999; 61 FR 53108).

Centaurium sebaeoides (Awiwi)

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

Centaurium sebaeoides has been observed flowering in April. Flowering may be induced by heavy rainfall. Occurrences are found in dry areas, and plants are more likely to be found following heavy rains. Little else is known about the life history of this plant. Its flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1999; 56 FR 55770).

Historically and currently, *Centaurium sebaeoides* is known from Kauai, Oahu, Molokai, Lanai, and Maui. On Maui, there are 3 occurrences of this species, with a total of more than 50 individuals, on State and privately owned lands at Kahakuloa Head, Lahoole, and Kupaa Gulch (HINHP Database 2001; Service 1999; Wagner *et al.* 1999; 56 FR 55770).

This species typically grows in volcanic or clay soils or on cliffs in windward coastal areas at elevations between 0 and 194 m (0 and 636 ft) and containing one or more of the following associated native plant species: *Bidens mauiensis; Lycium sandwicense* (ohelo kai); *Lysimachia mauritiana* (kolokolo kuahiwi); *Melanthera integrifolia* (nehe); *Panicum torridum* (kakonakona); *Scaevola taccada;* or *Schiedea globosa* (NCN) (HINHP Database 2001; Service 1999; Wagner *et al.* 1999; 56 FR 55770; R. Hobdy, pers. comm., 2001).

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

Clermontia lindseyana (Oha wai)

Clermontia lindseyana, a short-lived perennial member of the bellflower family (Campanulaceae), is a small, branched tree that grows 2.5 to 6 m (8.2 to 20 ft) tall. *Clermontia lindseyana* is either terrestrial or epiphytic. *Clermontia lindseyana* is easily distinguished from the other species within this genus by several characters: Much larger leaves and flowers; petals similar to sepals; and spreading floral lobes. Rock (1962) commented on the leaves being conspicuously hairy beneath (Cuddihy *et al.* 1983; Lammers 1999).

This species has been observed in fruit from June to October and in flower from February to August. Little else is known about the life history of *Clermontia lindseyana.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (HINHP Database 2001; Service 1996a; 59 FR 10305).

Historically, *Clermontia lindseyana* was known from Maui and the island of Hawaii. The two Maui occurrences are located in Waiopai and Wailaulau Gulches in the Kahikinui and Kula Forest Reserves on State and private lands, and are estimated to total about 330 individuals (GDSI 2001, HINHP Database 2001, Service 1996a, 59 FR 10305; Arthur Medeiros, USGS–BRD, *in litt.* 2000).

On Maui, *Clermontia lindseyana* grows in *Acacia koa* mesic forest containing one or more of the following associated native plant species: *Coprosma* spp.; *Cyrtandra* spp.; *Ilex anomala* (kawau); *Myrsine* spp.; or native fern species, at elevations between 1,142 and 1,870 m (3,747 and 6,134 ft) (HINHP Database 2001; Service 1996a; 59 FR 10305; R. Hobdy, pers. comm., 2001).

The threats to *Clermontia lindseyana* are trampling and grazing by cattle, trampling and browsing by goats, and trampling and rooting by pigs; competition with the nonnative plant *Pennisetum clandestinum;* and consumption of berries, flowers, and vegetation by black rats (Service 1996a; 59 FR 10305).

Clermontia oblongifolia ssp. *mauiensis* (Oha wai)

Clermontia oblongifolia ssp. *mauiensis,* a short-lived perennial member of the bellflower family (Campanulaceae), is a shrub or tree with oblong to lance-shaped leaves with 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). *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 (Lammers 1988, 1999; 57 FR 20772).

Clermontia oblongifolia ssp. *mauiensis* is known to flower from November to July. Little else is known about the life history of this species. Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Rock 1919; Service 1997; 57 FR 20772).

Historically, *Clermontia oblongifolia* ssp. *mauiensis* was known from Lanai and Honomanu Valley on Haleakala, East Maui. Currently, it is known from Lanai and West Maui. This species is currently known from one occurrence with an unknown number of individuals, at Kaulalewelewe on privately owned land within the West Maui Mountains Watershed Partnership (GDSI 2001; HINHP Database 2001; Lammers 1999; Service 1997; 57 FR 20772).

This plant typically grows on the sides of ridges and ridge tops in *Metrosideros polymorpha*-dominated montane wet forests at elevations between 414 and 1,764 m (1,358 and 5,787 ft) and containing one or more of the following associated native plant species: *Cheirodendron* spp. (NCN); *Clermontia* spp.; *Coprosma* spp.; *Dicranopteris linearis; Hedyotis* spp.; *Ilex anomala; Melicope* spp.; or *Myrsine* spp. (HINHP Database 2001; Service 1997; 57 FR 20772; R. Hobdy, pers. comm., 2001).

The only known population of this species on Maui is vulnerable to extinction from a natural or human-caused environmental disturbance caused by its small size; depressed reproductive vigor; competition with the nonnative plant species *Tibouchina herbacea;* and habitat degradation by feral pigs (Service 1997; 57 FR 20772).

Clermontia peleana (Oha wai)

Clermontia peleana, a member of the bellflower family (Campanulaceae) and a short-lived perennial, is an epiphytic shrub or tree that grows on native trees and tree ferns. Two subspecies are recognized: *C. peleana* ssp. *singuliflora* (with greenish-white petals) and *C. peleana* ssp. *peleana* (with blackish-purple petals). This species can be separated from other Hawaiian members of the genus by its epiphytic growth, small triangular green calyx lobes, and single-lipped flowers (Lammers 1999).

Clermontia peleana has been observed in flower during June and November, and in fruit during November. Little else is known about the life history of *C. peleana.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (HINHP Database 2001; Service 1996a; 59 FR 10305).

Clermontia peleana ssp. *singuliflora* was formerly found on the island of Hawaii and on East Maui, but has not been seen in either place since the early 1900s (HINHP Database 2001; Service 1996a; Wagner *et al.* 1999; 59 FR 10305; Lyman Perry, DOFAW, pers. comm., 2000).

Nothing is known of the preferred habitat of or native plant species associated with *Clermontia peleana* on the island of Maui (R. Hobdy, pers. comm., 2001; Service 1996a; 59 FR 10305) or of the threats to *Clermontia peleana* on the island of Maui (Service 1996a; 59 FR 10305).

Colubrina oppositifolia (Kauila)

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 has been observed in fruit and flower in September and June, and in flower during December and January. Little else is known about the

life history of *Colubrina oppositifolia*. Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (HINHP Database 2001; Service 1996a; 59 FR 10305).

Historically and currently, *Colubrina oppositifolia* is known from Oahu, Maui, and the island of Hawaii. Currently on Maui, there are two occurrences containing one individual each on privately owned land in Honokawai in Lahaina District and in Auwahi in Hana District (GDSI 2001; HINHP Database 2001; Service 1996a; Warshauer 1998; 59 FR 10305).

The habitat of this species is lowland dry and mesic forest dominated by *Diospyros sandwicensis,* at elevations between 192 and 929 m (630 and 3,047 ft) and containing one or more of the following associated native plant species: *Bidens micrantha* ssp. *micrantha* (kookoolau); *Canavalia* spp. (awikiwiki); *Dodonaea viscosa; Freycinetia arborea* (ieie); *Metrosideros polymorpha; Microlepia strigosa; Pleomele auwahiensis; Psydrax odorata; Reynoldsia sandwicensis;* or *Wikstroemia* spp. (HINHP Database 2001; Service 1996a; 59 FR 10305; R. Hobdy, pers. comm., 2001).

The threats to this species on Maui are habitat destruction by feral pigs, competition with the nonnative plants *Lantana camara* and *Schinus terebinthifolius,* the black twig borer, Chinese rose beetle (*Adoretus sinicus*), fire; and its small number of occurrences and limited distribution (Service 1996a; 59 FR 10305).

Ctenitis squamigera (Pauoa)

Ctenitis squamigera is a short-lived perennial of the woodfern family (Dryopteridaceae). *Ctenitis squamigera* can be readily distinguished from other Hawaiian species of *Ctenitis* by the dense covering of tan-colored scales on its frond (Degener and Degener 1957; Wagner and Wagner 1992).

Little is known about the life history of *Ctenitis squamigera.* Its reproduction cycles, dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1998a; 59 FR 49025).

Historically, *Ctenitis squamigera* was recorded from the islands of Kauai, Oahu, Molokai, Lanai, Maui, and Hawaii. It is currently found on Oahu, Lanai, Molokai, and Maui. On Maui, there are 12 occurrences with 41 individuals on State (West Maui Forest Reserve) and privately owned lands at Honolua, Kahana, Honokawai, Wahikuli, Kapilau Ridge, Paupau, and Hukoula within the West Maui Mountains Watershed Partnership (GDSI 2001; HINHP Database 2001; Service 1998a; 59 FR 49025; J. Lau *in litt.* 2000; J. Lau, pers. comm., 2000; H. Oppenheimer, *in litt.* 2000; K. Wood, pers. comm., 2000).

This species is found in the forest understory of *Metrosideros polymorpha* montane wet forest or diverse mesic forest at elevations between 74 and 1,593 m (243 and 5,226 ft) and containing one or more of the following native plant species: *Alyxia oliviformis; Antidesma* spp. (hame); *Bobea* spp. (ahakea); *Canavalia* spp.; *Coprosma* spp.; *Dicranopteris linearis; Doodia* spp. (okupukupu lauii); *Dryopteris* spp. (NCN); *Freycinetia arborea; Hedyotis terminalis; Hibiscus kokio* ssp. *kokio* (kokio); *Myrsine* spp.; *Peperomia* spp. (ala ala wainui); *Pittosporum* spp. (hoawa); *Pleomele* spp. (hala pepe); *Pritchardia* spp.; *Psychotria* spp.; *Remya mauiensis; Sadleria* spp.; *Schiedea pubescens* var. *pubescens* (NCN); or *Xylosma* spp. (HINHP Database 2001; Service 1998a; 59 FR 49025; R. Hobdy, pers. comm., 2001; H. Oppenheimer, pers. comm., 2000).

The primary threats to *Ctenitis squamigera* are habitat degradation by feral pigs, goats, and axis deer; competition with nonnative plant species, especially *Psidium cattleianum* and *Schinus terebinthifolius;* fire; and extinction from naturally occurring events caused by the small number of existing occurrences and individuals (Service 1998a; 59 FR 49025).

Cyanea grimesiana ssp. *grimesiana* (Haha)

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 1990).

On Molokai, flowering plants have been reported in July and August. Little else is known about the life history of *Cyanea grimesiana* ssp. *grimesiana.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1999; 61 FR 53108).

Historically and currently, *Cyanea grimesiana* ssp. *grimesiana* is known from Oahu, Molokai, Lanai, and scattered locations on Maui. Currently on Maui, there are two occurrences with a total of five individuals on privately owned land in Iao Valley and Kapilau Ridge (GDSI 2001; HINHP Database 2001; Service 1999; 61 FR 53108).

This species is typically found on rocky or steep slopes of stream banks in wet forest gulch bottoms often dominated by *Metrosideros polymorpha* at elevations between 312 and 1,617 m (1,024 and 5,305 ft) and containing one or more of the following associated native plant species: *Antidesma* spp.; *Bobea* spp.; *Myrsine* spp.; *Nestegis sandwicensis; Psychotria* spp.; or *Xylosma* spp. (Service 1999; 61 FR 53108; R. Hobdy, pers. comm., 2001).

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

Cyanea lobata (Haha)

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 1990).

Cyanea lobata is known to flower from August to February, even in individuals as small as 50 cm (20 in) in height. Little else is known about the life history of *Cyanea lobata.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Degener 1936; Rock 1919; Service 1997; 57 FR 20772).

Historically, *Cyanea lobata* was known from Lanai and West Maui. It is no longer extant on Lanai. On Maui, there are currently 5 occurrences with a total of 12 individuals on privately owned land within the West Maui Mountains Watershed Partnership at Kaulalewelewe, Honolowai, Honokohau, and Waikapu (GDSI 2001; HINHP Database 2001; Lammers 1999; Service 1997; 57 FR 20772).

This species has been seen and collected on steep stream banks in deep shade in wet forest at elevations between 204 and 1,530 m (669 and 5,020 ft) and containing one or more of the following associated native plant species: *Antidesma* spp.; *Athyrium* spp. (akolea); *Clermontia kakeana; Cyrtandra* spp.; *Freycinetia arborea; Metrosideros polymorpha; Morinda trimera* (noni

kuahiwi); *Peperomia* spp.; *Pipturus albidus; Pleomele* spp.; *Psychotria* spp.; *Touchardia latifolia;* or *Xylosma* spp. (HINHP Database 2001; Lammers 1999; Service 1997; 57 FR 20772; R. Hobdy, pers. comm., 2001).

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 caused by the small number of remaining individuals and the limited and scattered distribution of the species (Service 1997; 57 FR 20772).

Cyrtandra munroi (Haiwale)

Cyrtandra munroi, a short-lived perennial and member of the African violet family (Gesneriaceae), is a shrub with opposite, elliptic to almost circular leaves that 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).

The reproductive biology of some species of *Cyrtandra* has been studied, but not on *C. munroi* specifically. Studies of other members of the genus suggest that a specific pollinator may be necessary for successful pollination. Seed dispersal may be via birds that eat the fruits. Flowering time, longevity of plants and seeds, specific environmental requirements, and other limiting factors are unknown (Service 1995b; 57 FR 20772).

Cyrtandra munroi was historically and is currently known from Lanai and West Maui. Currently on Maui, there are 5 occurrences with a total of approximately 1,000 individuals on private and State (West Maui Forest Reserve) owned lands within the West Maui Mountains Watershed Partnership in Kahanaiki Gulch, Pulepule Gulch, Honokahua Gulch, along Makamakaole Stream, and Hahakea (GDSI 2001; HINHP Database 2001; Service 1995b; Wagner *et al.* 1999; 57 FR 20772).

The habitat of this species is rich, moist to wet, moderately steep talus slopes in lowland wet *Metrosideros polymorpha* forest at elevations between 390 and 1,108 m (1,280 and 3,635 ft) and containing one or more of the following associated native plant species: *Alyxia oliviformis; Bobea* spp.; *Clermontia* spp.; *Coprosma* spp.; *Cyrtandra* spp.; *Diospyros* spp. (lama); *Freycinetia arborea; Hedyotis acuminata; Melicope* spp.; *Myrsine* spp.; *Perrottetia sandwicensis; Pipturus* spp. (mamaki); *Pittosporum* spp.; *Pouteria sandwicensis; Psychotria* spp.; *Sadleria* spp.; *Scaevola* spp. (naupaka); *Sicyos* spp.; *Strongylodon ruber* (nuku iiwi); *Xylosma* spp.; or *Zanthoxylum kauense* (ae) (HINHP Database 2001; Service 1995b; 57 FR 20772; R. Hobdy, pers. comm., 2001).

The threats to this species on Maui are from competition with the nonnative plant species *Melinis minutiflora, Paspalum conjugatum, Pluchea carolinensis* (sourbush), *Psidium cattleianum,* and *Rubus rosifolius;* 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 caused by the small number of occurrences on Maui (Service 1995b; 57 FR 20772).

Delissea undulata (NCN)

Delissea undulata, a member of the bellflower family (Campanulaceae) and a short-lived perennial, is an unbranched, palm-like, woody-stemmed tree with a dense cluster of leaves at the tip of the stem. One or two knob-like structures often occur on the back of the flower tube. Three subspecies, all but the last of which are considered extinct, may be separated on the basis of leaf shape and margin characters: In *D. undulata* var. *kauaiensis,* the leaf blades are oval and flat-margined with sharp teeth; in *D. undulata* var. *niihauensis,* the leaf blades are heart shaped and flat-margined with shallow, rounded teeth; and in *D. undulata* var. *undulata,* the leaf blades are elliptic to lance-shaped and wavy-margined with small, sharply pointed teeth. This species is separated from the other closely related members of the genus by its large flowers and berries and broad leaf bases. *Delissea undulata* ssp. *undulata* is the only subspecies known from Maui (Lammers 1990).

Delissea undulata var. *undulata* has been observed in fruit and flower during December. Little else is known about the life history of *D. undulata* var. *undulata.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (HINHP Database 2001; Service 1996a; 61 FR 53124).

Delissea undulata var. *undulata* was known from southwestern Maui, western Hawaii, and Niihau. Currently it occurs on Kauai and the island of Hawaii (GDSI 2001; HINHP Database 2001; Service 1996a; 61 FR 53124; Linda Pratt, USGS-BRD, pers. comm., 2001; K. Wood, pers. comm., 2001).

Nothing is known of the preferred habitat of or native plant species associated with *Delissea undulata* var. *undulata* on the island of Maui (Service 1996a; 61 FR 53124; R. Hobdy, pers. comm., 2001) or of the threats to *Delissea undulata* var. *undulata* on the island of Maui (Service 1996a; 61 FR 53124).

Diellia erecta (Asplenium-leaved diellia)

Diellia erecta, a short-lived perennial fern in the spleenwort family (Aspleniaceae), grows in tufts of three to nine 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 (Degener and Greenwell 1950; Smith 1934; Wagner 1952).

Little is known about the life history of *Diellia erecta.* Reproduction cycles, dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1999; 59 FR 56333).

Historically, *Diellia erecta* was known on Kauai, Oahu, Molokai, Lanai, Maui, and the island of Hawaii. Currently, it is known from Kauai, Molokai, Maui, and Hawaii. On Maui, there are 5 known occurrences with a total of 35 individual plants on State (West Maui Forest Reserve, Manawainui Plant Sanctuary, and Department of Hawaiian Home Lands) and privately owned lands within the West Maui Mountains Watershed Partnership in Iao Valley, Hanaulaiki, Manawainui Gulch, near Polipoli in Kamaole, and west of Waiopai Gulch (GDSI 2001; HINHP Database 2001; Service 1999; 59 FR 56333).

This species is found in steep slopes or gulch sides in deep shade in *Acacia koa-Metrosideros polymorpha* low-to mid-elevation mesic forests between 338 and 1,744 m (1,109 and 5,722 ft) and containing one or more of the following associated native plant species: *Coprosma* spp.; *Dodonaea viscosa; Dryopteris unidentata* (akole); *Leptecophylla tameiameiae; Melicope* spp.; *Myrsine* spp.; *Osteomeles anthyllidifolia;* or *Psychotria* spp. (HINHP Database 2001; Service 1999; 59 FR 56333; R. Hobdy, pers. comm., 2001).

The major threats to *Diellia erecta* on Maui are habitat degradation by pigs, goats, and cattle; competition with nonnative plant species, including

Blechnum occidentale (NCN); and random naturally occurring events that could cause extinction and/or reduced reproductive vigor caused by the small number of existing individuals (Service 1999; 59 FR 56333).

Diplazium molokaiense (NCN)

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).

Little is known about the life history of *Diplazium molokaiense.* Reproductive cycles, dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1998a; 59 FR 49025).

Historically, *Diplazium molokaiense* was found on Kauai, Oahu, Molokai, Lanai, and East and West Maui. Currently, this species is only known from Maui. Four occurrences with a total of 23 individuals are found on State (Kula and Kahikinui Forest Reserves) and privately owned lands within the East Maui Watershed Partnership near Polipoli in Kamaole, between Kahakapao Gulch and Puu O Kakae, Honomanu, and Waiopai Gulch (GDSI 2001; HINHP Database 2001; Service 1998a; Warshauer 1998; 59 FR 49025).

This species occurs near water courses, often in proximity to waterfalls, in lowland or montane mesic *Metrosideros polymorpha-Acacia koa* forest at elevations between 273 and 1,917 m (896 and 6,289 ft) (HINHP Database 2001; Service 1998a; 59 FR 49025; R. Hobdy, pers. comm., 2001).

The primary threats on Maui are habitat degradation by feral goats, cattle, pigs, and axis deer; competition with nonnative plant species; decreased reproductive vigor; and extinction from randomly occurring natural events caused by the small number of occurrences and individuals (HINHP Database 2001; Service 1998a; 59 FR 49025).

Flueggea neowawraea (Mehamehame)

Flueggea neowawraea, a long-lived perennial 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 similar Hawaiian species in the family by its hairless whitish lower leaf surfaces and round fruits (Hayden 1999; Linney 1982; Neal 1965; Service 1999).

Individual trees of *Flueggea neowawraea* bear only male or female flowers, and must be cross-pollinated from a different tree to produce viable seed. Little else is known about the life history of *F. neowawraea.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Hayden 1999; Service 1999; 59 FR 56333).

Historically, *Flueggea neowawraea* was known from the islands of Oahu, Kauai, Molokai, and Hawaii. Currently, occurrences are known from Kauai, Oahu, East Maui, and Hawaii. On Maui, there are four occurrences on State (DHHL) and privately owned lands at Auwahi, and above Lualailua and Alena (GDSI 2001; HINHP Database 2001; Service 1999; 59 FR 56333; Mahealani Kaiaokamalie, Ulupalakua Ranch, *in litt.* 2000).

Flueggea neowawraea occurs in dry or mesic forest at elevations between 633 and 971 m (2,078 and 3,186 ft) and containing one or more of the following associated native plant species: *Alectryon macrococcus; Antidesma pulvinatum; Bobea timonioides* (ahakea); *Charpentiera* spp. (papala); *Diplazium sandwichianum; Diospyros* spp.; *Myrsine lanaiensis* (kolea); *Nesoluma polynesicum* (keahi); *Nestegis sandwicensis; Pleomele auwahiensis; Pleomele* spp.; *Pouteria sandwicensis; Psydrax odorata; Rauvolfia sandwicensis* (hao); or *Tetraplasandra* spp. (oheohe) (HINHP Database 2001; Service 1999; 59 FR 56333; R. Hobdy, pers. comm., 2001).

The threats to the populations on Maui are the black twig borer; habitat degradation by feral pigs, goats, deer, and cattle; competition with nonnative plant species; depressed reproductive vigor; the risk of extinction from a random environmental event caused by the small number of individuals; and predation of the fruit by rats (HINHP Database 2001; Service 1999; 59 FR 56333).

Gouania vitifolia (NCN)

Gouania vitifolia, a member of the buckthorn family (Rhamnaceae) and a short-lived perennial, is a climbing shrub with tendriled flowering branches. This species differs from other members of its genus by having flowering branches with a tendril and coarsely wavy to toothed leaf margins (Wagner *et al.* 1999).

In winter and late spring, the main vine of *Gouania vitifolia* produces new young side shoots which soon die. Plants have been observed flowering from late November to January, but flowering probably depends on precipitation. Little else is known about the life history of *G. vitifolia.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1998b; 59 FR 32932).

Historically, *Gouania vitifolia* was known from West Maui, the Kau District of the island of Hawaii, and Oahu. The species currently occurs on Oahu and on the island of Hawaii (GDSI 2001; Service 1998b; 59 FR 32932; Jon Giffin, DOFAW, *in litt.* 2000).

On Maui, *Gouania vitifolia* typically grows on the sides of ridges and gulches in dry to mesic forests at elevations between 155 and 1,326 m (509 and 4,350 ft). Associated plant species include: *Bidens* spp.; *Carex meyenii* (NCN); *Chamaesyce* spp. (akoko); *Diospyros sandwicensis; Dodonaea viscosa; Erythrina sandwicensis; Hedyotis* spp.; *Hibiscus* spp.; *Melicope* spp.; *Nestegis sandwicensis; Pipturus albidus; Psychotria* spp.; or *Urera glabra* (opuhe) (Service 1998b; 59 FR 32932; J. Lau, pers. comm., 2001).

Nothing is known of the threats to *Gouania vitifolia* on the island of Maui (Service 1998b; 59 FR 32932).

Hedyotis coriacea (Kioele)

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 *Hedyotis coriacea.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1997; 57 FR 20772).

Historically, *Hedyotis coriacea* was known from Oahu and the island of Hawaii. Considered extinct on all islands in recent years, this species was discovered 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. Currently, only a single individual is known from West Maui on State-owned

land within the West Maui Mountains Watershed Partnership (GDSI 2001; HINHP Database 2001; Service 1997; 57 FR 20772).

Hedyotis coriacea is found on steep, rocky slopes in dry lowland *Dodonaea viscosa*-dominated shrublands at elevations between 110 and 937 m (361 and 3,074 ft) and containing one or more of the following associated native plant species: *Bidens menziesii* (kookoolau); *Gouania hillebrandii* (NCN); *Melanthera lavarum; Myoporum sandwicense; Schiedea menziesii* (NCN); or *Sida fallax* (HINHP Database 2001; Service 1997; 57 FR 20772; R. Hobdy, pers. comm., 2001).

The single remaining individual of *Hedyotis coriacea* on Maui is threatened by extinction from a random naturally occurring event (Service 1997; 57 FR 20772).

Hedyotis mannii (Pilo)

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. 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).

Little is known about the life history of *Hedyotis mannii.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1996b; 57 FR 46325).

Currently and historically, *Hedyotis mannii* is known from Lanai, West Maui, and Molokai. On Maui, there is a single occurrence of approximately 20 individuals located on private land in Kauaula Valley (GDSI 2001; Service 1996b; 57 FR 46325; K. Wood, *in litt.* 2000).

The occurrence on Maui is found on basalt cliffs along stream banks in *Metrosideros polymorpha-Dicranopteris linearis* montane wet forest at elevations between 340 and 1,593 m (1,115 and 5,226 ft) and containing one or more of the following associated native plant species: *Boehmeria grandis; Carex meyenii; Cyanea* spp. (haha); *Cyrtandra grayi* (haiwale); *Cyrtandra hawaiensis* (haiwale); *Cyrtandra platyphylla* (ilihia); *Hedyotis acuminata; Isachne distichophylla* (ohe); *Machaerina* spp. (uki); *Phyllostegia* spp. (NCN); *Pipturus albidus; Psychotria spp.; Touchardia latifolia;* or *Urera glabra* (Service 1996b; 57 FR 46325; R. Hobdy, pers. comm., 2001; K. Wood, *in litt.* 2000).

Hedyotis mannii on Maui is threatened by landslides; competition with the nonnative plant species *Ageratina adenophora, Buddleia asiatica* (butterfly bush), *Clidemia hirta, Pluchea carolinensis* (sourbush), and *Rubus rosifolius;* and the low number of individuals which makes it extremely vulnerable to extinction by random naturally occurring events (Service 1996b; 57 FR 46325; K. Wood, *in litt.* 2000).

Hesperomannia arborescens (NCN)

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 has been observed in flower from April through June and in fruit during March and June. Little else is known about the life history of *Hesperomannia arborescens.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1998b; 59 FR 14482).

Hesperomannia arborescens was formerly known from Oahu, Molokai, and Lanai. This species is now known from Oahu, Molokai, and Maui. There are four occurrences with a total of six individuals on State (Kahukuloa section of the West Maui NAR) and privately owned lands in Honokohau and Lanilii within the West Maui Mountains Watershed Partnership (GDSI 2001; HINHP Database 2001; Service 1998b; 59 FR 14482).

Hesperomannia arborescens is found on slopes or ridges in lowland mesic or wet forest at elevations between 346 and 1,422 m (1,135 and 4,665 ft) and containing one or more of the following associated native plant species: *Antidesma* spp.; *Bobea* spp.; *Cheirodendron* spp.; *Clermontia* spp.; *Cibotium* spp.; *Coprosma* spp.; *Dicranopteris linearis; Freycinetia arborea; Isachne distichophylla; Machaerina* spp.; *Melicope* spp.; *Metrosideros polymorpha; Myrsine sandwicensis* (kolea); *Pipturus* spp.; *Psychotria* spp.; or *Sadleria* spp. (HINHP Database 2001; Service 1998b; 59 FR 14482; R. Hobdy, pers. comm., 2001).

The major threats to *Hesperomannia arborescens* on Maui are habitat degradation by feral pigs and goats; competition with nonnative plant species; impact by humans; and extinction caused by random environmental events or reduced reproductive vigor caused by the small number of remaining individuals (HINHP Database 2001; Service 1998b; 59 FR 14482).

Hesperomannia arbuscula (NCN)

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 6 weeks and trees live about 10 to 15 years. Little else is known about the life history of *H. arbuscula.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1998b; 56 FR 55770).

Historically and currently, *Hesperomannia arbuscula* is known from Oahu and West Maui. On Maui, there are 8 occurrences with a total of 37 individuals, on privately owned land along Waihee Stream and Nakalaloa within the West Maui Mountains Watershed Partnership (GDSI 2001; HINHP Database 2001; Service 1998b; 56 FR 55770; K. Wood, *in litt.* 1999).

Hesperomannia arbuscula typically grows on steep forested slopes and ridges in mesic forest dominated by *Metrosideros polymorpha* or *Diospyros sandwicensis* at elevations between 354 and 1,453 m (1,161 and 4,767 ft) and containing one or more of the following associated native plant species: *Alyxia oliviformis; Bidens* spp.; *Cheirodendron* spp.; *Clermontia* spp.; *Cyanea spp.; Psychotria* spp.; or *Tetraplasandra* spp. (HINHP Database 2001; Service 1998b; 56 FR 55770; R. Hobdy and J. Lau, pers. comm., 2001).

The major threats to *Hesperomannia arbuscula* on Maui are habitat degradation by feral pigs, competition from nonnative plant species, trampling by humans, and extinction from naturally occurring random events caused by the small number of occurrences (Service 1998b; 56 FR 55770).

Hibiscus brackenridgei (Mao hau hele)

Hibiscus brackenridgei, a short-lived perennial member of the mallow family (Malvaceae), is a sprawling to erect

shrub or small tree. This species differs from other members of the genus in having the following combination of characteristics: Yellow petals; a calyx consisting of triangular lobes with raised veins and a single midrib; bracts attached below the calyx, and thin stipules (leaf bracts) that fall off, leaving an elliptical scar. Two subspecies are currently recognized, *Hibiscus brackenridgei* ssp. *brackenridgei* and *H. brackenridgei* ssp. *mokuleianus* (Bates 1990).

Hibiscus brackenridgei is known to flower continuously from early February through late May, and intermittently at other times of year. Intermittent flowering may possibly be tied to day length. Little else is known about the life history of *H. brackenridgei.* Pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1999; 59 FR 56333).

Historically, *Hibiscus brackenridgei* was known from the islands of Kauai, Oahu, Lanai, Maui, Molokai, Kahoolawe, and Hawaii. Currently, *H. brackenridgei* ssp. *mokuleianus* is known from Oahu and from undocumented observations on Kauai. *Hibiscus brackenridgei* ssp. *brackenridgei* is currently known from Lanai, Maui, and Hawaii. On Maui, *H. brackenridgei* ssp. *brackenridgei* is found in 5 occurrences, containing 40 individuals, on State (Lihau section of West Maui NAR and DHHL) and privately owned lands at Lihau, Kaonohua, Keokea, and near Puu O Kali (Bates 1990; GDSI 2001; HINHP Database 2001; Service 1999; 59 FR 56333).

Hibiscus brackenridgei ssp. *brackenridgei* occurs in lowland dry forest sometimes with *Erythrina sandwicensis* as the dominant tree at elevations between 43 and 771 m (141 and 2,530 ft) and containing one or more of the following associated native plant species: *Achyranthes* spp. (NCN); *Chamaesyce celastroides* var. *lorifolia; Chenopodium* spp. (aheahea); *Diospyros* spp.; *Dodonaea viscosa; Melanthera lavarum; Myoporum sandwicense; Nototrichium* spp.; annual *Panicum* spp.; *Psydrax odorata; Schiedea salicaria* (NCN); or *Sida fallax* (HINHP Database 2001; Service 1999; 59 FR 56333; R. Hobdy, pers. comm., 2001).

The primary threats to *Hibiscus brackenridgei* ssp. *brackenridgei* on Maui and Kahoolawe are habitat degradation and possible predation by pigs, goats, cattle, axis deer, and rats; competition with nonnative plant species; fire; and extinction caused by random environmental events or reduced reproductive vigor caused by small occurrence size and the limited number of individuals (Service 1999; 59 FR 56333).

Ischaemum byrone (Hilo ischaemum)

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 (slender bristle) and two-flowered; and a two-or three-tiered-branching inflorescence (O'Connor 1999).

Little is known about the life history of *Ischaemum byrone.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1996a; 59 FR 10305).

Historically, *Ischaemum byrone* was reported from Kauai, Oahu, Molokai, East Maui, and the island of Hawaii. Currently, this species is found on Kauai, Molokai, Maui, and Hawaii. On Maui, there are 6 occurrences with less than 2,000 individuals found on State and privately owned lands at Keopuka Rock, Paupalu Point, Moku Huki, west of Kalahu Point, between Keakulikuli Point and Pukaulua Point, and Kauiki Head (GDSI 2001; HINHP Database 2001; Service 1996a; 59 FR 10305).

Ischaemum byrone grows in close proximity to the ocean, among rocks or on basalt cliffs in windward coastal dry shrubland at elevations between 0 and 190 m (0 and 623 ft) and containing one or more of the following associated native plant species: *Bidens* spp. *Fimbristylis cymosa* (mauu akiaki) or *Scaevola taccada* (HINHP Database 2001; Service 1996a; 59 FR 10305; R. Hobdy, pers. comm., 2001).

The most serious threat to *Ischaemum byrone* is the invasion of nonnative plant species, particularly *Digitaria ciliaris* (Henry's crabgrass), *Ardisia elliptica* (shoebutton ardisia), and *Casuarina equisetifolia* (ironwood). Additionally, fire may pose a threat in areas infested with nonnative 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 nonnative weeds. Some occurrences are also threatened by residential development (HINHP Database 2001; Service 1996a; 59 FR 10305).

Isodendrion pyrifolium (Wahine noho kula)

Isodendrion pyrifolium, a short-lived perennial of the violet family (Violaceae), is a small, branched shrub with elliptic to lance-shaped leaf blades. The papery-textured blade has moderately hairy veins. Below the petiole are oval, hairy stipules. *Isodendrion pyrifolium* is distinguished from other species in the genus by its smaller, green-yellow flowers and hairy stipules and leaf veins (Wagner *et al.* 1999).

During periods of drought, this species will drop all but the newest leaves. After sufficient rains, the plants produce flowers with seeds ripening one to two months later. Little else is known about the life history of *Isodendrion pyrifolium.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1996a; 59 FR 10305).

Isodendrion pyrifolium is known historically from six of the Hawaiian Islands: Niihau, Molokai, Lanai, Oahu, Maui, and the island of Hawaii. Currently, it is only found on the island of Hawaii (GDSI 2001; HINHP Database 2001; Service 1996a; 59 FR 10305; Marie Bruegmann, Service, pers. comm., 2000).

On Maui, *Isodendrion pyrifolium* occured in dry shrubland at elevations between 54 and 557 m (177 and 1,827 ft) with one or more of the following associated native plant species: *Capparis sandwichiana; Dodonaea viscosa; Myoporum sandwicense;* or *Psydrax odorata* (Service 1996a; 59 FR 10305; R. Hobdy and J. Lau, pers. comm., 2001).

Nothing is known of the threats to *Isodendrion pyrifolium* on the island of Maui (Service 1996a; 59 FR 10305).

Lysimachia lydgatei (NCN)

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).

Little is known about the life history of *Lysimachia lydgatei.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1997; 57 FR 20772).

Lysimachia lydgatei was known historically from a gulch behind

Lahaina on West Maui and from Oahu. Currently, it is found only on Maui on State (Lihau section of West Maui NAR and the West Maui Forest Reserve) and privately owned lands at Helu, Lihau, east of Halepohaku, and Ulaula within the West Maui Mountains Watershed Partnership. The 4 Maui occurrences number approximately 240 individuals (GDSI 2001; HINHP Database 2001; Service 1997; Wagner *et al.* 1999; 57 FR 20772).

Lysimachia lydgatei typically grows on the sides of steep ridges in *Metrosideros polymorpha-Dicranopteris linearis*-dominated wet to mesic shrubland or *Metrosideros polymorpha-Cheirodendron* spp. montane forest at elevations between 829 and 1,432 m (2,720 and 4,698 ft) and containing one or more of the following associated native plant species: *Astelia* spp. (painiu); *Broussaisia arguta; Coprosma* spp.; *Dodonaea viscosa; Eurya sandwicensis* (anini); *Ilex anomala; Leptecophylla tameiameiae; Lycopodium* spp. (wawae iole); *Ochrosia* spp. (holei); *Vaccinium* spp.; or mat ferns such as *Dicranopteris* spp. (HINHP Database 2001; Service 1997; 57 FR 20772; R. Hobdy, pers. comm., 2001).

The greatest threats to *Lysimachia lydgatei* are extinction from a random environmental event caused by the small number of occurrences; competition with nonnative plant species such as *Rubus argutus;* and fire (Service 1997; 57 FR 20772).

Mariscus pennatiformis (NCN)

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 divided 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 fruit. 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 1990).

Mariscus pennatiformis is known to flower from November to December after heavy rainfall. Little else is known about the life history of *M. pennatiformis.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1999; 59 FR 56333).

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. *Mariscus pennatiformis* ssp. *bryanii* is only known from Laysan Island. *Mariscus pennatiformis* ssp. *pennatiformis* is currently found only on East Maui. Two occurrences of approximately 30 individuals are found on State-owned land near the mouth of Hanawi Stream (GDSI 2001; HINHP Database 2001; Service 1999; 59 FR 56333; K. Wood, *in litt.* 1999).

On Maui, *Mariscus pennatiformis* ssp. *pennatiformis* is found on cliffs with brown soil and talus within reach of ocean spray in *Pandanus tectorius* (hala) coastal wet forests at elevations between 0 and 188 m (0 and 615 ft) and containing one or more of the following associated native plant species: *Cyperus laevigatus* (makaloa); *Eragrostis* spp. (NCN); *Ipomoea* spp. (morning glory); *Lysimachia mauritiana;* or *Sadleria pallida* (HINHP Database 2001; Service 1999; 59 FR 56333; J. Lau, pers. comm., 2001; K. Wood, *in litt.* 1999).

Threats to *Mariscus pennatiformis* ssp. *pennatiformis* on Maui include grazing and habitat destruction caused by ungulates; competition with nonnative plant species; and extinction from random naturally occurring events (Service 1999; 59 FR 56333).

Melicope knudsenii (Alani)

Melicope knudsenii, a long-lived perennial member of the rue 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. haupuensis* and other members of the genus by the distinct carpels (chambers) present in the fruit, a hairless endocarp (fruit wall), a larger number of flowers per cluster, and the distribution of hairs on the underside of the leaves (Stone *et al.* 1999).

Little is known about the life history of *Melicope knudsenii.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1995a; 59 FR 9304).

Historically and currently, *Melicope knudsenii* is known from the southeastern slope of Haleakala on Maui and from Kauai. Currently on Maui, there are four occurrences on State (DHHL) and privately owned lands from Puu Mahoe to east of Puu Ouli (GDSI 2001; HINHP Database 2001; Service 1995a; 59 FR 9304).

Melicope knudsenii grows in *Nestegis sandwicensis-Pleomele* sp. mixed open dry forests at elevations between 648 and 1,331 m (2,125 and 4,367 ft) and containing one or more of the following associated native plant species: *Alphitonia ponderosa; Dodonaea viscosa; Osteomeles anthyllidifolia; Santalum ellipticum;* or *Xylosma hawaiiense* (HINHP Database 2001; Service 1995a; 59 FR 9304; R. Hobdy, pers. comm., 2001).

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

Melicope mucronulata (Alani)

Melicope mucronulata, a long-lived perennial of the rue 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).

Little is known about the life history of *Melicope mucronulata.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1997; 57 FR 20772).

First discovered in 1920 in Kanaio, East Maui, *Melicope mucronulata* was not relocated until 1983 when it was reported from privately owned land with an unknown number of plants in Auwahi. This species was also found two years later on East Molokai (GDSI 2001; HINHP Database 2001; Service 1997; Stone *et al.* 1999; 57 FR 20772).

Melicope mucronulata typically grows on gentle south-facing slopes in lowland dry to mesic forest at elevations between 625 and 1,331 m (2,050 and 4,367 ft) and containing one or more of the following associated species: *Antidesma pulvinatum; Dodonaea viscosa; Melicope hawaiensis* (alani); *Nestegis sandwicensis; Pleomele auwahiensis; Pouteria sandwicensis;* and *Streblus pendulinus* (Service 1997; 57 FR 20772; J. Lau, pers. comm., 2001).

The major threat to the continued existence of the only known occurrence 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 nonnative plant species, particularly *Melinis minutiflora,* also pose immediate threats to this species (Service 1997; 57 FR 20772).

Neraudia sericea (NCN)

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 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. *Neraudia sericea* differs from the other four 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).

Little is known about the life history of *Neraudia sericea.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1999; 59 FR 56333).

Neraudia sericea was known historically from Molokai, Lanai, Olowalu Valley on West Maui, the southern slopes of Haleakala on East Maui, and from Kahoolawe. Currently, this species is known from Molokai and Maui. On Maui, five occurrences are found on State (DHHL) and privately owned lands in Pohakea Gulch (West Maui) and in Manawainui and Kamole Gulches (East Maui) (GDSI 2001; HINHP Database 2001; Service 1999; 59 FR 56333; M. Kaiaokamalie, *in litt.* 2000).

Neraudia sericea generally occurs in dry to mesic *Metrosideros polymorpha-Dodonaea viscosa-Leptecophylla tameiameiae* shrubland or forest or *Acacia koa* forest at elevations between 198 and 1,658 m (650 and 5,439 ft) and containing one or more of the following associated native plant species: *Bobea* spp.; *Coprosma* spp.; *Cyrtandra oxybapha* (haiwale); *Cyrtandra* spp.; *Diospyros* spp.; *Hedyotis* spp.; *Sida fallax;* or *Urera glabra* (HINHP Database 2001; Service 1999; Wagner *et al.* 1999; 59 FR 56333; M. Bruegmann, *in litt.* 1995; R. Hobdy, pers. comm., 2001).

The primary threats to *Neraudia sericea* on Maui are habitat degradation by feral pigs and goats; competition with the nonnative plant species *Cymbopogon refractus* (barbwire grass), *Eragrostis* spp. (love grass), *Holcus lanatus, Melinus minutiflora,* and *Pennisetum clandestinum;* and a risk of extinction caused by random environmental events (Service 1999; 59 FR 56333).

Nototrichium humile (Kului)

Nototrichium humile, a member of the amaranth family (Amaranthaceae), is an upright to trailing shrub with branched stems to 1.5 m (5 ft) long. This species is distinguished from the only other species in the genus by its inflorescence, a slender spike 4 mm (0.2 in) in diameter or less, which is covered with short hairs (Wagner *et al.* 1999).

Nototrichium humile has been observed flowering after heavy rain, but flowering is generally heaviest in the spring and summer. Fruits mature a few weeks after flowering. In cultivation, this species is known to live for more than a decade. Little else is known about the life history of *N. humile.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1998b; 56 FR 55770).

Historically, *Nototrichium humile* was known from Oahu and Maui. It currently occurs only on Oahu. On Maui, *N. humile* was last seen in the wild by Robert Hobdy in 1979 in Pohakea Gulch (HINHP Database 2001; Service 1998b; 56 FR 55770).

On Maui, *Nototrichium humile* occurred on old cinder cones in dry shrubland at elevations between 338 and 734 m (1,110 and 2,407 ft) with one or more of the following associated native plant species: *Dodonaea viscosa; Erythrina sandwicensis; Heteropogon contortus;* and *N. sandwicense* (kului) (Service 1998b; 56 FR 55770; J. Lau, pers. comm., 2001).

Nothing is known of the threats to *Nototrichium humile* on the island of Maui (Service 1998b; 56 FR 55770).

Peucedanum sandwicense (Makou)

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. It is distinguished from other Hawaiian members of the family by being a slightly succulent perennial herb and having broad basal leaflets, white flowers, and by its floral bracts, the size and shape of its fruit, and the oil glands in the fruit wall (Constance and Affolter 1999).

Little is known about the life history of *Peucedanum sandwicense.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1995a; 59 FR 9304).

Historically and currently, *Peucedanum sandwicense* is known from Molokai, Maui, and Kauai. Discoveries in 1990 extended the known distribution of this species to the island of Oahu. Currently on Maui, there are 3 occurrences on State and privately owned lands at Keopuka Islet, near Pauwalu Point, and east of Hanawi Stream, with a total of 32 individuals (GDSI 2001; HINHP Database 2001; Service 1995a; 59 FR 9304).

This species grows on sparsely vegetated steep to vertical cliff habitats with little soil in mesic or coastal communities at elevations between 0 and 1,132 m (0 and 3,714 ft) and containing one or more of the following associated native species: *Artemisia australis; Bidens* spp.; *Carex* spp.; *Chamaesyce* spp.; *Diospyros sandwicensis; Eragrostis* spp.; *Hedyotis littoralis; Lysimachia mauritiana; Metrosideros polymorpha; Peperomia* spp.; *Pandanus tectorius* (hala); *Scaevola taccada;* or *Schiedea globosa* (NCN) (Constance and Affolter 1999; HINHP Database 2001; Service 1995a; 59 FR 9304; R. Hobdy and J. Lau pers. comms., 2001).

Competition with introduced plants is the major threat to *Peucedanum sandwicense* on Keopuka Rock. Additionally, small occurrence sizes also make the species subject to extinction caused by random environmental events (Service 1995a; 59 FR 9304).

Phlegmariurus mannii (Wawae iole)

Phlegmariurus (=*Huperzia,* =*Lycopodium*) *mannii,* a short-lived perennial member of the clubmoss family (Lycopodiaceae), is a hanging epiphyte with clustered, delicate red stems and forked reproductive spikes. These traits distinguish it from others in the genus in Hawaii (Degener and Degener 1959; Holub 1991; St. John 1981; Wagner and Wagner 1992).

Little is known about the life history of *Phlegmariurus mannii.* Reproductive cycles, dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1997; 57 FR 20772).

Historically, *Phlegmariurus mannii* was known from Kauai, West Maui (Haelaau and Hanaula), and the island of Hawaii. Currently, this species is found on Maui and Hawaii. On Maui, this species is now known on State (Lihau section of West Maui NAR, Makawao Forest Reserve, DHHL, and Kipahulu Forest Reserve), Federal and privately owned lands in Honokohau, Lihau, Puu Okakae, Manawainui, Healani Stream, Puu Ahulili, and Kaapahu within the East Maui Watershed Partnership and the West Maui Mountains Watershed Partnership. There are 7 occurrences with a total of 22 individuals on Maui (GDSI 2001; HINHP Database 2001; Service 1997; 57 FR 20772).

On Maui, *Phlegmariurus mannii* typically grows as an epiphyte on

Metrosideros polymorpha, Dodonaea viscosa and *Acacia koa* trees in moist, protected gulches or mossy tussocks in mesic to wet montane *Metrosideros polymorpha-Acacia koa* forests at elevations between 446 and 1,688 m (1,464 and 5,539 ft) and containing one or more of the following associated native plant species: *Astelia menziesiana* (kaluaha); *Athyrium* spp.; *Cheirodendron trigynum; Christella* spp. (NCN); *Coprosma* spp.; *Cyanea* spp.; *Cyrtandra* spp.; *Ilex anomala; Leptecophylla tameiameiae; Machaerina* spp.; *Sadleria* spp.; or *Vaccinium* spp. (Service 1997; 57 FR 20772; R. Hobdy, pers. comm., 2001).

The primary threats to this species are habitat alteration by goats, cattle and pigs, and the impacts of nonnative plant species. Additionally, small occurrence sizes also make the species subject to extinction caused by random environmental events (Service 1997; 57 FR 20772).

Phyllostegia mannii (NCN)

Phyllostegia mannii, a non-aromatic member of the mint family (Lamiaceae), is a climbing vine with many-branched, four-sided, hairy stems. This species is distinguished from others in the genus by its hairiness; its thin, narrow leaves, which are not pinnately divided; and the usually six flowers per false whorl in a terminal inflorescence (Wagner *et al.* 1999).

This species has been observed with fruit in July. Little else is known about the life history of *Phyllostegia mannii.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1996b; 57 FR 46325).

Historically, *Phyllostegia mannii* was found from Hanalilolilo to Ohialele on East Molokai and at Ukulele on East Maui. It has not been seen on Maui for over 70 years. This species is now known only from Molokai (HINHP Database 2001; Service 1996b; 57 FR 46325).

On Maui, *Phyllostegia mannii* occured on gentle slopes and the steep sides of gulches in mesic to wet forest dominated by *Acacia koa* and/or *Metrosideros polymorpha* at elevations between 1,069 and 1,615 m (3,506 and 5,297 ft) with one or more of the following associated native plant species: *Alyxia oliviformis; Cheirodendron trigynum; Dicranopteris linearis; Diplazium sandwichianum; Melicope* spp.; or *Myrsine lessertiana* (Service 1996b; 57 FR 46325; J. Lau, pers. comm., 2001).

Nothing is known of the threats to *Phyllostegia mannii* on the island of Maui (Service 1996b; 57 FR 46325).

Phyllostegia mollis (NCN)

Phyllostegia mollis, a short-lived member of the mint family (Lamiaceae), grows as a nearly erect, densely hairy, nonaromatic, perennial herb. Characteristics concerning the kind and amount of hair, the number of flowers in a cluster, and details of other plant parts separate this species from other members of the genus (Wagner *et al.* 1990).

Individual *Phyllostegia mollis* plants live for approximately 5 years. The species is known to flower in late winter and spring. Little else is known about the life history of *P. mollis.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1998b; 56 FR 55770).

Historically, *Phyllostegia mollis* was known from Oahu, Molokai, and East Maui. Currently, this species is only known from Oahu and Maui. On East Maui, a single occurrence with an unknown number of individuals remains on State (on the border of Kahikinui Forest Reserve and DHHL) land in Waiopai Gulch (GDSI 2001; HINHP Database 2001; Service 1998b; Wagner *et al.* 1999; 56 FR 55770).

Phyllostegia mollis typically grows on steep slopes and in gulches in mesic forests dominated by *Metrosideros polymorpha* and/or *Acacia koa* at elevations between 1,144 and 1,970 m (3,754 and 6,463 ft). Associated native plant species include *Alyxia oliviformis, Cheirodendron trigynum, Diplazium sandwichianum, Melicope* spp., and *Myrsine lessertiana* (Service 1998b; 56 FR 55770; J. Lau, pers. comm., 2001).

The major threats to *Phyllostegia mollis* are competition from the nonnative plant species *Rubus* spp. and *Schinus terebinthifolius,* and a risk of extinction of the only known occurrence of this species on Maui caused by random environmental events (Service 1998b; 56 FR 55770).

Phyllostegia parviflora (NCN)

Phyllostegia parviflora, a member of the mint family (Lamiaceae), is a perennial herb. The species is distinguished from others of the genus by the egg-shaped to broadly egg-shaped leaves, leaf stalks usually 6 to 13.5 cm (2.4 to 5.3 in) long, and the lower corolla lip 6 to 9 mm (0.24 to 0.36 in) long. *Phyllostegia parviflora* var. *glabriuscula* has fewer glandular hairs in the inflorescence, less pubescent leaves, and usually unbranched inflorescences compared with *P. parviflora* var. *parviflora. Phyllostegia parviflora* var. *lydgatei* has shorter leaf stalks, spreading hairs on the leaf stalks, and fewer gland-tipped hairs in the inflorescence. At the time of listing of this species, only two varieties were recognized, *glabriuscula* and *parviflora.* Subsequent to the final rule listing this species in 1996, Wagner's (1999) taxonomic treatment of this group reorganized *P. parviflora* var. *lydgatei* as distinct from *P. parviflora* var. *parviflora.* Wagner's (1999) treatment is cited in the revised edition of the Manual of the Flowering Plants of Hawaii as the basis for recognizing *P. parviflora* var. *lydgatei* (Wagner *et al.* 1999). This name change will be addressed in a future **Federal Register** notice.

Historically *Phyllostegia parviflora* was known from three islands, Oahu, Hawaii, and Maui. This species is now known only from two occurrences on Oahu (HINHP Database 2001; GDSI 2001; Service 1999; 61 FR 53108).

Nothing is known of the preferred habitat of or native plant species associated with *Phyllostegia parviflora* on the island of Maui (Service 1999; 61 FR 53108; R. Hobdy, pers. comm., 2001) or of the threats to *Phyllostegia parviflora* on the island of Maui (Service 1999; 61 FR 53108).

Plantago princeps (Laukahi kuahiwi)

Plantago princeps, a short-lived member of the plantain family (Plantaginaceae), is a small shrub or robust 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, vars. *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).

Individuals of this species have been observed in fruit from April through September. Little else is known about the life history of *Plantago princeps.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1999; 59 FR 56333).

Plantago princeps was historically found on Kauai, Oahu, Molokai, Maui, and Hawaii. It is no longer extant on the island of Hawaii. Only one of the four varieties is on Maui; *Plantago princeps* var. *laxiflora* is known from Molokai

and Maui. On Maui, there are 8 occurrences of *P. princeps* var. *laxiflora,* with a total of 118 individuals, on Federal (Haleakala National Park) and privately owned lands within the East Maui Watershed Partnership. This variety is found at Kahoolewa Ridge, Nakalaloa Stream, Iao Valley near the Needle, Hanakauhi, the west side of Kaupo Gap, and Palikea Stream (GDSI 2001; HINHP Database 2001; Service 1999; 59 FR 56333).

On Maui, *Plantago princeps* var. *laxiflora* is typically found on basalt cliffs that are windblown with little vegetation in *Metrosideros polymorpha* lowland wet forest; or *Acacia koa-M. polymorpha* montane wet forest; or *M. polymorpha* montane wet shrubland at elevations between 281 and 2,539 m (922 and 8,329 ft) and containing one or more of the following associated native plant species: *Bidens micrantha* ssp. *kalealaha; Chamaesyce celastroides; Cyanea* spp.; or *Dryopteris* spp. and various other ferns, such as *Dubautia menziesii, Dubautia plantaginea* ssp. *humilis, Eragrostis variabilis, Hedyotis formosa, Leptecophylla tameiameiae, Melicope ovalis, Perrottetia sandwicensis, Pipturus albidus,* or *Touchardia latifolia* (HINHP Database 2001; Service 1999; 59 FR 56333; R. Hobdy, pers. comm., 2001).

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

Platanthera holochila (NCN)

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 on the Hawaiian Islands. It is distinguished from other Hawaiian orchids by its underground tubers that lack roots at the nodes or pseudo bulbs, and the shape and length of its dorsal sepal (Wagner *et al.* 1999).

Little is known about the life history of *Platanthera holochila.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1999; 61 FR 53108).

Historically, *Platanthera holochila* was known from Maui, Oahu, Molokai, and Kauai. Currently, *P. holochila* is extant on Kauai, Molokai, and Maui. On Maui, 5 occurrences with 22 individuals are reported on State (West Maui Forest Reserve) and privately owned lands within the West Maui Mountains Watershed Partnership and the East Maui Watershed Partnership from Kapaloa Stream, Waihee River, the border of Lahaina and Wailuku Districts and Koolau Gap (GDSI 2001; HINHP Database 2001; Service 1999; 61 FR 53108).

Platanthera holochila is found in *Metrosideros polymorpha-Dicranopteris linearis* montane wet forest or *M. polymorpha* mixed montane bog or mesic scrubby *M. polymorpha* forest at elevations between 536 and 2,314 m (1,759 and 7,592 ft) and containing one or more of the following associated native plant species: *Broussaisia arguta; Cibotium* spp.; *Clermontia* spp.; *Coprosma ernodeoides* (kukae nene); *Deschampsia nubigena; Dubautia scabra* (naenae); *Gahnia gahniiformis* (NCN); *Leptecophylla tameiameiae; Lycopodiella cernua* (wawae iole); *Luzula hawaiiensis* (wood rush); *Oreobolus furcatus; Polypodium pellucidum* (ae); *Sadleria* spp.; *Scaevola chamissoniana* (naupaka kuahiwi); *Sisyrinchium acre* (mauu laili); *Vaccinium reticulatum;* or *Wikstroemia* spp. (Service 1999; 61 FR 53108; R. Hobdy, pers. comm., 2001).

The primary threats to *Platanthera holochila* on Maui are habitat degradation and destruction by feral pigs; landslides; competition with nonnative plant species; and a risk of extinction on Maui from naturally occurring events and reduced reproductive vigor caused by the small number of remaining occurrences and individuals. Predation by slugs may also be a potential threat to this species (Service 1999; 61 FR 53108).

Pteris lidgatei (NCN)

Pteris lidgatei, a short-lived member of the maidenhair fern family (Adiantaceae), is a coarse perennial herb, 0.5 to 1 m (1.6 to 3.3 ft) tall. *Pteris lidgatei* can be distinguished from other species of *Pteris* on the Hawaiian Islands by the thick, brittle 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 1949; Wagner and Wagner 1992).

Little is known about the life history of *Pteris lidgatei.* Reproductive cycles, dispersal agents, specific environmental requirements, and limiting factors are unknown (Service 1998a; 59 FR 49025).

Historically, *Pteris lidgatei* was found on Oahu, Molokai, and at Waihee on West Maui. Currently, this species is known from Oahu and Maui. Two occurrences with approximately 20 individuals occur on Maui on State (Kahakuloa section of the West Maui NAR) and privately owned lands within the West Maui Mountains Watershed Partnership north of Eke Crater and at Kauala (GDSI 2001; HINHP Database 2001; Service 1998a; 59 FR 49025).

This species grows on steep stream banks in wet *Metrosideros polymorpha-Dicranopteris linearis* montane forest at elevations between 201 and 1,717 m (659 and 5,633 ft) and containing one or more of the following native plant species: *Christella cyatheoides; Cibotium chamissoi; Dicranopteris linearis; Elaphoglossum crassifolium* (hoe a Maui); *Sadleria squarrosa* (apuu); or *Sphenomeris chinensis* (palaa) (HINHP Database 2001; Service 1998a; 59 FR 49025; R. Hobdy, pers. comm., 2001).

The primary threats to *Pteris lidgatei* on Maui are the nonnative plants *Ageratina adenophora, Clidemia hirta,* and *Tibouchina herbacea;* habitat destruction by feral pigs; and a risk of extinction caused by random environmental events (Service 1998a; 59 FR 49025).

Sanicula purpurea (NCN)

Sanicula purpurea, a short-lived member of the parsley family (Apiaceae), is a stout perennial herb, 8 to 36 cm (3 to 14 in) tall, arising from a massive perennial stem. 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).

Little is known about the life history of *Sanicula purpurea.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1999; 61 FR 53108).

Historically and currently, *Sanicula purpurea* is known from Oahu and West Maui. On Maui, 7 occurrences totaling 200 individuals are currently known on State (Kahakuloa and Honokawai sections of the West Maui NAR) and private lands within the West Maui Mountains Watershed Partnership north of Eke Crater and east of Kahakuloa Stream, south of Eke Crater, near Violet Lake, the ridge west of Puu Kukui, and Kahoolewa Ridge east of Puu Kukui (GSDI 2001; HINHP Database 2001; Service 1999; 61 FR 53108).

This species typically grows in open *Metrosideros polymorpha* mixed montane bogs at elevations between 1,195 and 1,764 m (3,921 and 5,787 ft) and containing one or more of the following associated plant species: *Argyroxiphium caliginis* (eke silversword); *Argyroxiphium grayanum* (green sword); *Gahnia beecheyi* (NCN);

Geranium hillebrandii (nohoanu); *Lagenifera maviensis*; *Leptecophylla tameiameiae*; *Lycopodium* spp.; *Machaerina* spp.; *Myrsine vaccinioides* (kolea); *Oreobolus furcatus*; *Plantago pachyphylla* (laukahi kuahiwi); or *Viola maviensis* (HINHP Database 2001; Service 1999; 61 FR 53108; R. Hobdy, pers. comm., 2001).

Habitat degradation by feral pigs, a risk of extinction caused by random environmental events and reduced reproductive vigor caused by the small number of existing occurrences, and slugs are the major threats to *Sanicula purpurea* (HINHP Database 2001; Service 1999; 61 FR 53108).

Schiedea hookeri (NCN)

Schiedea hookeri, a member of the pink family (Caryophyllaceae), is a sprawling or clumped perennial herb. This species is distinguished from others in this endemic Hawaiian genus by its open, hairy, and sometimes sticky inflorescence, and by the size of the capsules (Wagner *et al.* 1999).

Based on field and greenhouse observations, *Schiedea hookeri* is hermaphroditic, which means that each individual has both male and female reproductive organs. Mature fruits have been observed in June and August. *Schiedea hookeri* appears to be an outcrossing species. Under greenhouse conditions, flowers do not set fruit unless pollinated. In the field, the species is presumed to be pollinated by insects, although none have been observed. A related species, *S. lydgatei* on Molokai, is apparently pollinated by native, night-flying moths. A series of self-pollinations, intra-population crosses, and crosses among populations have demonstrated that *S. hookeri* experiences moderately strong inbreeding depression. These results indicate that reductions in population size could result in inbreeding depression among progeny, with negative consequences for the long-term persistence of this species. Individuals of *S. hookeri* appear to be long-lived, but there is no evidence of reproduction from seed under field conditions. Seedlings of *Schiedea* occurring in mesic or wet sites are apparently consumed by introduced slugs and snails, which have been observed feeding on *S. membranacea,* another mesic forest species that occurs on Kauai. In contrast to mesic forest species, *Schiedea* occurring in dry areas produce abundant seedlings following winter rains, presumably because the drier sites have fewer nonnative predators. *Schiedea hookeri* differs considerably through its range in potential for clonal growth. Plants from Kaluakauila Gulch are upright and show little potential for clonal spread. In contrast, clonal growth has been detected for individuals at Kaluaa Gulch, where the growth form is decumbent and plants apparently root at the nodes. Little else is known about the life history of *Schiedea hookeri*. Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are otherwise unknown (HINHP Database 2001; Service 1999; Weller and Sakai, unpublished data; 61 FR 53108).

Historically, *Schiedea hookeri* was known from the Waianae Mountains of Oahu and from a single fragmentary collection from Haleakala on Maui that may represent *S. menziesii* rather than *S. hookeri*. Currently, this species is known only from Oahu (Environmental Division of the Army (EDA) Database 2001; HINHP Database 2001; Service 1999; 61 FR 53108).

Nothing is known of the preferred habitat of, or native plant species associated with, *Schiedea hookeri* on the island of Maui (Service 1999; 61 FR 53108; R. Hobdy, pers. comm., 2001), and nothing is known of the threats to *Schiedea hookeri* on the island of Maui (Service 1999; 61 FR 53108).

Schiedea nuttallii (NCN)

Schiedea nuttallii, a member of the pink family (Caryophyllaceae), is a generally hairless, erect subshrub. This long-lived perennial species is distinguished from others in this endemic Hawaiian genus by its habit, length of the stem internodes, length of the inflorescence, number of flowers per inflorescence, and smaller leaves, flowers, and seeds (Wagner *et al.* 1999).

Little is known about the life history of *Schiedea nuttallii*. Based on field and greenhouse observations, it is hermaphroditic. Plants on Oahu have been under observation for 10 years, and they appear to be long-lived. *Schiedea nuttallii* appears to be an outcrossing species. Under greenhouse conditions, plants fail to set seed unless hand-pollinated, suggesting that this species requires insects for pollination. Fruits and flowers are abundant in the wet season but can be found throughout the year. Little else is known about the life history of *S. nuttallii*. Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are otherwise unknown (Service 1999; 61 FR 53108).

Historically, *Schiedea nuttallii* was known from Kauai and Oahu and was reported from Maui. Currently, it is found on Kauai, Oahu, and Molokai (GDSI 2001; HINHP Database 2001; Service 1999; 61 FR 53108).

Nothing is known of the preferred habitat of, or native plant species associated with, *Schiedea nuttallii* on the island of Maui (Service 1999; 61 FR 53108; R. Hobdy, pers. comm., 2001), and nothing is known of the threats to *Schiedea nuttallii* on the island of Maui (Service 1999; 61 FR 53108).

Sesbania tomentosa (Ohai)

Sesbania tomentosa, a short-lived perennial member of the pea family (Fabaceae), is typically a sprawling shrub, but may also be a small tree. Each compound leaf consists of 18 to 38 oblong to elliptic leaflets which are usually sparsely to densely covered with silky hairs. The flowers are salmon colored, tinged with yellow, orange-red, scarlet or, rarely, pure yellow. *Sesbania tomentosa* is the only endemic Hawaiian species in the genus, differing from the naturalized *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* has been studied by David Hopper, University of Hawaii at Manoa. His findings suggest that although many insects visit *Sesbania* flowers, the majority of successful pollination is accomplished by native bees of the genus *Hylaeus,* and that populations at Kaena Point on Oahu are probably pollinator-limited. Flowering at Kaena Point is highest during the winter-spring rains, and gradually declines throughout the rest of the year. Other aspects of the life history of *S. tomentosa* are unknown (Service 1999; 59 FR 56333).

Historically, *Sesbania tomentosa* occurred on all eight of the main Hawaiian Islands and on the northwestern Hawaiian Islands of Nihoa and Necker. Currently, *S. tomentosa* occurs on Kauai, Oahu, Molokai, Kahoolawe, Maui, Hawaii, Nihoa, and Necker. On Maui, *S. tomentosa* is known from 7 occurrences with a total of 83 individuals. The occurrences are located on State-owned and/or State-leased land (Lihau section of West Maui NAR, Hana Forest Reserve, and Kanaio Training Area), under Federal jusisdiction (Kanaio National Guard Training Area) and on privately owned land within the East Maui Watershed Partnership and West Maui Mountains Watershed Partnership at Poelua Bay, Mokolea Point, between Kahakuloa Head and Puu Kahulianapa, Mahinanui, Olowalu, and Pimoe, south of Puu Puou. 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 (GDSI 2001; HINHP Database 2001; Service 1999; 59 FR 56333; R. Hobdy *in litt.* 2000).

Sesbania tomentosa is found on windswept slopes, sea cliffs, and cinder cones in *Scaevola taccada* coastal dry shrublands at elevations between 0 and 608 m (0 and 1,993 ft) and containing one or more of the following associated native plant species: *Bidens* spp.; *Diospyros sandwicensis*; stunted *Dodonaea viscosa*; *Jacquemontia ovalifolia* ssp. *sandwicensis* (pauohiiaka); *Melanthera integrifolia*; or *Sida fallax* (HINHP Database 2001; Service 1999; 59 FR 56333; R. Hobdy, pers. comm., 2001).

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

Solanum incompletum (Popolo ku mai)

Solanum incompletum, a short-lived perennial member of the nightshade family (Solanaceae), is a woody shrub. Its stems and lower leaf surfaces are covered with prominent reddish prickles or sometimes with yellow fuzzy hairs on young plant parts and lower leaf surfaces. This species differs from other native members of the genus by being generally prickly and having loosely clustered white flowers, curved anthers about 2 mm (0.08 in) long, and berries 1 to 2 cm (0.4 to 0.8 in) in diameter (Symon 1999).

Little is known about the life history of *Solanum incompletum*. Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1999; 59 FR 56333).

Historically, *Solanum incompletum* was known from Lanai, scattered locations on Maui, and the island of Hawaii. According to David Symon (1999), the known distribution of *S. incompletum* also extended to the islands of Kauai and Molokai. Currently, *S. incompletum* is only known from the island of Hawaii (HINHP Database 2001; Service 1999; 59 FR 56333).

Nothing is known of the preferred habitat of, or native plant species associated with, *Solanum incompletum* on the island of Maui (Service 1999; 59 FR 56333; R. Hobdy, pers. comm., 2001), and nothing is known of the threats to *Solanum incompletum* on the island of Maui (Service 1999; 59 FR 56333).

Spermolepis hawaiiensis (NCN)

Spermolepis hawaiiensis, a member of the parsley family (Apiaceae), is a slender annual herb with few branches. Its leaves are dissected into narrow, lance-shaped divisions. *Spermolepis hawaiiensis* is the only member of the genus native to Hawaii. It is distinguished from other native members of the family by being a non-succulent annual with an umbrella-shaped inflorescence (Constance and Affolter 1999).

Little is known about the life history of *Spermolepis hawaiiensis*. Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1999; 59 FR 56333).

Historically, *Spermolepis hawaiiensis* was known from the islands of Kauai, Oahu, Lanai, and Hawaii. Currently, it is extant on Kauai, Oahu, Molokai, Lanai, Maui, and Hawaii. On Maui, there are five known occurrences with hundreds to thousands of individuals on State (Lihau section of West Maui NAR and Kanaio NAR) and privately owned lands within the West Maui Mountains Watershed Partnership in Puu Hipa, south of Kanaha Stream, Olowalu, and Kanaio (GDSI 2001; HINHP Database 2001; Service 1999; 59 FR 56333; Charles Chimera, USGS-BRD, pers. comm., 2000).

Spermolepis hawaiiensis on Maui is known from shady spots in *Dodonaea viscosa* lowland dry shrubland at elevations between 221 and 742 m (725 and 2,434 ft) and containing one or more of the following associated native species: *Diospyros* spp.; *Eragrostis variabilis*; *Erythrina sandwicensis*; *Gouania hillebrandii*; *Heteropogon contortus*; *Melanthera lavarum*; *Myoporum sandwicense*; *Pleomele* spp.; *Santalum ellipticum*; *Sida fallax*; or *Wikstroemia* spp. (HINHP Database 2001; Service 1999; 59 FR 56333; C. Chimera, pers. comm., 2000; R. Hobdy, pers. comm., 2001).

The primary threats to *Spermolepis hawaiiensis* on Maui are habitat degradation by feral goats, pigs, cattle, and axis deer; competition with various nonnative plants, such as *Lantana camara* and *Melinis repens*; fire; erosion, landslides, and rock slides caused by natural weathering, which result in the death of individual plants as well as habitat destruction (Service 1999; 59 FR 56333).

Tetramolopium arenarium (NCN)

Tetramolopium arenarium is a short-lived perennial and an upright, branched shrub in the sunflower family (Asteraceae). Alternate leaves are lance-shaped, hairy, glandular, and gray-green. This species is separated from other species of the genus in the Hawaiian Islands by several characters: Upright habit; number of heads per flower cluster; presence and type of glands and hairs; size of male ray flowers; number and color of bisexual disk flowers; and fruit shape and pubescence. Three infra-specific taxa are recognized: *Tetramolopium arenarium* ssp. *arenarium* var. *arenarium* (from Maui and Hawaii); *T. arenarium* ssp. *arenarium* var. *confertum* (from Hawaii); and *T. arenarium* ssp. *laxum* (from Maui). These taxa are distinguished by a combination of characters. *Tetramolopium arenarium* ssp. *arenarium* var. *confertum* and *T. arenarium* ssp. *laxum* have not been seen the late 1800s (Lowrey 1999).

Little is known about the life history of *Tetramolopium arenarium*. Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1996a; 59 FR 10305).

Tetramolopium arenarium was historically known from the islands of Maui and Hawaii. The species was considered extinct until *T. arenarium* ssp. *arenarium* var. *arenarium* was recently rediscovered on the island of Hawaii. Both subspecies were last seen on Maui in the late 1800s (GDSI 2001; HINHP Database 2001; Service 1996a; 59 FR 10305).

Nothing is known about the preferred habitat of or native species associated with *Tetramolopium arenarium* on Maui (Service 1996a; 59 FR 10305; R. Hobdy, pers. comm., 2001), and nothing is known of the threats to *Tetramolopium arenarium* on the island of Maui (Service 1996a; 59 FR 10305).

Tetramolopium remyi (NCN)

Tetramolopium remyi, a short-lived perennial member of the sunflower family (Asteraceae), is a many branched, decumbent (reclining, with the end ascending) or occasionally erect shrub up to about 38 cm (15 in) tall. The stems, leaves, flower bracts, and fruit are covered with sticky hairs. *Tetramolopium remyi* has the largest flower heads in the genus. Two other

species of the genus are known historically from Lanai, but both have purplish rather than yellow disk florets and from 4 to 60 rather than one flower head per branch (Lowrey 1999).

Tetramolopium remyi flowers between April and January. Field observations suggest that the population size of the species can be profoundly affected by variability in annual precipitation. The adult plants may succumb to prolonged drought, but apparently there is a seedbank in the soil that can replenish the population during favorable conditions. Such seed banks are of great importance for arid-dwelling plants to allow populations to persist through adverse conditions. Success in greenhouse cultivation of these plants with much higher water availability implies that, although these plants are drought-tolerant, perhaps the dry conditions in which they currently exist are not optimum. Individual plants are probably not long-lived. Pollination is hypothesized to be by butterflies, bees, or flies. Seed dispersal agents, specific environmental requirements, and other limiting factors of this species are unknown (Service 1995b; 56 FR 47686).

Historically, the species was known from the Lahaina area of West Maui and Lanai. Currently, *Tetramolopium remyi* is known from two occurrences on Lanai. It was last seen on Maui in 1944 until relocated in 2001 by Joel Lau of HINHP on State-owned land with an unknown number of plants in the Kuia area (GDSI 2001; HINHP Database 2001; Service 1995b; 56 FR 47686).

On Maui, *Tetramolopium remyi* occurs in lowland dry shrubland on dry, exposed ridges or flats at elevations between 52 and 550 m (171 and 1,804 ft). Associated plant species include *Bidens mauiensis, Bidens menziesii, Dodonaea viscosa, Eragrostis atropioides* (lovegrass), *Heteropogon contortus, Lipochaeta heterophylla* (NCN), or *Waltheria indica* (Service 1995b; 56 FR 47686; R. Hobdy, pers. comm., 2001).

Nothing is known of the threats to *Tetramolopium remyi* on the island of Maui (Service 1995b; 56 FR 47686).

Vigna o-wahuensis (NCN)

Vigna o-wahuensis, a member of the pea family (Fabaceae), is a slender, twining, short-lived perennial herb with fuzzy stems. Each leaf is made up of three leaflets which vary in shape from round to linear. 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).

Little is known about the life history of *Vigna o-wahuensis.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1999; 59 FR 56333).

Historically, *Vigna o-wahuensis* was known from Niihau, Oahu, East Maui in Makawao, Waiakoa, and Haleakala, and at an unspecified site on West Maui. Currently, *V. o-wahuensis* is known from the islands of Molokai, Lanai, Kahoolawe, Maui, and Hawaii. On the State-owned island of Kahoolawe, there is one occurrence with an unknown number of individuals in the Makaalae/Lua Kealialalo area. On Maui, there is a single occurrence of at least one individual on State-owned land at Kamanamana (GDSI 2001; HINHP Database 2001; Service 1999; 59 FR 56333; C. Chimera, pers. comm., 2000).

On Kahoolawe and Maui, *Vigna o-wahuensis* occurs in dry to mesic grassland and shrubland at elevations between 0 and 50 m (0 and 164 ft) and containing one or more of the following associated plant species: *Chamaesyce* spp.; *Chenopodium* spp.; or *Sida fallax* (HINHP Database 2001; Service 1999; 59 FR 56333; R. Hobdy, pers. comm., 2001).

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

Zanthoxylum hawaiiense (Ae)

Zanthoxylum hawaiiense, a long-lived perennial, is a medium-sized tree with pale to dark gray bark and lemon-scented leaves in the rue family (Rutaceae). *Zanthoxylum hawaiiense* is distinguished from other Hawaiian members of the genus by several characters: Three leaflets all of similar size, one joint on the lateral leaf stalk, and sickle-shaped fruits with a rounded tip (Stone *et al.* 1999).

Little is known about the life history of *Zanthoxylum hawaiiense.* Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1996a; 59 FR 10305).

Historically, *Zanthoxylum hawaiiense* was known from the islands of Kauai, Molokai, Lanai, Hawaii, and the southern and southwestern slopes of Haleakala on Maui. Currently, *Z. hawaiiense* is extant on the islands of Kauai, Molokai, Maui, and Hawaii. This species is found on Maui in 9 occurrences with a total of 11 individuals on private and State (Makawao Forest Reserve and DHHL) lands at Kahakapao, and in the Hana District, north and south of the Jeep Trail and north of the Kula Pipeline (GDSI 2001; HINHP Database 2001; Service 1996a; 59 FR 10305).

Zanthoxylum hawaiiense on Maui is reported from open lowland dry or mesic *Nestegis sandwicensis-Pleomele auwahiensis* forests, *Acacia koa-Pleomele auwahiensis* forest, or montane dry forest at elevations between 869 and 1,540 m (2,852 and 5,051 ft) and containing one or more of the following associated native species: *Alectryon macrococcus; Alphitonia ponderosa; Charpentiera* spp.; *Diospyros sandwicensis; Dodonaea viscosa; Melicope* spp.; *Metrosideros polymorpha; Myrsine lanaiensis; Osteomeles anthyllidifolia; Pisonia* spp. (papala kepau); *Santalum ellipticum; Sophora chrysophylla; Streblus pendulinus;* or *Xylosma hawaiiense* (HINHP Database 2001; Service 1996a; 59 FR 10305; R. Hobdy, pers. comm., 2001).

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

A summary of occurrences and land ownership for the 70 plant species reported from the islands of Maui and Kahoolawe is given in Table 2.

TABLE 2.—SUMMARY OF EXISTING OCCURRENCES AND LAND OWNERSHIP FOR 70 SPECIES REPORTED FROM MAUI AND KAHOOLAWE

Species	Number of current occurrences	Land ownership		
		Federal	State	Private
Acaena exigua	0			
Adenophorus periens	0			
Alectryon macrococcus	13		X	X
Argyroxiphium sandwicense ssp. *macrocephalum*	7	X*		X
Asplenium fragile var. *insulare*	2	X*		X
Bidens micrantha ssp. *kalealaha*	4	X*	X	
Bonamia menziesii	6		X	X
Brighamia rockii	0			
Cenchrus agrimonioides	1		X	
Centaurium sebaeoides	3		X	X
Clermontia lindseyana	2		X	X
Clermontia oblongifolia ssp. *mauiensis*	1			
Clermontia peleana	0			
Clermontia samuelii	7	X*	X	
Colubrina oppositifolia	1			X
Ctenitis squamigera	12		X	X
Cyanea copelandii ssp. *haleakalaensis*	5	X*	X	X
Cyanea glabra	1			X
Cyanea grimesiana ssp. *grimesiana*	2			X
Cyanea hamatiflora ssp. *hamatiflora*	9	X*	X	X
Cyanea lobata	5			X
Cyanea mceldowneyi	11		X	X
Cyrtandra munroi	5		X	X
Delissea undulata	0			
Diellia erecta	5		X	X
Diplazium molokaiense	4		X	X
Dubautia plantaginea ssp. *humilis*	2			X
Flueggea neowawraea	4		X	X
Geranium arboreum	12		X	X
Geranium multiflorum	13	X*	X	X
Gouania vitifolia	0			
Hedyotis coriacea	1		X	
Hedyotis mannii	1			X
Hesperomannia arborescens	4		X	X
Hesperomannia arbuscula	8			X
Hibiscus brackenridgei	5		X	X
Ischaemum byrone	6		X	X
Isodendrion pyrifolium	0			
Kanaloa kahoolawensis	1		X	
Lipochaeta kamolensis	1		X	
Lysimachia lydgatei	4		X	X
Mariscus pennatiformis	2		X	
Melicope adscendens	16		X	X
Melicope balloui	3	X*		X
Melicope knudsenii	4		X	X
Melicope mucronulata	1			X
Melicope ovalis	2	X*		
Neraudia sericea	5		X	X
Nototrichium humile	0			
Peucedanum sandwicense	3		X	X
Phlegmariurus mannii	7	X*	X	X
Phyllostegia mannii	0			
Phyllostegia mollis	1		X	
Phyllostegia parviflora	0			
Plantago princeps	8	X*		X
Platanthera holochila	5		X	X
Pteris lidgatei	2		X	X
Remya mauiensis	5		X	
Sanicula purpurea	7		X	X
Schiedea haleakalensis	2	X*		
Schiedea hookeri	0			
Schiedea nuttallii	0			
Sesbania tomentosa	6	X**	X	X
Solanum incompletum	0			
Spermolepis hawaiiensis	5		X	X
Tetramolopium arenarium	0			
Tetramolopium capillare	5		X	X
Tetramolopium remyi	1		X	
Vigna o-wahuensis	2		X	

TABLE 2.—SUMMARY OF EXISTING OCCURRENCES AND LAND OWNERSHIP FOR 70 SPECIES REPORTED FROM MAUI AND KAHOOLAWE—Continued

Species	Number of current occurrences	Land ownership		
		Federal	State	Private
Zanthoxylum hawaiiense	9		X	X

* Haleakala National Park Lands.
** Kanaio Army National Guard Lands.

Previous Federal Action

Federal action on these plants began as a result of section 12 of the Endangered Species Act of 1973, as amended (Act) (16 U.S.C. 1531 *et seq.*), which directed the Secretary of the Smithsonian Institution to prepare a report on plants considered to be endangered, threatened, or extinct in the United States. This report, designated as House Document No. 94–51, was presented to Congress on January 9, 1975. In that document, *Alectryon macrococcus* (as *Alectryon macrococcum* var. *macrococcum* and *Alectryon mahoe*), *Bonamia menziesii*, *Brighamia rockii*, *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. *ovatifolium*, and var. *superbum*), *Hedyotis mannii* (as *Hedyotis thyrsoidea var. thyrsoidea*), *Hesperomannia arborescens* (as *Hesperomannia arborescens* var. *bushian*a 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*), *Nototrichium humile*, *Peucedanum sandwicense* (as *Peucedanum kauaiense*), *Phyllostegia mollis, Plantago princeps* (as *Plantago princeps* var. *elata*, var. *laxiflora,* var. *princeps*), *Remya mauiensis*, *Sesbania tomentosa* (as *Sesbania hobdyi* and *Sesbania tomentosa* var. *tomentosa*), *Vigna o-wahuensis* (as *Vigna sandwicensis* var. *heterophylla* and var. *sandwicensis*), and *Zanthoxylum hawaiiense* (as *Zanthoxylum hawaiiense* var. *citriodora*), 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 *Asplenium fragile* var. *insulare* (as *Asplenium fragile*), *Bidens micrantha* ssp. *kalealaha* (as *Bidens distans* and *Bidens micrantha* ssp. *kalealaha*), *Ctenitis squamigera*, *Diplazium molokaiense*, *Gouania vitifolia*, *Hedyotis coriacea*, *Isodendrion pyrifolium*, *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*, *Tetramolopium arenarium* (as *Tetramolopium arenarium* var. *arenarium*, var. *confertum*, and var. *dentatum*), *Tetramolopium capillare*, and *Tetramolopium remyi* were considered extinct. On July 1, 1975, we published a notice in the **Federal Register** (40 FR 27823) of our acceptance of the Smithsonian report as a petition within the context of section 4(c)(2) (now section 4(b)(3)) of the Act, and gave notice of our intention to review the status of the plant taxa named therein. As a result of that review, on June 16, 1976, we published a proposed rule in the **Federal Register** (41 FR 24523) to determine endangered status pursuant to section 4 of the Act for approximately 1,700 vascular plant taxa, including all of the above taxa except *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 (40 FR 27823).

General comments received in response to the 1976 proposal were summarized in an April 26, 1978, **Federal Register** publication (43 FR 17909). In 1978, amendments to the Act required that all proposals over two years old be withdrawn. A 1-year grace period was given to proposals already over two years old. On December 10, 1979, we published a notice in the **Federal Register** (44 FR 70796) withdrawing the portion of the June 16, 1976, proposal that had not been made final, along with four other proposals that had expired. We published updated Notices of Review for plants on December 15, 1980 (45 FR 82479), September 27, 1985 (50 FR 39525), February 21, 1990 (55 FR 6183), September 30, 1993 (58 FR 51144), and February 28, 1996 (61 FR 7596). We listed the 70 species as endangered or threatened between 1991 and 1999. A summary of the listing actions can be found in Table 3(a).

TABLE 3(a).—SUMMARY OF LISTING ACTIONS FOR 70 PLANT SPECIES FROM MAUI AND KAHOOLAWE

Species	Federal status	Proposed listing rule		Final listing rule	
		Date	Federal Register	Date	Federal Register
Acaena exigua	E	05/24/91	56 FR 23842	05/15/92	57 FR 20772
Adenophorus periens	E	09/14/93	58 FR 48012	11/10/94	59 FR 56333
Alectryon macrococcus	E	05/24/91	56 FR 23842	05/15/92	57 FR 20772
Argyroxiphium sandwicense ssp. *macrocephalum*	T	05/24/91	56 FR 23842	05/15/92	57 FR 20772
Asplenium fragile var. *insulare*	E	06/24/93	58 FR 34231	09/09/94	59 FR 49025
Bidens micrantha ssp. *kalealaha*	E	05/24/91	56 FR 23842	05/15/92	57 FR 20772
Bonamia menziesii	E	09/14/93	58 FR 48012	11/10/94	59 FR 56333

TABLE 3(a).—SUMMARY OF LISTING ACTIONS FOR 70 PLANT SPECIES FROM MAUI AND KAHOOLAWE—Continued

Species	Federal status	Proposed listing rule		Final listing rule	
		Date	Federal Register	Date	Federal Register
Brighamia rockii	E	09/20/91	56 FR 47718	10/08/92	57 FR 46325
Cenchrus agrimonioides	E	10/02/95	60 FR 51417	10/10/96	61 FR 53108
Centaurium sebaeoides	E	09/28/90	55 FR 39664	10/29/91	56 FR 55770
Clermontia lindseyana	E	12/17/92	57 FR 59951	03/04/94	59 FR 10305
Clermontia oblongifolia ssp. *mauiensis*	E	05/24/91	56 FR 23842	05/15/92	57 FR 20772
Clermontia peleana	E	12/17/92	57 FR 59951	03/04/94	59 FR 10305
Clermontia samuelii	E	05/15/97	62 FR 26757	09/03/99	64 FR 48307
Colubrina oppositifolia	E	12/17/92	57 FR 59951	03/04/94	59 FR 10305
Ctenitis squamigera	E	06/24/93	58 FR 34231	09/09/94	59 FR 49025
Cyanea copelandii ssp. *haleakalaensis*	E	05/15/97	62 FR 26757	09/03/99	64 FR 48307
Cyanea glabra	E	05/15/97	62 FR 26757	09/03/99	64 FR 48307
Cyanea grimesiana ssp. *grimesiana*	E	10/02/95	60 FR 51417	10/10/96	61 FR 53108
Cyanea hamatiflora ssp. *hamatiflora*	E	05/15/97	62 FR 26757	09/03/99	64 FR 48307
Cyanea lobata	E	05/24/91	56 FR 23842	05/15/92	57 FR 20772
Cyanea mceldowneyi	E	05/24/91	56 FR 23842	05/15/92	57 FR 20772
Cyrtandra munroi	E	05/24/91	56 FR 23842	05/15/92	57 FR 20772
Delissea undulata	E	06/27/94	59 FR 32946	10/10/96	61 FR 53124
Diellia erecta	E	09/14/93	58 FR 48012	11/10/94	59 FR 56333
Diplazium molokaiense	E	06/24/93	58 FR 34231	09/09/94	59 FR 49025
Dubautia plantaginea ssp. *humilis*	E	05/15/97	62 FR 26757	09/03/99	64 FR 48307
Flueggea neowawraea	E	09/14/93	58 FR 48012	11/10/94	59 FR 56333
Geranium arboreum	E	01/23/91	56 FR 2490	05/13/92	57 FR 20589
Geranium multiflorum	E	05/24/91	56 FR 23842	05/15/92	57 FR 20772
Gouania vitifolia	E	12/14/92	57 FR 39066	06/27/94	59 FR 32932
Hedyotis coriacea	E	05/24/91	56 FR 23842	05/15/92	57 FR 20772
Hedyotis mannii	E	09/20/91	56 FR 47718	10/08/92	57 FR 46325
Hesperomannia arborescens	E	10/14/92	57 FR 47028	03/28/94	59 FR 14482
Hesperomannia arbuscula	E	09/28/90	55 FR 39664	10/29/91	56 FR 55770
Hibiscus brackenridgei	E	09/14/93	58 FR 48012	11/10/94	59 FR 56333
Ischaemum byrone	E	12/17/92	57 FR 59951	03/04/94	59 FR 10305
Isodendrion pyrifolium	E	12/17/92	57 FR 59951	03/04/94	59 FR 10305
Kanaloa kahoolawensis	E	05/15/97	62 FR 26757	09/03/99	64 FR 48307
Lipochaeta kamolensis	E	05/24/91	56 FR 23842	05/15/92	57 FR 20772
Lysimachia lydgatei	E	05/24/91	56 FR 23842	05/15/92	57 FR 20772
Mariscus pennatiformis	E	09/14/93	58 FR 48012	11/10/94	59 FR 56333
Melicope adscendens	E	05/11/93	58 FR 18073	12/05/94	59 FR 62346
Melicope balloui	E	05/11/93	58 FR 18073	12/05/94	59 FR 62346
Melicope knudsenii	E	10/30/91	56 FR 5562	02/25/94	59 FR 09304
Melicope mucronulata	E	05/24/91	56 FR 23842	05/15/92	57 FR 20772
Melicope ovalis	E	05/11/93	58 FR 18073	12/05/94	59 FR 62346
Neraudia sericea	E	09/14/93	58 FR 48012	11/10/94	59 FR 56333
Nototrichium humile	E	10/02/95	60 FR 51398	10/10/96	61 FR 53089
Peucedanum sandwicense	T	10/30/91	56 FR 5562	02/25/94	59 FR 09304
Phlegmariurus mannii	E	05/24/91	56 FR 23842	05/15/92	57 FR 20772
Phyllostegia mannii	E	09/20/91	56 FR 47718	10/08/92	57 FR 46325
Phyllostegia mollis	E	09/28/90	55 FR 39664	10/29/91	56 FR 55770
Phyllostegia parviflora	E	10/02/95	60 FR 51417	10/10/96	61 FR 53108
Plantago princeps	E	09/14/93	58 FR 48012	11/10/94	59 FR 56333
Platanthera holochila	E	10/02/95	60 FR 51417	10/10/96	61 FR 53108
Pteris lidgatei	E	06/24/93	58 FR 34231	09/09/94	59 FR 49025
Remya mauiensis	E	10/02/89	54 FR 40447	01/14/91	56 FR 1450
Sanicula purpurea	E	10/02/95	60 FR 51417	10/10/96	61 FR 53108
Schiedea haleakalensis	E	05/24/91	56 FR 23842	05/15/92	57 FR 20772
Schiedea hookeri	E	10/02/95	60 FR 51417	10/10/96	61 FR 53108
Schiedea nuttallii	E	10/02/95	60 FR 51417	10/10/96	61 FR 53108
Sesbania tomentosa	E	09/14/93	58 FR 48012	11/10/94	59 FR 56333
Solanum incompletum	E	09/14/93	58 FR 48012	11/10/94	59 FR 56333
Spermolepis hawaiiensis	E	09/14/93	58 FR 48012	11/10/94	59 FR 56333
Tetramolopium arenarium	E	12/17/92	57 FR 59951	03/04/94	59 FR 10305
Tetramolopium capillare	E	03/25/93	58 FR 16164	09/30/94	59 FR 49860
Tetramolopium remyi	E	09/17/90	55 FR 38236	09/20/91	56 FR 47686
Vigna o-wahuensis	E	09/14/93	58 FR 48012	11/10/94	59 FR 56333
Zanthoxylum hawaiiense	E	12/17/92	57 FR 59951	03/04/94	59 FR 10305

Key:
E= Endangered.
T= Threatened.

At the time each plant was listed, we found 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 64 plants because it would not benefit the plant or would increase the degree of threat to the species. The not prudent determinations for these species, along with others, were challenged in *Conservation Council for Hawaii* v. *Babbitt,* 2 F. Supp. 2d 1280 (D. Haw. 1998). On March 9, 1998, the United States District Court for the District of Hawaii directed us to review the prudency findings for 245 listed plant species in Hawaii, including 64 of the 70 listed species reported from Maui. Among other things, the court held that in most cases we did not sufficiently demonstrate that the species are threatened by human activity or that such threats would increase with the designation of critical habitat. The court also held that we failed to balance any risks of designating critical habitat against any benefits (*id.* at 1283–85).

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

On August 10, 1998, the court ordered us to publish proposed critical habitat designations or nondesignations for at least 100 species by November 30, 2000, and to publish proposed designations or nondesignations for the remaining 145 species by April 30, 2002 (*Conservation Council for Hawaii* v. *Babbitt,* 24 F. Supp. 2d 1074 (D. Haw. 1998)).

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 found that designation of critical habitat was prudent and stated that we would develop critical habitat designations for these six taxa, along with four others, by the time we completed 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 that it was reasonable for us to integrate these 10 Maui Nui (Maui, Lanai, Molokai, and Kahoolawe) plant taxa into the schedule established for designating critical habitat for the other 245 Hawaiian plants, but ordered us to publish proposed critical habitat designations for the 10 Maui Nui species by November 30, 2000, and to publish final critical habitat designations by November 30, 2001.

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

On December 29, 1999, we provided information to landowners on the islands of Maui and Kahoolawe, regarding our requirement to designate critical habitat for 70 plant species. This information included a copy of the November 30, 1998, **Federal Register** notice, a map showing the general locations of the species that may be on his/her property, and a handout containing general information on critical habitat. 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 with local landowners and other interested members of the public. A total of 30 people attended the two open houses. In addition, we met with Maui County DOFAW staff to discuss their management activities on Maui.

On December 18, 2000, we published the second of the court-ordered proposed critical habitat designations or nondesignations for 61 Maui and Kahoolawe plants (65 FR 79192). The proposed critical habitat designations for Kauai and Niihau plants were published on November 7, 2000 (65 FR 66808), for Molokai plants on December 29, 2000 (65 FR 83158), and for Lanai plants on December 27, 2000 (65 FR 82086). All of these proposed rules were sent to the **Federal Register** by or on November 30, 2000, as required by the court orders. In those proposals we proposed that critical habitat was prudent for 61 species (*Alectryon macrococcus, Argyroxiphium sandwicense* ssp. *macrocephalum, Adenophorus periens, Bidens micrantha* ssp. *kalealaha, Bonamia menziesii, Brighamia rockii, 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, Delissea undulata,*

Diellia erecta, Diplazium molokaiense, Dubautia plantaginea ssp. *humilis, Flueggea neowawraea, Geranium arboreum, Geranium multiflorum, Hedyotis coriacea, Hedyotis mannii, Hesperomannia arborescens, Hesperomannia arbuscula, Hibiscus brackenridgei, Ischaemum byrone, Isodendrion pyrifolium, Kanaloa kahoolawensis, Lipochaeta kamolensis, Lysimachia lydgatei, Mariscus pennatiformis, Melicope adscendens, Melicope balloui, Melicope knudsenii, Melicope mucronulata, Melicope ovalis, Neraudia sericea, Peucedanum sandwicense, Phlegmariurus mannii, Phyllostegia mannii, Phyllostegia mollis, Plantago princeps, Platanthera holochila, Pteris lidgatei, Remya mauiensis, Sanicula purpurea, Schiedea haleakalensis, Schiedea nuttallii, Sesbania tomentosa, Spermolepis hawaiiensis, Tetramolopium capillare, Tetramolopium remyi, Vigna o-wahuensis,* and *Zanthoxylum hawaiiense*) that are reported from Maui and/or Kahoolawe, as well as Kauai, Niihau, Molokai, and Lanai. We proposed that critical habitat was not prudent for one species, *Acaena exigua,* a species reported from Maui as well as Kauai, because it had not been seen recently in the wild, and no genetic material of this species was known to exist. At the time we proposed critical habitat on Maui, critical habitat was not proposed for four species, *Argyroxiphium sandwicense* ssp. *macrocephalum, Melicope balloui, Melicope ovalis,* and *Schiedea haleakalensis,* because they were found only in areas on Maui that did not require special management considerations or protection because they were already protected and managed to the benefit of these species, pursuant to 16 U.S.C. 1532(5)(A)(i). (However, a recent Federal District Court disagreed with this interpretation of the definition of critical habitat. *Center for Biological Diversity* v. *Norton,* Civ. No. 01–409 TUC DCB (D. Ariz. Jan. 13, 2003). While the Service still believes our interpretation is reasonable, we have not excluded areas from this critical habitat designation based on 16 U.S.C. 1532(5)(a)(i).)

On December 18, 2000, we proposed designation of critical habitat on approximately 13,574 ha (33,614 ac) of land on the island of Maui and 207 ha (512 ac) on the island of Kahoolawe. The publication of the proposed rule opened a 60-day public comment period, which closed on February 16, 2001. On February 22, 2001, we published a notice (66 FR 11131) announcing the reopening of the comment period until April 2, 2001, on the proposal to designate critical habitat for 50 plants from Maui and Kahoolawe and a notice of a public hearing. On March 20, 2001, we held a public hearing at the Renaissance Wailea Beach Resort, Maui.

On October 3, 2001, we submitted a joint stipulation with Earthjustice (representing the plaintiffs in *Hawaii Conservation Council* v. *Babbitt*) to the U.S. District Court requesting extension of the court order for the final rules to designate critical habitat for plants from Kauai and Niihau (July 30, 2002), Maui and Kahoolawe (August 23, 2002), Lanai (September 16, 2002), and Molokai (October 16, 2002), citing the need to revise the proposals to incorporate or address new information and comments received during the comment periods. The joint stipulation was approved and ordered by the court on October 5, 2001.

On April 3, 2002, we published a revised proposed rule for 70 listed plant species from Maui and Kahoolawe (67 FR 15856). Critical habitat for 61 (*Alectryon macrococcus, Argyroxiphium sandwicense* ssp. *macrocephalum, Asplenium fragile* var. *insulare, Bidens micrantha* ssp. *kalealaha, Bonamia menziesii, Brighamia rockii, 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, Gouania vitifolia, Hedyotis coriacea, Hedyotis mannii, Hesperomannia arborescens, Hesperomannia arbuscula, Hibiscus brackenridgei, Ischaemum byrone, Isodendrion pyrifolium, Kanaloa kahoolawensis, Lipochaeta kamolensis, Lysimachia lydgatei, Mariscus pennatiformis, Melicope adscendens, Melicope balloui, Melicope knudsenii, Melicope mucronulata, Melicope ovalis, Neraudia sericea, Nototrichium humile, Peucedanum sandwicense, Phlegmariurus mannii, Phyllostegia mannii, Phyllostegia mollis, Plantago princeps, Platanthera holochila, Pteris lidgatei, Remya mauiensis, Sanicula purpurea, Schiedea haleakalensis, Sesbania tomentosa, Spermolepis hawaiiensis, Tetramolopium capillare, Tetramolopium remyi, Vigna o-wahuensis,* and *Zanthoxylum hawaiiense*) of the 70 plant species from the islands of Maui and Kahoolawe was proposed on approximately 51,208 ha (126,531 ac) of land on Maui, and approximately 1,372 ha (4,500 ac) on Kahoolawe (67 FR 15856). We proposed that critical habitat was prudent for six species (*Clermontia peleana, Gouania vitifolia, Nototrichium humile, Phyllostegia parviflora, Schiedea hookeri,* and *Tetramolopium arenarium*) for which a prudency finding had not been made previously. Critical habitat was not proposed for *Adenophorus periens, Clermontia peleana, Delissea undulata, Phyllostegia parviflora, Schiedea hookeri, Schiedea nuttallii, Solanum incompletum,* and *Tetramolopium arenarium* on the islands of Maui and Kahoolawe because these plants no longer occur on Maui or Kahoolawe, and we were unable to identify habitat which was essential to their conservation on these islands. Critical habitat was not proposed for *Acaena exigua,* a species reported from Maui as well as Kauai because it has not been seen recently in the wild and was not known to be in storage or under propagation.

The publication of the revised proposed rule opened up a 60-day public comment period, which closed on June 3, 2002. On July 11, 2002, we submitted joint stipulations with Earthjustice to the U.S. District Court requesting extension of the court orders for the final rules to designate critical habitat for plants from Lanai (December 30, 2002), Kauai and Niihau (January 31, 2003), Molokai (February 28, 2003), Maui and Kahoolawe (April 18, 2003), Oahu (April 30, 2003), the Northwestern Hawaiian Islands (April 30, 2003), and the island of Hawaii (May 30, 2003), citing the need to conduct additional reviews of the proposals, address comments received during the public comment periods, and to conduct a series of public workshops on the proposals. The joint stipulations were approved and ordered by the court on July 12, 2002. On August 26, 2002, we published a notice (67 FR 54764) announcing a public hearing and reopening the comment period until September 30, 2002. On August 27, 2002, September 12, 2002, and September 26, 2002, we held public meetings at the Maui Arts and Cultural Center, Kahului, Maui. On October 2, 2002, we published a notice (67 FR 61845) announcing the availability of the draft economic analysis on the proposed critical habitat and reopening the public comment period until November 2, 2002.

We determined that designation of critical habitat for the multi-island species, *Acaena exigua,* was not prudent on February 27, 2003 (68 FR

9116) and explained why we believe critical habitat is prudent for the following 45 multi-island species in other published final critical habitat rules: *Adenophorus periens; Alectryon macrococcus; Bidens micrantha* ssp. *kalealaha; Bonamia menziesii; Brighamia rockii; Cenchrus agrimonioides; Centaurium sebaeoides; Clermontia oblongifolia* ssp. *mauiensis; Clermontia samuelii; Ctenitis squamigera; Cyanea copelandii* ssp. *haleakalaensis; Cyanea glabra; Cyanea grimesiana* ssp. *grimesiana; Cyanea hamatiflora* ssp. *hamatiflora; Cyanea lobata; Cyrtandra munroi; Delissea undulata; Diellia erecta; Diplazium molokaiense; Flueggea neowawraea; Hedyotis mannii; Hesperomannia arborescens; Hibiscus brackenridgei; Ischaemum byrone; Isodendrion pyrifolium; Kanaloa kahoolawensis; Mariscus pennatiformis; Melicope knudsenii; Melicope mucronulata; Neraudia sericea; Peucedanum sandwicense; Phlegmariurus mannii; Phyllostegia mannii; Phyllostegia mollis; Phyllostegia parvilfora; Plantago princeps; Platanthera holochila; Pteris lidgatei; Schiedea nuttallii; Sesbania tomentosa; Solanum incompletum; Spermolepis hawaiiensis; Tetramolopium remyi; Vigna o-wahuensis;* and *Zanthoxylum hawaiiense* (64 FR 48307, 68 FR 1220, 68 FR 9116, 68 FR 12982). A summary of the critical habitat actions can be found in Table 3(b).

TABLE 3((b).—SUMMARY OF PREVIOUS CRITICAL HABITAT ACTIONS FOR 70 PLANT SPECIES FROM MAUI AND KAHOOLAWE

Species	Proposed critical habitat		Final critical habitat prior to publication of this rule	
	Date(s)	Federal Register	Date(s)	Federal Register
Acaena exigua	12/18/2000	65 FR 79192	NA	NA
Adenophorus periens	11/07/2000	65 FR 66808	02/27/03	68 FR 9116
	12/27/2000	65 FR 82086	03/18/03	
	12/29/2000	65 FR 83158		68 FR 12982
	03/04/2002	67 FR 9806		
	04/05/2002	67 FR 16492		
	05/28/2002	67 FR 36968		
	05/28/2002	67 FR 37108		
Alectryon macrococcus	11/07/2000	65 FR 66808	02/27/03	68 FR 9116
	12/18/2000	65 FR 79192	03/18/03	68 FR 12982
	12/29/2000	65 FR 83158		
	01/28/2002	67 FR 3940		
	03/04/2002	67 FR 9806		
	04/03/2002	67 FR 15856		
	04/05/2002	67 FR 16492		
	05/28/2002	67 FR 37108		
Argyroxiphium sandwicense ssp. *macrocephalum*	12/18/2000	65 FR 79192	NA	NA
	04/03/2002	67 FR 15856		
Asplenium fragile var. *insulare*	04/03/2002	67 FR 15856	NA	NA
	05/28/2002	67 FR 36968		
Bidens micrantha ssp. *kalealaha*	12/18/2000	65 FR 79192	01/09/03	68 FR 1220
	04/03/2002	67 FR 15856		
Bonamia menziesii	11/07/2000	65 FR 66808	02/27/03	68 FR 9116
	12/18/2000	65 FR 79192	03/18/03	68 FR 12982
	12/27/2000	65 FR 82086		
	01/28/2002	67 FR 3940		
	03/04/2002	67 FR 9806		
	04/03/2002	67 FR 15856		
	04/05/2002	67 FR 16492		
	05/28/2002	67 FR 36968		
	05/28/2002	67 FR 37108		
Brighamia rockii	12/29/2000	65 FR 83158	03/18/03	68 FR 12982
	03/04/2002	67 FR 9806		
	04/03/2002	67 FR 15856		
	04/05/2002	67 FR 16492		
Cenchrus agrimonioides	03/04/2002	67 FR 9806	NA	NA
	04/03/2002	67 FR 15856		
	05/28/2002	67 FR 36968		
	05/28/2002	67 FR 37108		
Centaurium sebaeoides	11/07/2000	65 FR 66808	02/27/03	68 FR 9116
	12/18/2000	65 FR 79192	03/18/03	68 FR 12982
	12/27/2000	65 FR 82086		
	12/29/2000	65 FR 83158		
	01/28/2002	67 FR 3940		
	03/04/2002	67 FR 9806		
	04/03/2002	67 FR 15856		
	04/05/2002	67 FR 16492		
	05/28/2002	67 FR 37108		
Clermontia lindseyana	12/18/2000	65 FR 79192	NA	NA
	04/03/2002	67 FR 15856		
	05/28/2002	67 FR 36968		

TABLE 3((b).—SUMMARY OF PREVIOUS CRITICAL HABITAT ACTIONS FOR 70 PLANT SPECIES FROM MAUI AND KAHOOLAWE—Continued

Species	Proposed critical habitat		Final critical habitat prior to publication of this rule	
	Date(s)	Federal Register	Date(s)	Federal Register
Clermontia oblongifolia ssp. *mauiensis*	12/18/2000	65 FR 79192	NA	NA
	12/27/2000	65 FR 82086		
	03/04/2002	67 FR 9806		
	04/03/2002	67 FR 15856		
Clermontia peleana	05/28/2002	67 FR 36968	NA	NA
Clermontia samuelii	12/18/2000	65 FR 79192	NA	NA
	04/03/2002	67 FR 15856		
Colubrina oppositifolia	12/18/2000	65 FR 79192	NA	NA
	04/03/2002	67 FR 15856		
	05/28/2002	67 FR 36968		
	05/28/2002	67 FR 37108		
Ctenitis squamigera	12/18/2000	65 FR 79192	02/27/03	68 FR 9116
	12/27/2000	65 FR 82086	03/18/03	68 FR 12982
	12/29/2000	65 FR 83158		
	01/28/2002	67 FR 3940		
	03/04/2002	67 FR 9806		
	04/05/2002	67 FR 16492		
	05/28/2002	67 FR 37108		
Cyanea copelandii ssp. *haleakalaensis*	12/18/2000	65 FR 79192	NA	NA
	04/03/2002	67 FR 15856		
Cyanea glabra	12/18/2000	65 FR 79192	NA	NA
	04/03/2002	67 FR 15856		
Cyanea grimesiana ssp. *grimesiana*	12/18/2000	65 FR 79192	03/18/03	68 FR 12982
	12/27/2000	65 FR 82086		
	12/29/2000	65 FR 83158		
	03/04/2002	67 FR 9806		
	04/03/2002	67 FR 15856		
	04/5/2002	67 FR 16492		
	05/28/2002	67 FR 37108		
Cyanea hamatiflora ssp. *hamatiflora*	12/18/2002	65 FR 79192	NA	NA
	04/03/2002	67 FR 15856		
Cyanea lobata	12/18/2000	65 FR 79192	NA	NA
	03/04/2002	67 FR 9806		
	04/03/2002	67 FR 15856		
Cyanea mceldowneyi	12/18/2000	65 FR 79192	NA	NA
	04/03/2002	67 FR 15856		
Cyrtandra munroi	12/18/2000	65 FR 79192	NA	NA
	12/27/2000	65 FR 82086		
	03/04/2002	67 FR 9806		
	04/03/2002	67 FR 15856		
Delissea undulata	11/07/2000	65 FR 66808	02/27/03	68 FR 9116
	01/28/2002	67 FR 3940		
	05/28/2002	67 FR 36968		
Diellia erecta	12/18/2000	65 FR 79192	02/27/03	68 FR 9116
	12/29/2000	65 FR 83158	03/18/03	68 FR 12982
	01/28/2002	67 FR 3940		
	03/04/2002	67 FR 9806		
	04/03/2002	67 FR 15856		
	04/05/2002	67 FR 16492		
	05/28/2002	67 FR 36968		
	05/28/2002	67 FR 37108		
Diplazium molokaiense	12/18/2000	65 FR 79192	02/27/03	68 FR 9116
	01/28/2002	67 FR 3940	03/18/03	68 FR 12982
	03/04/2002	67 FR 9806		
	04/03/2002	67 FR 15856		
	04/05/2002	67 FR 16492		
	05/28/2002	67 FR 37108		
Dubautia plantaginea ssp. *humilis*	12/18/2000	65 FR 79192	NA	NA
	04/04/2002	67 FR 15856		
Flueggea neowawraea	11/07/2000	65 FR 66808	02/27/03	68 FR 9116
	12/18/2000	65 FR 79192	03/18/03	68 FR 12982
	01/28/2002	67 FR 3940		
	04/03/2002	67 FR 15856		
	04/05/2002	67 FR 16492		
	05/28/2002	67 FR 36968		
	05/28/2002	67 FR 37108		

TABLE 3((b).—SUMMARY OF PREVIOUS CRITICAL HABITAT ACTIONS FOR 70 PLANT SPECIES FROM MAUI AND KAHOOLAWE—Continued

Species	Proposed critical habitat		Final critical habitat prior to publication of this rule	
	Date(s)	Federal Register	Date(s)	Federal Register
Geranium arboreum	12/18/2000	65 FR 79192	NA	NA
	04/04/2002	67 FR 15856		
Geranium multiflorum	12/18/2000	65 FR 79192	NA	NA
	04/04/2002	67 FR 15856		
Gouania vitifolia	04/03/2002	67 FR 15856	NA	NA
	05/28/2002	67 FR 36968		
	05/28/2002	67 FR 37108		
Hedyotis coriacea	12/18/2000	65 FR 79192	NA	NA
	04/03/2002	67 FR 15856		
	05/28/2002	67 FR 36968		
	05/28/2002	67 FR 37108		
Hedyotis mannii	12/18/2000	65 FR 79192	NA	NA
	12/27/2000	65 FR 82086		
	12/29/2000	65 FR 83158		
	03/04/2002	67 FR 9806		
	04/03/2002	67 FR 15856		
	04/05/2002	67 FR 16492		
Hesperomannia arborescens	12/18/2000	65 FR 79192	03/18/03	68 FR 12982
	12/29/2000	65 FR 83158		
	03/04/2002	67 FR 9806		
	04/03/2002	67 FR 15856		
	04/05/2002	67 FR 16492		
	05/28/2002	67 FR 37108		
Hesperomannia arbuscula	12/18/2000	65 FR 79192	NA	NA
	04/03/2002	67 FR 15856		
	05/28/2002	67 FR 37108		
Hibiscus brackenridgei	12/18/2000	65 FR 79192	02/27/03	68 FR 9116
	12/27/2000	65 FR 82086	03/18/03	68 FR 12982
	03/04/2002	67 FR 9806		
	04/03/2002	67 FR 15856		
	04/05/2002	67 FR 16492		
	05/28/2002	67 FR 36968		
	05/28/2002	67 FR 37108		
Ischaemum byrone	12/18/2000	65 FR 79192	02/27/03	68 FR 9116
	12/29/2000	65 FR 83157	03/18/03	68 FR 12982
	01/28/2002	67 FR 3940		
	04/03/2002	67 FR 15856		
	04/05/2002	67 FR 16492		
	05/28/2002	67 FR 36968		
Isodendrion pyrifolium	01/28/2002	67 FR 3940	03/18/03	68 FR 12982
	03/04/2002	67 FR 9806		
	04/03/2002	67 FR 15856		
	04/05/2002	67 FR 16492		
	05/28/2002	67 FR 36968		
	05/28/2002	67 FR 37108		
Kanaloa kahoolawensis	12/18/2000	65 FR 79192	NA	NA
	04/03/2002	67 FR 15856		
Lipochaeta kamolensis	12/18/2000	65 FR 79192	NA	NA
	04/03/2002	67 FR 15856		
Lysimachia lydgatei	12/18/2000	65 FR 79192	NA	NA
	04/03/2002	67 FR 15856		
Mariscus pennatiformis	12/18/2000	65 FR 79192	02/27/03	68 FR 9116
	01/28/2002	67 FR 3940		
	04/03/2002	67 FR 15856		
	05/14/2002	67 FR 34522		
	05/28/2002	67 FR 37108		
Melicope adscendens	12/18/2000	65 FR 79192	NA	NA
	04/03/2002	67 FR 15856		
Melicope balloui	12/18/2000	65 FR 79192	NA	NA
	04/03/2002	67 FR 15856		
Melicope knudsenii	11/07/2000	65 FR 66808	02/27/03	68 FR 9116
	12/18/2000	65 FR 79192		
	01/28/2002	67 FR 3940		
	04/03/2002	67 FR 15856		

TABLE 3((b).—SUMMARY OF PREVIOUS CRITICAL HABITAT ACTIONS FOR 70 PLANT SPECIES FROM MAUI AND KAHOOLAWE—Continued

Species	Proposed critical habitat		Final critical habitat prior to publication of this rule	
	Date(s)	Federal Register	Date(s)	Federal Register
Melicope mucronulata	12/18/2000	65 FR 79192	03/18/03	68 FR 12982
	12/29/2000	65 FR 83158		
	04/03/2002	67 FR 15856		
	04/05/2002	67 FR 16492		
Melicope ovalis	12/18/2000	65 FR 79192	NA	NA
	04/03/2002	67 FR 15856		
Neraudia sericea	12/18/2000	65 FR 79192	03/18/03	68 FR 12982
	12/29/2000	65 FR 83158		
	03/04/2002	67 FR 9806		
	04/03/2002	67 FR 15856		
	04/05/2002	67 FR 16492		
Nototrichium humile	04/03/2002	66 FR 79192	NA	NA
	05/28/2002	67 FR 37108		
Peucedanum sandwicense	11/07/2000	65 FR 66808	02/27/03	68 FR 9116
	12/18/2000	65 FR 79192	03/18/03	68 FR 12982
	12/29/2000	65 FR 83158		
	01/28/2002	67 FR 3940		
	04/03/2002	67 FR 15856		
	04/05/2002	67 FR 16492		
	05/28/2002	67 FR 37108		
Phlegmariurus mannii	12/18/2000	65 FR 79192	NA	NA
	04/03/2002	67 FR 15856		
Phyllostegia mannii	04/03/2002	67 FR 15856	03/18/03	68 FR 12982
	04/05/2002	67 FR 16492		
Phyllostegia mollis	12/18/2000	65 FR 79192		
	04/03/2002	67 FR 15856		
	04/05/2002	67 FR 16492		
	05/28/2002	67 FR 37108		
Phyllostegia parviflora	05/28/2002	67 FR 37108	NA	NA
Plantago princeps	11/07/2000	65 FR 66808	02/27/03	68 FR 9116
	12/18/2000	65 FR 79192	03/18/03	68 FR 12982
	12/29/2000	65 FR 83158		
	01/28/2002	67 FR 3940		
	04/03/2002	67 FR 15856		
	04/05/2002	67 FR 16492		
	05/28/2002	67 FR 37108		
Platanthera holochila	11/07/2000	65 FR 66808	02/27/03	68 FR 9116
	12/18/2000	65 FR 79192		
	12/29/2000	65 FR 83158		
	01/28/2002	67 FR 3940		
	04/03/2002	67 FR 15856		
	04/05/2002	67 FR 16492		
	05/28/2002	67 FR 37108		
Pteris lidgatei	12/18/2000	65 FR 79192	03/18/03	68 FR 12982
	04/03/2002	67 FR 15856		
	04/05/2002	67 FR 16492		
	05/28/2002	67 FR 37108		
Remya mauiensis	12/18/2000	65 FR 79192	NA	NA
	04/03/2002	67 FR 15856		
Sanicula purpurea	12/18/2000	65 FR 79192	NA	NA
	04/03/2002	67 FR 15856		
	05/28/2002	67 FR 37108		
Schiedea haleakalensis	12/18/2000	65 FR 79192	NA	NA
	04/03/2002	67 FR 15856		
Schiedea hookeri	05/28/2002	67 FR 37108	NA	NA
Schiedea nuttallii	12/29/2000	65 FR 83158	03/18/03	68 FR 12982
	04/05/2002	67 FR 16492		
Sesbania tomentosa	11/07/2000	65 FR 66808	02/27/03	68 FR 9116
	12/18/2000	65 FR 79192	03/18/03	68 FR 12982
	12/29/2000	65 FR 83158		
	01/28/2002	67 FR 3940		
	03/04/2002	67 FR 9806		
	04/03/2002	67 FR 15856		
	04/05/2002	67 FR 16492		
	05/14/2002	67 FR 34522		
	05/28/2002	67 FR 36968		
	05/28/2002	67 FR 37108		

TABLE 3((b).—SUMMARY OF PREVIOUS CRITICAL HABITAT ACTIONS FOR 70 PLANT SPECIES FROM MAUI AND KAHOOLAWE—Continued

Species	Proposed critical habitat		Final critical habitat prior to publication of this rule	
	Date(s)	Federal Register	Date(s)	Federal Register
Solanum incompletum	01/28/2002	67 FR 3940	03/18/03	68 FR 12982
	04/05/2002	67 FR 16492		
Spermolepis hawaiiensis	11/07/2000	65 FR 66808	02/27/03	68 FR 9116
	12/18/2000	65 FR 79192	03/18/03	68 FR 12982
	12/27/2000	65 FR 82086		
	12/29/2000	65 FR 83158		
	01/28/2002	67 FR 3940		
	03/04/2002	67 FR 9806		
	04/03/2002	67 FR 15856		
	04/05/2002	67 FR 16492		
	05/28/2002	67 FR 36968		
	05/28/2002	67 FR 37108		
Tetramolopium arenarium	05/28/2002	67 FR 36968	NA	NA
Tetramolopium capillare	12/18/2000	65 FR 79192	NA	NA
	04/03/2002	67 FR 15856		
Tetramolopium remyi	12/27/2000	65 FR 79192	01/09/03	68 FR 1220
	04/04/2002	67 FR 15856		
	03/04/2002	67 FR 9806		
Vigna o-wahuensis	12/18/2000	65 FR 79192	02/27/03	68 FR 9116
	12/27/2000	65 FR 82086		
	12/29/2000	65 FR 83158		
	01/28/2002	67 FR 3940		
	03/04/2002	67 FR 9806		
	04/03/2002	67 FR 15856		
	04/05/2002	67 FR 16492		
	05/28/2002	67 FR 36968		
	05/28/2002	67 FR 37108		
Zanthoxylum hawaiiense	11/07/2000	65 FR 66808	02/27/03	68 FR 9116
	12/18/2000	65 FR 79192	03/18/03	68 FR 12982
	12/29/2000	65 FR 83158		
	01/28/2000	67 FR 3940		
	04/03/2002	67 FR 15856		
	04/05/2002	67 FR 16492		
	05/28/2002	67 FR 36968		

Summary of Comments and Recommendations

We received a total of seven oral and 2,779 written comments during the three comment periods on the revised proposal published on April 3, 2002, and the draft economic analysis, including the public hearing held on September 12, 2002, and the public meetings held on August 27, 2002 and September 26, 2002. These included responses from eight State offices, four local agencies, and 39 private organizations or individuals. Of the written comments, approximately 2,728 letters were submitted by facsimile or by e-mail, as part of mailing campaign, all in support of the proposed critical habitat designations. Of the other 51 comments, 21 supported the designation, 28 were opposed to it, and two provided information or declined to oppose or support the designations. We reviewed all comments received for substantive issues and new information regarding critical habitat for the Maui and Kahoolawe plants. Similar comments were grouped into ten general issues relating specifically to the proposed critical habitat designations and the draft economic analysis on the proposed designations. These are addressed in the following summary.

Peer Review

In accordance with our policy published on July 1, 1994 (59 FR 34270), we solicited independent opinions from 19 knowledgeable individuals with expertise in one or several fields, including familiarity with the species, familiarity with the geographic region that the species occurs in, and familiarity with the principles of conservation biology. We received comments from seven reviewers. One reviewer expressed support for the proposed critical habitat designations. The other six reviewers generally supported our methodology and conclusion, but none expressed support or opposition for the proposed critical habitat designations. Comments received from the peer reviewers are summarized in the following section and were considered in developing the final rule.

Issue 1: Species-Specific Biological Comments

(1) *Comment:* A peer reviewer noted that unit Maui I3 excludes two small DOFAW exclosures and an unprotected area containing good populations of *Geranium arboreum.* Critical habitat should be expanded to include these populations.

Our Response: While the habitat noted above may be important for the recovery of the species, not all suitable habitat (including occupied) is essential to the conservation of the species. At the time we proposed critical habitat on Maui, we were not aware of these exclosures, and we had identified and proposed other sites that (1) contain the primary constituent elements that are essential to the conservation of the species, (2) are within the species' historical range, and (3) accommodate

our recovery goals of 8 to 10 populations for *Geranium arboreum.*

(2) *Comment:* One commentor stated that the ''best scientific data available at this time'' does not support the areas being proposed for *Vigna o-wahuensis* on Kahoolawe. The proposed areas for this plant are based on a single observation at each of two different sites. Repeated surveys in these areas by plant specialists over the last 5 years have yet to confirm the presence of *Vigna* at these sites. However, the Navy commented that the area excluded from critical habitat perhaps merits reconsideration because *Vigna o-wahuensis* has appeared in the Lua Makika area on Kahoolawe that was previously the subject of a planned burn. That fact supports the conclusion that fire apparently does not adversely affect the constituent elements for *Vigna.*

Our Response: We have reevaluated the proposed designation of critical habitat for *Vigna o-wahuensis* on Kahoolawe in response to additional information received during the comment periods. Critical habitat was not designated for *Vigna o-wahuensis* on Kahoolawe because there is some question about the location of the earlier observations and because we were able to locate other sites that (1) contain the primary constituent elements that are essential to the conservation of the species, (2) are within the species' historical range, and (3) accommodate our recovery goals of 8 to 10 populations.

(3) *Comment:* One peer reviewer noted that reducing the amount of designated critical habitat for *Hibiscus brackenridgei* on West Maui and Lanai, because it occurs on more than one island, might adversely affect the retention of the genetic diversity needed for recovery. The diversity of East versus West Maui populations will not be retained if unit Maui D1 is reduced or removed. The Lanai prostrate form of the species is distinct from all other populations and should be conserved as a distinct recovery unit.

Our Response: We have retained our proposed designation of critical habitat for *Hibiscus brackenridgei* on Maui in this final rule. Because the Lanai populations are not considered by taxonomists to be a distinct subspecies, and therefore were not listed as such, we cannot consider them as separate from the Maui taxon. However, if the taxonomy is revised and the scientific community approves such revision, we will consider the new information with regard to critical habitat.

(4) *Comment:* One commenter was concerned that *Bidens micrantha, Lipochaeta kamolensis,* and *Sesbania tomentosa* might hybridize with other members of their families. It is possible that such unnatural hybridization could lead to further endangerment of the species while inducing the endangerment of other species.

Our Response: Hybridization presents potential problems with species recovery. To the maximum extent possible, we separated critical habitat of species that potentially had hybridization potential. In addition, issues of hybridization and other technical questions will be addressed in project specific recovery planning actions.

(5) *Comment:* In the case of *Phyllostegia mollis,* it appears that the Service is unsure for which species it is designating critical habitat. In the 1998 recovery plan for this species, the Service states, ''the Maui population may be separated into its own species.'' Critical habitat designation cannot be made for a plant or animal for which the science is so scant that more harm may come to the species by the designation.

Our Response: At the time the recovery plan was completed for *Phyllostegia mollis,* the Service acknowledged that the Maui population may warrant recognition as a separate species, based on a personal communication from Joel Lau, a botanist with the Hawaii Natural Heritage Program. In 1999, a taxonomic revision of the species was published by Dr. Warren L. Wagner in which the Oahu populations were recognized as *Phyllostegia mollis* and the Maui populations were assigned to *P. pilosa.* Due to the court-ordered deadlines, we are required to publish this final rule to designate critical habitat on Maui and Kahoolawe before we can prepare and publish a notice of taxonomic changes for this species. We plan to publish a taxonomic change notice for *Phyllostegia mollis* after we have published the final critical habitat designations on Maui and Kahoolawe. We do not believe that the designation of critical habitat for *Phyllostegia mollis* will entail harm to the species. Federal agencies are required to consult with the Service regarding any action they may fund, authorize, or permit that may affect a listed species or designated critical habitat. The consultation process results in conservation benefits to the species, not in harmful actions to the species.

(6) *Comment:* One commenter expressed concern about the designation of critical habitat for *Alectryon macrococcus* var. *auwahiensis* and *Melicope adscendens* on Ulupalakua Ranch. Forty *A. m.* var. *auwahiensis* trees were last sighted in 1910. No other populations of this tree were documented. However, the Service recommends that four new populations be established, even as far away as Kaupo. In the case of *M. adscendens,* the Service stated that within historic times, this species has apparently always been extremely rare. Restoring any plant or animal beyond their historical numbers and or geographical distribution is not the intent of the Act.

Our Response: Alectryon macrococcus var. *auwahiensis* trees were reported from the area as recently as 1990 and 1999. However, Ulupalakua Ranch has been excluded from critical habitat designation under section 4(b)(2), which states that critical habitat may be excluded if the benefits of not designating outweigh the benefits of designating critical habitat. We were also able to locate other sites for *A. m.* var. *auwahiensis* that (1) contain the primary constituent elements that are essential to the conservation of the species, (2) are within the species' historical range, and (3) accommodate our recovery goals of 8 to 10 populations.

(7) *Comment:* One peer reviewer and many commenters did not support the Service's conclusion that *Acaena exigua* would not benefit from critical habitat designation. These commenters pointed out that the fact that *Acaena* has not been sighted since 1999 (only three years ago) does not justify the Service's refusal to protect its critical habitat, as it is common for biologists in Hawaii to rediscover plants that have not been seen for decades. Some also felt that the decision was based on a faulty interpretation of the Act's direction to designate critical habitat ''to the maximum extent prudent.'' In enacting this language, according to these commenters, Congress clearly intended that the Service would designate critical habitat in all but the rare instances in which designation would actually increase threats to listed species from overcollecting or vandalism, or otherwise affirmatively harm the species. The Service cannot refuse to designate critical habitat merely because it cannot come up with examples of how critical habitat would benefit this species. Absent a finding that designation would actually harm *Acaena exigua* in some concrete way, the Service must designate its critical habitat. Furthermore, if the Service believes this species is extinct, it must follow the procedures set forth in the ESA for delisting species. As long as this species remains on the endangered species list, the Service cannot lawfully deny it the habitat protection that

Congress intended that all listed species enjoy.

Our Response: We continue to believe that it would not be prudent to designate critical habitat for *Acaena exigua.* It has not been seen in the wild since March 2000 (Hank Oppenheimer, Maui Pineapple Company Limited, pers. comm., 2001; Service 1997; 57 FR 20772) and is not known to be in storage or under propagation. Given these circumstances, we have determined that designation of critical habitat for *Acaena exigua* is not prudent because such designation would not be beneficial to the species. If this species is rediscovered, we may reconsider designating critical habitat for this species as new information becomes available. *See* 16 U.S.C. 1532(5)(B); 50 CFR 424.13(f).

Issue 2: Biological Justification and Methodology

(8) *Comment:* One peer reviewer was concerned about the number of populations needed for recovery. The expert opinion of the Hawaii Pacific Plant Recovery Coordinating Committee (HPPRCC) is that 10 to 20 viable populations are needed for recovery. How did the Service determine that 8 to 10 populations were all that should be required? While 8 to 10 populations may be sufficient for the recovery of long-lived species, it may be insufficient for ephemeral annuals or certain ferns or species with unique island variants. The target number of populations should be revisited on a species-by-species basis. Another peer reviewer commented that the proposed rule was improved by the use of targets of 8 to 10 populations ranging in size from 100 to 500 mature individuals, unless information that is more specific was available (*e.g.*, *Argyroxiphium sandwicense* ssp. *macrocephalum).* However, these targets are generally lower than those used by the HPPRCC and should be considered the ''low end'' of what is needed for recovery.

Our Response: In defining the procedures used to delineate essential habitat areas the HPPRCC agreed that ''the minimum target for each species was to have habitat for at least 10 potential populations for each species that was found on a single island and have habitat for at least 5 potential populations on each island for species that occurred on two or more islands. The maximum number of target populations was set at 20 potential populations.'' However, in defining generalized recovery objectives for Hawaiian plants, the committee recommended 5–10 populations for delisting. The Service adopted a relatively conservative 8–10 viable populations for the recovery objectives for each species in the recovery plans. Establishing and conserving 8 to10 viable populations on one or more islands within the historic range of the species will provide each species with a reasonable expectation of persistence and eventual recovery, even with the high potential that one or more of these populations will be eliminated by normal or random adverse events, such as the hurricanes that occurred in 1982 and 1992 on Kauai, fires, and nonnative plant invasions (HPPRCC 1994; Luijten *et. al.* 2000; Mangel and Tier 1994; Pimm *et. al.* 1998; Stacey and Taper 1992). We conclude that designation of adequate suitable habitat for 8 to 10 populations as critical habitat is essential to give the species a reasonable likelihood of long-term survival and recovery, based on currently available information.

(9) *Comment:* Areas that are excluded from proposed critical habitat should be identified and mapped in the proposed and final rule to allow reviewers to fully evaluate how well the proposal provides for listed species.

Our Response: Although we have not mapped the areas excluded from critical habitat, textual descriptions of the areas excluded can be found in the section titled ''Summary of Changes from the Revised Proposed Rule and *Analysis of Impacts Under Section 4(b)(2).*''

(10) *Comment:* One peer reviewer stated that the Service did not identify explicit modeling efforts that provide clear guidance for Hawaiian species. If available, these models should be evaluated and included in the Service's methodology to determine future critical habitat designations. Models of the population dynamics of understory plants in tropical forests, focusing on environmental variation caused by natural disturbance and plant-animal interactions, do exist.

Our Response: The lack of detailed scientific data on the life history of these plant species makes it impossible for us to develop a robust quantitative model (*e.g.*, population viability analysis) to identify the optimal number, size, and location of critical habitat units to achieve recovery. At this time, and consistent with the listing of these species and their recovery plans, the best available information leads us to conclude that the current size and distribution of the extant populations are not sufficient to expect a reasonable probability of long-term survival and recovery of these plant species. Therefore, our approach employed two widely recognized and scientifically accepted goals for promoting viable populations of listed species: (1) Creation or maintenance of multiple populations so that a single or series of catastrophic events cannot destroy the entire listed species, and (2) increasing the size of each population in the respective critical habitat units to a level where the threats of genetic, demographic, and normal environmental uncertainties are diminished. In addition, we used a GIS model that evaluated known current and historic range, elevation, rainfall, and vegetation units to determine potential habitat for each species. Using this information plus information from existing historically known plant locations and advice from species experts, we modeled the potentially suitable habitat for each species. The critical habitat designated is a subset of suitable potential habitat that was determined to be essential to the conservation of each species (see the ''Methods'' section for more detail).

(11) *Comment:* One peer reviewer commented that fencing and control of ungulates is critical to the success of a plant restoration program. One commenter was concerned that there is a lack of solid scientific evidence on the relationship between introduced ungulates (in particular, cattle), nonnative plants, and native ecosystems. In the recovery plan for *Lipochaeta kamolensis,* the Service appears to concur that more research on the relationship between managed ungulates and native plants needs to be examined. In the Recovery Plan for the Maui Plant Cluster, the Service states, ''Portions of the populations should be left unfenced until the effects of protection from grazing and browsing are fully known.'' Because the science on how to best protect these plants is not certain, the designation of critical habitat may have a negative, rather than positive impact.

Our Response: We believe that it is important to control threats to the survival and recovery of federally listed species and have received numerous sources of information demonstrating that nonnative ungulates are a threat to the listed plant species as can be seen in the discussion of each species' background in the ''Discussion of Plant Taxa'' and ''*Analysis of Impacts Under Section 4(b)(2): Other Impacts*'' sections of this final rule. However, critical habitat is only one of many tools established in the Act that can play an important role in the recovery of the species. Critical habitat designation does not create a wilderness area, preserve, or wildlife refuge. It does not require activities associated with conservation management such as

ungulate control and fencing. Critical habitat increases protection of federally listed species by requiring consultation under section 7 of the Act to ensure that any action authorized, funded, or carried out by a Federal agency is not likely to result in the destruction or adverse modification of the critical habitat. The management of nonnative species is an important conservation issue that is addressed in the recovery plans for these species.

(12) *Comment:* One peer reviewer stated that degraded areas should only be excluded if they lack the ability to become habitat in the future. Another peer reviewer felt that, in some situations, populations in degraded habitat might be critical to the viability of the overall populations. Other peer reviewers commented that degraded habitat should be considered secondary only if adequate non-degraded habitat is available and designated. Many peer reviewers were optimistic about the potential for degraded areas to be restored. One peer reviewer suggested that sites significantly altered by human activities, such as roads and buildings, should not be included in conservation plans, but that areas that have been altered by agriculture and other activities that do not significantly disturb the soil should be included as they provide potential sites for restoration of plant species. Other commenters objected to critical habitat designation in degraded areas.

Our Response: We agree that recovery of a species is more likely in designated critical habitat in the least degraded areas containing primary constituent elements. During our evaluation of areas essential for the conservation of the species we tried to select the least degraded areas where possible because these areas are most essential. However, for some species, especially those only known from low-elevation areas, only degraded habitat remains. Therefore, some units still contain degraded habitat, but only if the area could be restored. Management for the restoration of these habitats is addressed in the species' recovery plans.

(13) *Comment:* The proposed designation failed to contain all historically known listed plants, and therefore failed to propose critical habitat for all listed plants statewide. The following endangered plant species lack proposed critical habitat on Maui and Kahoolawe: *Abutilon menziesii; Argyroxiphium sandwicense* ssp. *sandwicense; Abutilon menziesii; Caesalpinia kaviensis; Gardenia brighamii; Haplostachys haplostachya; Panicum fauriei* var. *carteri; Santalum freycinetianum* var. *lanaiense;* and *Scaevola coriacea.*

Our Response: These species were not part of the lawsuit (see ''Previous Federal Action'' section) and subsequent stipulations, and therefore were not included in this rulemaking. Critical habitat for these species may be considered in the future if warranted and funding and resources are available.

(14) *Comment:* Peer reviewers and other commenters wrote that the amount, location, and type of land proposed for critical habitat appears to be mostly adequate for the long-term conservation of these species. In order to build self-sustaining populations, adequate land for expansion is required, and most peer reviewers supported inclusion of larger amounts of land. One peer reviewer believes that removing significant portions of any of the proposed critical habitat units is likely to prevent the recovery of, or lead to the extinction of, listed species. One peer reviewer felt that the boundaries appear to be set by landowner parcels and not based upon the habitat features required for protection, especially units Maui H and L. Other commenters questioned the methodology that led to the increase in proposed critical habitat from 33,614 acres (13,574) in the original proposal to 126,531 acres (51,208 ha) in the revised proposal. These commenters believe the proposed critical habitat units are larger than necessary. The Service should work to ensure that (1) areas designated as critical habitat are ''essential for the conservation of the species'', and that (2) ''critical habitat does not include the entire geographical area which can be occupied by the threatened or endangered species'' 16 U.S.C. 1532(5)(C).

Our Response: We made revisions to the unit boundaries based on information supplied by commenters, as well as information gained from field visits to some of the sites, that indicated that the primary constituent elements were not present in certain portions of proposed units, that certain changes in land use had occurred on lands within the proposed critical habitat that would preclude those areas from supporting the primary constituent elements, or that the areas were not essential to the conservation of the species in question. In many cases, critical habitat boundaries were reduced for multi-island species because we have identified adequate and more appropriate habitat on other islands within the historical range in at least eight other places that have more primary constituent elements or are less degraded; already undergoing restoration; within a partnership, NAR, or TNCH preserve; or on a refuge.

No critical habitat units in the proposed rule were excluded or modified due to economic impacts. However, section 4(b)(2) of the Act requires us to consider other relevant impacts, in addition to economic impacts, of designating critical habitat. An area may be excluded from designation as critical habitat if the Secretary determines the benefits of excluding the area outweigh the benefits of designating the area as critical habitat (and provided the exclusion would not result in the extinction of the species). We have removed the two TNCH Maui Preserves, the State's Hanawi NAR, Maui Land and Pineapple Company, Inc.'s (ML&P) Puu Kukui Watershed Management Area (WMA), and Ulupalakua and Haleakala Ranches from final critical habitat designation based upon either their conservation history or the relevant issue that designation of critical habitat would have a negative effect on the landowner's voluntary ongoing conservation activities as well as future activities under consideration by the landowner. In both cases, we believe it is in the best interest of the species to exclude habitat from the designation based on their conservation actions. See ''*Analysis of Impacts Under Section 4(b)(2): Other Impacts*''.

The land area in the second proposal of critical habitat was increased from the first proposal caused by the Service's decision to include unoccupied habitat. To recover the species, it is essential in some instances to conserve suitable habitat that is not currently occupied to allow for the establishment of additional populations through natural recruitment or managed reintroductions. Establishment of additional populations will increase the likelihood that the species will survive and recover in the face of normal and stochastic events (*e.g.*, hurricanes, fire, and nonnative species introductions).

(15) *Comment:* The majority of our peer reviewers agreed that the methodology used to define critical habitat is appropriate, scientifically well grounded, and conceptually sound. The proposed rule represents the best scientific information available and the most scientifically appropriate techniques for determining critical habitat on Maui. On the other hand, some commenters felt that the Service's approach to designating critical habitat was not based on scientific principles and knowledge of the needs of the plant species. The proposed rule acknowledges that little is known about the life history, threats, or preferred

habitat of particular species and applies a ''broad-brush'' approach.

Our Response: In accordance with our policy on peer review published on July 1, 1994 (59 FR 34270), we solicited the expert opinions of appropriate and independent specialists regarding the proposed rule. The purpose of this peer review was to ensure that our methodology for designation of critical habitat of Maui plants was based on scientifically sound data, assumptions, and analysis. The majority of peer reviewers support our methodology. All data and information on species status information received in preparation of this rule were weighted equally and considered to come from reliable sources. Where discrepancies existed between different data sources, the most current data were used. While we agree that additional time would be beneficial for the preparation of these final rules, and the collection of more scientific information, we are required under the court-approved stipulation to finalize this designation by April 18, 2003. If provided with new information, we may revise the critical habitat designation in the future.

(16) *Comment:* Peer reviewers commented that a multi-population approach is essential for the survival and recovery of listed Hawaiian plant species. Multiple populations prevent small-scale changes in habitat from destroying all remaining individuals. The multiple population approach offers the opportunity to protect a wider range of genetic variability for each species, rather than concentrating on a single or small number of areas with genetically similar individuals. The Service has designated enough land to provide for the long-term conservation of multiple populations of the listed species.

Our Response: We agree that the multi-population approach to conservation is necessary for the recovery of Hawaii's endangered plants.

(17) *Comment:* One peer reviewer and other commenters stated that the proposed rule is improved by the inclusion of appropriate unoccupied habitat because such habitat will help to recover species that have been reduced to an unsustainable number of populations.

Our Response: We agree. Our recovery plans for these species identify the need to expand existing populations and reestablish wild populations within historic range.

(18) *Comment:* Several commenters opposed designating critical habitat in unoccupied areas. Two commenters wrote that lands in urban, agricultural, and rural districts are designated, used, and intended for a wide variety of land use activities. As such, there is a much greater likelihood that critical habitat designation will have an adverse economic impact on the landowner. These commenters recommend the following rebuttable presumption: non-conservation lands which are unoccupied by any listed species should not be designated as critical habitat

Our Response: Our recovery plans for these species identify the need to expand existing populations and reestablish wild populations within the historical range. Because of the very limited current range of many of these species, designating only occupied areas would not meet the conservation requirements of the species and would be inconsistent with our recovery plans. Occupied areas, as well as the similar habitat around them within the designated units of critical habitat that may be occupied in the future, provide the essential life-cycle needs of the species and provide some or all of the habitat components essential for the conservation (primary constituent elements) of these species. Expansion of some of these species to areas that were likely to have been historically occupied is essential to their recovery.

When designating unoccupied habitat for these species, we first evaluated lands that are suitable for each species. Of this suitable habitat, we determined which areas are essential for the conservation of each species using the guidelines outlined in the recovery plans (*i.e.*, areas that contain one or more of the primary constituent elements and are either in good condition for recovery efforts or could be made suitable through appropriate management actions), and would provide space needed by the species to reach our recovery goals of 8 to 10 populations with a minimum of 100 mature reproducing individuals per population for long-lived perennials, 300 mature reproducing individuals per population for short-lived perennials, and 500 mature reproducing individuals per population for annuals.

Areas that contain one or more of the primary constituent elements, are either in good condition for recovery efforts or could be made suitable through appropriate management actions, and would provide space needed by the species to reach our recovery goals of 8 to 10 populations with a minimum number of mature reproducing individuals as specified above, were determined to be essential for the conservation of each species, regardless of land-use zoning.

(19) *Comment:* Proposed critical habitat includes unoccupied habitat. It appears that the Service has designated unoccupied habitat largely based on guesswork and the faulty conclusion that any areas that appear, based on limited biological knowledge to be potentially suitable habitat for these species (*i.e.*, ''merely capable of supporting'' these species), are by default essential habitat. This conclusion is not consistent with the provisions in the Act.

Our Response: As explained in the Methods section of this rule, we used the best scientific information available to determine areas that contain the physical and biological features that are essential for the conservation of the species covered by this designation. This information included the known locations, site-specific species information from the HINHP database and our own rare plant database; species information from the Center for Plant Conservation's (CPC's) rare plant monitoring database housed at the University of Hawaii's Lyon Arboretum; island-wide Geographic Information System (GIS) coverages (*e.g.*, vegetation, soils, annual rainfall, elevation contours, land ownership); the final listing rules for these 60 species; the December 18, 2000, proposal; the April 3, 2002, revised proposal; information received during the public comment periods and the public hearings; recent biological surveys and reports; our recovery plans for these species; and any species and management information received for the islands of Maui and Kahoolawe; discussions with botanical experts; and recommendations from the Hawaii and Pacific Plant Recovery Coordinating Committee (HPPRCC) (see also the discussion below) (GDSI 2000; HINHP Database 2000; HPPRCC 1998; Service 1995a, 1995b, 1996a, 1996b, 1997, 1998a, 1998b, 1999, 2001; 65 FR 66808; 67 FR 3940; CPC *in litt.* 1999).

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

The HPPRCC identified essential habitat areas for all listed, proposed,

and candidate plants and evaluated species of concern to determine if these essential habitat areas would provide for their habitat needs. However, the HPPRCC's mapping of habitat was distinct from the regulatory designation of critical habitat as defined by the Act. In addition, data have been collected since the recommendations made by the HPPRCC in 1998. Much of the area that was identified by the HPPRCC as inadequately surveyed has now been surveyed to some degree. New location data for many species have been gathered. Also, the HPPRCC identified areas as essential based on species clusters (areas that included listed species as well as candidate species, and species of concern) while we have only delineated areas that are essential for the conservation of the specific listed species at issue. As a result, the critical habitat designations in this rule include not only some habitat that was identified as essential in the 1998 recommendations but also habitat that was not identified as essential in those recommendations.

Issue 3: Site-Specific Biological Comments

(20) *Comment:* One peer reviewer was concerned about the lower elevation wet forests on windward Haleakala because Hanawi NAR is expected to be fenced only above 1,000 meters in elevation. *Cyanea mceldowneyi, Cyanea copelandii,* and *Clermontia samuelii* may rely on habitat lower than 1,000 meters in elevation.

Our Response: While the habitat lower than 1,000 m (3,281 ft) in elevation may be important for the conservation of these species, we do not believe that this habitat contains the primary constituent elements for *Cyanea mceldowneyi, Cyanea copelandii,* and *Clermontia samuelii.* Therefore, we did not find this area to be essential to the conservation of these three species.

(21) *Comment:* The boundaries of units Maui A and B should be relocated to follow existing conservation boundaries. The boundaries of units C1 and C2 should be refined to reflect that the appropriate habitat of the species of concern is sea cliffs within the spray zone. It should be clarified that units Maui C1 and C2 are unoccupied critical habitat for *Centaurium sebaeoides* and *Sesbania tomentosa.*

Our Response: The boundaries of units Maui A and B have been revised. We are no longer proposing critical habitat units Maui C1 and C2 for *Centaurium sebaeoides* and *Sesbania tomentosa* because we were able to locate other sites that were less degraded, contain a better representation of the primary constituent elements that are essential to the conservation of the species, are within the species' historical ranges, and accommodate our recovery goals of 8 to 10 populations.

(22) *Comment:* KIRC commented that, while we support the mission of the Service and the extraordinary efforts it is taking to protect endangered plants, the KIRC feels it is unnecessary to establish critical habitat for the listed taxa on Kahoolawe because of ongoing management for endangered species on the island by KIRC. In addition, because Kahoolawe is already a permanent natural and cultural reserve and a National Historic Site, it is already bound by a set of Federal and State rules for careful stewardship and does not require an additional layer of protection. Further, two of the proposed plants, *Hibiscus brackenridgei* and *Neraudia sericea,* have not been seen in over 90 years, although biological consultants continue to survey their historical locations.

Our Response: We did not designate critical habitat for *Hibiscus brackenridgei* and *Neraudia sericea* on Kahoolawe because we were able to locate other sites that contain the primary constituent elements that are essential to the conservation of the species, are within their historical ranges, and accommodate our recovery goals of 8 to 10 populations. The footprint of critical habitat on Kahoolawe is greatly reduced, although it remains designated for *Kanaloa kahoolawensis,* as Kahoolawe has the only suitable habitat for this species identified by our species experts. Designations of critical habitat are to be made on the basis of the best scientific and commercial data available, after taking into account the economic and other relevant impacts of specifying any area as critical habitat (16 U.S.C. 1533(b)(2)). An area may be excluded from designation as critical habitat if the Secretary determines the benefits of excluding the area outweigh the benefits of designating the area as critical habitat (and provided the exclusion would not result in the extinction of the species). However, because this is the last known occupied habitat for *Kanaloa kahoolawensis,* we do not believe that the benefits of excluding Kahoolawe outweigh the benefits of including it. *See ''Analysis of Impacts Under Section 4(b)(2): Other Impacts''.*

(23) *Comment:* One peer reviewer commented that the rationale for the configuration of unit Maui H is not clearly explained. In general, units should maximize interior areas and have easily identifiable boundaries. Why was an area almost encircled by unit Maui H excluded? This area appears to be part of the Kahikinui Forest Reserve with current populations of *Bidens micrantha* ssp. *kalealaha, Clermontia lindseyana, Diellia erecta, Diplazium molokaiense* and *Phyllostegia mollis.* If the Kahikinui area is not managed appropriately, adequate habitat for the above-mentioned species might not exist. Another peer reviewer questions the exclusion of the Waiopae-Wailaulau-Pahihi area from unit Maui H because it contains occurrences for two to three plant species and is DOFAW land slated and funded for fencing, restoration, and removal of cattle. It is crucial to include this parcel.

Our Response: We evaluated the Kahikinui area and determined that it was not essential for the conservation of the species because critical habitat was designated elsewhere for these species that is less degraded and contains a better representation of the primary constituent elements that are essential to the conservation of the species, are within their historical ranges, and accommodates our recovery goals of 8 to 10 populations.

Issue 4: Effects of Critical Habitat Designation

(24) *Comment:* One commenter suggested that critical habitat designation presents an opportunity to expand Hawaii's appeal in ecotourism. Many of the areas covered by the designation are degraded forests that could be restored to showcase Hawaii's unique birds and plants.

Our Response: Although we agree that the restoration of degraded forests is essential to the conservation of federally listed species, critical habitat is only one of many tools established in the Act that can play an important role in the recovery of the species. Critical habitat designation does not create a wilderness area, preserve, or wildlife refuge. It does not require activities associated with conservation management, such as ungulate control and fencing. Critical habitat increases protection of federally listed species by requiring consultation under section 7 of the Act to ensure that any action authorized, funded, or carried out by a Federal agency is not likely to result in the destruction or adverse modification of the critical habitat.

(25) *Comment:* Animal Rights Hawaii stated that although they support protection for endangered species, they are also concerned about protecting nonnative species. The current interpretation of critical habitat allows the Federal government and its partners

to utilize any methodology they wish in dealing with feral animals, even though such methods may be cruel and environmentally unsound.

Our Response: The designation of critical habitat does not give the Federal government and its partners the authority to utilize any methodology they wish in dealing with feral animals. Any potential animal control program would be subject to all applicable State, Federal, and local laws.

(26) *Comment:* Critical habitat designation, and the underlying decision to list as endangered the species that are the subject of the designation, exceed the constitutional limits of the Service's delegated authority. Congress enacted the ESA as an exercise of its Commerce Clause power and delegated exercise of that Commerce Clause power to the Service to apply the ESA by regulation. The listed species are not interstate. They exist only in Hawaii and do not cross state lines. Nor are they in commerce as the subject of any economic endeavor. They lack any commercial value. Therefore, the Service's regulations listing these species and designating critical habitat for them within Hawaii exceed the Federal power to regulate interstate commerce under the governing precedents interpreting the Commerce Clause.

Our Response: The Federal government has the authority under the Commerce Clause of the U.S. Constitution to protect species, for the reasons given in Judge Wald's opinion and Judge Henderson's concurring opinion in *National Association of Homebuilders* v. *Babbitt,* 130 F. 3d 1041 (D.C. Cir. 1997), *cert. denied,* 1185 S.Ct, 2340 (1998). *See also Gibbs* v. *Babbitt,* No. 99–1218 (4th Cir. 2000). The *Home Builders* case involved a challenge to application of ESA prohibitions to protect the listed Delhi Sands flower-loving fly (*Rhaphiomidas terminatus abdominalis*). As with the species at issue here, the Delhi Sands flower-loving fly is endemic to only one state. Judge Wald held that application of the ESA to this fly was a proper exercise of Commerce Clause power because it prevented loss of biodiversity and destructive interstate competition.

(27) *Comment:* Many commenters questioned the utility of critical habitat designation because it will not result in on-the-ground improvement of habitat or endangered species. Most commenters felt that voluntary partnerships to effect actual land management would be more beneficial to the species. Conversely, some commenters pointed out that critical habitat will prevent the Federal government from carrying out activities that destroy habitat or species in need of recovery and that it will benefit the people of Maui by preserving native forests, thus preventing erosion that pollutes water and smothers reefs.

Our Response: Critical habitat designation is one of a number of conservation tools established in the Act that can play an important role in the recovery of a species. For a Federal action to adversely modify critical habitat, the action would have to adversely affect the critical habitat's constituent elements or their management in a manner likely to appreciably diminish or preclude the role of that habitat in the conservation of the species. Designation of critical habitat is a way to guide Federal agencies in evaluating their actions, in consultation with the Service, such that their actions do not hamper conservation of listed species. There also are educational or informational benefits to the designation of critical habitat. Education benefits include the notification of land owners, land managers, and the general public of the importance of protecting the habitat of these species and dissemination of information regarding their essential habitat requirements.

(28) *Comment:* One commenter stated that the designation of critical habitat may result in delays and confusion in water use decisions in the State and that permits for non-point source discharges into protected areas may be denied, which would have a devastating effect on agricultural activities.

Our Response: As noted in the October 2002 Draft Economic Analysis (DEA), the likelihood of changes to the existing water diversions based on critical habitat is very low for the following two reasons: (1) None of the plants are stream-dependent for their survival and therefore would not cause a reduction in water diversion, and (2) water infrastructure is considered a manmade feature and therefore would not be included in critical habitat pursuant to the rule, because these features and structures normally do not contain, and are not likely to develop, any primary constituent elements. Thus, unless its operation and maintenance would indirectly affect critical habitat, which is not anticipated, it should not be affected by section 7 of the Act.

The potential impacts on State water uses were analyzed in the October 2002 DEA and December 2002 Addendum to the DEA. As noted in the DEA and Addendum, Maui County and Department of Water Supply (DWS) submitted specific information regarding planned projects in the proposed critical habitat during the public comment period. Possible and planned projects by the DWS include water source development in Unit B2; construction of a water reservoir adjacent to Unit L; access and intake improvements in Unit L; and repair and maintenance of existing flumes in Unit L. As noted in this final rule, we have removed Unit B2 from the final designation. Most of the identified DWS projects in Unit L involve repair and maintenance of existing manmade features and structures, and as such, would not be subject to section 7 consultation. However, to the extent that the planned improvements go beyond repair and maintenance and would be subject to section 7 consultation caused by Federal funding or permitting, the DEA's estimate of zero to two consultations reasonably reflects the potential number of section 7 consultations over the next 10 years (see Chapter VI, Section 3.k. of the DEA). As a worst case scenario, the DEA estimates that the consultations could cost up to $68,000 with project modifications that could range up to $200,000.

The State Department of Health Polluted Runoff Control Program and the State Office of Planning, Coastal Zone Management Program work together to address nonpoint source pollution through outreach and education and programs that utilize incentives. Under the Coastal Zone Act Reauthorization Amendments, Section 6217, the State is required to meet various conditions for approval of the State's Coastal Nonpoint Pollution Control Program by the U.S. Environmental Protection Agency. To meet these conditions, the State Department of Health is developing administrative rules to create Statewide enforceable policies and mechanisms to address nonpoint source pollution. These draft rules are currently the subject of public informational meetings. Public comments and suggestions received during these meetings will be considered before final rules are drafted and proposed to the Governor.

At the present time, there is no permit requirement for nonpoint source pollution. Moreover, the proposed rules regarding nonpoint source pollution make no reference to either water quality standards or to critical habitat. Until the State administrative rules are finalized, the impact caused by the interplay of nonpoint source pollution requirements and the designation of critical habitat is entirely speculative.

Issue 5: Mapping and PCEs

(29) *Comment:* The State of Hawaii Department of Transportation (DOT) stated that the proposed designations near State routes would restrict the design, maintenance, and construction of highways. In particular, Units Maui C1 and C2 may impact Route 30, Honoapiilani Highway, and Unit C3 may impact route 30, Kahekili Highway. Highway corridors require constant upkeep and periodic improvements to maintain safe transportation, keep abreast of changing policies and regulations, limit liability exposure, and manage congestion. These activities, and the intrusive nature of highway traffic itself (pollutants, litter, alien species), tend to conflict with the critical habitat designation. The DOT recommends that buffer zones on each side of the State highway right of way should be excluded from proposed critical habitat to minimize designation-related costs for future improvements, maintenance, and repair to roads, bridges, drainage culverts etc. The buffer zones should be based on topography and be a minimum of 100 feet (30 m) in width.

Our Response: Units C1 and C2 have been removed from the final designation and Unit C3 has been substantially reduced in the final designation. State DOT's comments did not identify any planned widening or other significant improvement project within Unit C3. Rather, State DOT's concerns focused on the impact to routine repair and maintenance. Operation and maintenance of existing manmade features and structures adjacent to critical habitat are not subject to section 7 consultation, unless they involve federal funding or permitting and they affect the critical habitat or the species.

(30) *Comment:* The Service should reconsider designating critical habitat on Navy lands because such designation will adversely impact the Navy's ability to accomplish its national defense mission. The designation will also impose costly procedural burdens on the Navy's ongoing efforts to clear ordnance at Kahoolawe. A careful analysis of the benefits and burdens of critical habitat designation may result in a determination that critical habitat designation on Kahoolawe is not prudent, especially in light of potential prescribed burns for clearing ordnance. While the Navy will manage endangered species found on its property, it will not agree to introduce any endangered species to an area where it is currently absent.

Our Response: In 1993, the U.S. Congress passed a law that required the return of Kahoolawe to the State of Hawaii and authorized Federal funding through November 2003. Therefore, critical habitat will not adversely impact the Navy's ability to accomplish its national defense mission as the Navy will not have a presence on the island for that purpose. As modified, the critical habitat designation on Kahoolawe covers the southeastern coastline, an area along the eastern side of the island, and an area on the western side of the island, predominantly overlapping with Level 3 and Level 4 areas—areas which have either received surface clearance only or which have received no ordnance clearance. Anticipated activities in these areas within the next 10 years are likely to be limited to ordnance removal. Part of the designation on the western tip of Kahoolawe is a Level 1 area, and anticipated activities in this area could include operation of overnight campsites with minimal facilities to support restoration efforts. The December 2002 Addendum to the Draft Economic Analysis of Proposed Critical Habitat for the Maui and Kahoolawe plants considered the effects of critical habitat designation on the Navy's clean-up program on Kahoolawe and estimates section 7 consultation costs to range from $0 to $47,100. The removal of ordnance, which will enable long-term restoration efforts to proceed, is consistent with the recovery goals for these listed plant species on Kahoolawe. Kahoolawe is essential to the conservation of *Kanaloa kahoolawensis* because this is the only place where this plant currently is known to exist.

Issue 6: Definition of Critical Habitat

(31) *Comment:* Many commenters, including peer reviewers, noted that critical habitat should be identified for all areas that may need to be managed for the benefit of the listed species. The ESA defines critical habitat (Section 3 (5)(A)(I)) as ''the specific areas * * * (I) essential to the conservation of the species and (II) which may require special management considerations or protection. It does not use the phrase ''which may require *additional* special management considerations or protection.'' Therefore, all areas that meet the definition of critical habitat should be designated, even if they are currently being managed for conservation. Designation of these areas would be in accordance with the mandatory duty to designate critical habitat ''to the maximum extent prudent and determinable'' 16 U.S.C. 1533(a)(3). Also, designation will provide an additional measure of protection by preventing Federal agencies from carrying out funding or approving any activity likely to result in adverse modification or destruction of critical habitat, whether directly or indirectly, regardless of the location of the activity. Furthermore, areas that may have adequate management in place may not be safe from even direct threats from Federal activities, which can arise with little warning. Additionally, adequate funding for conservation and management of listed species on lands currently being managed for conservation may not be assured. Multiple commenters wrote that the following areas should be designated as critical habitat: Haleakala National Park; Puu Kukui Watershed Management Area; Waikamoi; Kapunakea Preserves; and Hanawi Natural Area Reserve.

Our Response: While we do not necessarily agree with the commenters' interpretation of section 3(5)(A) we considered whether the areas proposed for exclusion because special management was not needed should be designated as critical habitat. However, section 4(b)(2) of the Act requires us to consider other relevant impacts, in addition to economic impacts, of designating critical habitat. An area may be excluded from designation as critical habitat if the Secretary determines the benefits of excluding the area outweigh the benefits of designating the area as critical habitat (and provided the exclusion would not result in the extinction of the species). We have removed the two TNCH Maui Preserves, the State's Hanawi NAR, ML&P's Puu Kukui WMA, and Ulupalakua and Haleakala Ranches from final critical habitat designation based upon either their conservation history or the relevant issue that designation of critical habitat would have a negative effect on the landowner's voluntary ongoing conservation activities as well as future activities under consideration by the landowner. In both cases, we believe it is in the best interest of the species to exclude habitat from the designation based on their conservation actions. *See* ''*Analysis of Impacts Under Section 4(b)(2): Other Impacts*''.

(32) *Comment:* Alexander and Baldwin, Inc., requested that the Service consider excluding lands managed by the East Maui Watershed Partnership (EMWP) because future EMWP efforts to protect the watershed are likely to include many of the same management measures identified as necessary for the recovery of endangered plant species within the watershed (*e.g.,* control of ungulates and invasive weeds). Cooperative conservation efforts by landowners ultimately will benefit

endangered species more than the mere designation of critical habitat.

Our Response: We agree that cooperative conservation efforts by landowners are important to the conservation of Hawaiian plant species. We did exclude portions of the EMWP, including portions of Hanawi NAR, Haleakala Ranch, and Waikamoi Preserve. However, at this time, we did not find the benefits of excluding other lands within the EMWP to outweigh the benefits of including them in critical habitat, under section 4(b)(2) of the Act. As resources allow, the Service would be willing to consider future revisions or amendments to this final critical habitat rule if landowners affected by this rule develop conservation programs or partnerships (*e.g.,* Habitat Conservation Plans, Safe Harbor Agreements, conservation agreements, etc.) on their lands that outweigh the regulatory and educational benefits of a critical habitat designation (*see* ''*Analysis of Impacts Under Section 4(b)(2): Other Impacts*'' for which the benefits of exclusion exceed the benefits of inclusion).

(33) *Comment:* One peer reviewer stated that it is not strategically wise to exclude most of the East Maui Watershed above 3,500–4,000 ft (1,067–1,219 m).

Our Response: We agree that the area is essential for the conservation of many of these species and have designated portions of this area as critical habitat.

(34) *Comment:* Maui Land and Pineapple Company, Inc. requested that the currently actively managed, conservation-zoned lands on West Maui (A, B1, and B2) be excluded from critical habitat designation. ML&P has cooperated with many other conservation agencies, including the Service, to preserve the native biodiversity of its conservation lands.

Our Response: We have excluded some of ML&P's lands under section 4(b)(2) of the Act, finding that the benefits of their conservation efforts outweigh the benefits of including those lands in this designation (*see* ''*Analysis of Impacts Under Section 4(b)(2): Other Impacts*''). However, there are other ML&P lands for which we did not make this finding, and they are therefore included in this critical habitat designation.

(35) *Comment:* The Service should comment on how Haleakala National Park will function as a result of designation of unit Maui J.

Our Response: Haleakala National Park will continue to function much the same as it had before the critical habitat designation. However, they will need to consult with us, under section 7 of the Act, if they are planning a project that may affect critical habitat.

(36) *Comment:* The Estate of James Campbell requested that the critical habitat boundaries for their Kula and Kaupo properties be amended in light of a lack of important data on species' life history and habitat. They specifically request that the proposed designation on the Kaupo property be adjusted to exclude unoccupied agricultural land that could be adversely affected by such a designation.

Our Response: Unoccupied agricultural lands of the Kaupo properties were not included in the proposed or final designations. However, we have found that some of the James Campbell Estate lands are essential to the conservation of some of the species and do not meet the criteria under section 3(5)(A) of the Act for exclusion because long-range management goals and plans are not yet in place. These lands have been included in the final critical habitat designation. As resources allow, however, the Service would be willing to consider future revisions or amendments to this final critical habitat rule if landowners affected by this rule develop conservation programs or partnerships (*e.g.,* Habitat Conservation Plans, Safe Harbor Agreements, conservation agreements, etc.) on their lands that outweigh the regulatory and educational benefits of a critical habitat designation (*see* ''*Analysis of Impacts Under Section 4(b)(2): Other Impacts*'').

(37) *Comment:* Ulupalakua Ranch requested that its lands be removed from proposed critical habitat for the following reasons: (1) Likelihood of private party lawsuits resulting in mandated protection for critical habitat; (2) likelihood of private party lawsuits limiting current ranch operations; (3) limits on development of diversified agricultural operations caused by the Ranch's interest in Federal cost share programs; (4) lost revenues; (5) expenditures to assess the impact of the proposed designations; (6) economic hardship resulting from increased expenses to counter trespassing caused by increased curiosity over critical habitat lands; (7) lower economic returns and job loss caused by critical habitat dividing up sections of the Ranch, thus leading to inefficiency; (8) concern over the Service becoming involved in County Permitting processes (as they did when Ulupalakua Ranch requested a Special Use Permit from the County of Maui for telecommunications purposes); (9) ranch lands consisting of predominantly nonnative alien species that the Service has documented as threats; and (10) a reduced willingness of the Ranch to participate in voluntary conservation efforts.

Our Response: We found that Ulupalakua Ranch met the requirements under 4(b)(2) of the Act (*see* ''*Analysis of Impacts Under Section 4(b)(2)*'') and therefore has been excluded from critical habitat designation.

Issue 7: Policy and Regulations

(38) *Comment:* One commenter opposed the designation of critical habitat in East Maui from Makawao to Kula because hunters use these areas.

Our Response: Critical habitat designation does not affect activities, including human access, on State or private lands unless some kind of Federal permit, license, or funding is involved and the activities may affect the species. It imposes no regulatory prohibitions on State or other non-Federal lands, nor does it impose any restrictions on State or non-Federal activities that are not funded or authorized by any Federal agencies. Access to Federal lands that are designated as critical habitat is not restricted unless access is determined to result in the destruction or adverse modification of the critical habitat. If we determine that access will result in adverse modification of the critical habitat, we will suggest reasonable or prudent alternatives that allow the proposed activities to proceed. Recreational, commercial, and subsistence activities, including hunting, on non-Federal lands are not regulated by this critical habitat designation, and may be impacted only where there is Federal involvement in the action and the action is likely to destroy or adversely modify critical habitat. According to our economic analysis the probability of a major change in game management by the State is regarded as slight. Thus, designation of critical habitat is expected to have minor economic impacts related to management of game mammals and to hunting.

Issue 8: Economic Issues

(39) *Comment:* An economic analysis (EA) must be completed before critical habitat is designated. Even though the Service is designating critical habitat before conducting an EA in order to meet a court imposed deadline, the Service is not relieved from meeting the prudent and determinable standard for designating critical habitat. It is a disservice to the landowners to not include an economic impact analysis at the time of proposed designation even if the Service anticipates that such designation will not have any significant economic impact. Any

proposed critical habitat designated without first conducting an economic analysis would be imprudent and premature.

Our Response: We did not designate critical habitat before conducting an EA. The draft economic analysis was published and made available for review on October 2, 2002 (67 FR 61845). The comment period on the proposed rule to designate critical habitat for these 61 species from the islands of Maui and Kahoolawe was extended until November 1, 2002, to allow interested and affected parties the opportunity to review the draft economic analysis in conjunction with the proposed critical habitat rule.

The Service determines whether critical habitat designation is prudent according to regulations found at 50 CFR 424.12(a). In accordance with these regulations, critical habitat designation is not prudent only when one or both of the following two 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 such threat to the species; or (2) such designation would not be beneficial to the species. The economic analysis is conducted after critical habitat has been proposed in a given area, as set forth in regulations found at 50 CFR 424.19. If we find that economic and other impacts outweigh the benefit of designating critical habitat in a given area, that area may be excluded.

(40) *Comment:* The proposal identifies portions of two habitat units (units C1, C2, C3, G1, and G5), that consist in part of private lands and are occupied by only one or two species, which have known current populations on other islands. Portions of these units may have economic value to their respective landowners for eventual shoreline development or as sources of surface water for irrigation. Absent the economic analysis, it is impossible to determine from the proposal whether the benefits of excluding these areas would outweigh the benefits of including them as critical habitat.

Our Response: We agree that it is difficult to determine the relative costs and benefits of critical habitat designation without benefit of an economic analysis. It is precisely for this reason that the draft economic analysis was made available for review immediately upon completion on October 2, 2002, and the public comment period on the proposed critical habitat designations for these 61 species from the islands of Maui and Kahoolawe was extended until November 1, 2002. Maui units C1 and C2 have not been designated as final critical habitat. Maui unit C3 has been reduced to include only State owned lands within the conservation district and G1 and G5 have been reduced to lands within the conservation district. No costs are expected to occur from such impacts to water systems, because none of the plants are stream-dependent for their survival and therefore would not cause a reduction in water diversions. In addition, water infrastructures are considered a manmade feature and therefore its operation and maintenance are not subject to critical habitat provisions of section 7, because these features and structures normally do not contain, and are not likely to develop, any primary constituent elements.

(41) *Comment:* The DEA did not address, or did not adequately consider, a variety of costs and benefits that they believe could occur caused by the implementation of section 7 consultation for these species.

Our Response: Many of these possible costs were considered and some were addressed in the DEA. In many cases, however, potential costs were purposely not addressed in the DEA because they are not expected to occur. In other cases, it is possible for them to occur. In still other cases, the concerns no longer have substance given the Service's modifications to the proposed critical habitat. Finally, in some cases, the comments provided new information and costs were modified in section 4 of the Addendum.

(42) *Comment:* One commenter stated that the proposed designation fails to properly consider the importance of cooperation and goodwill between the Service and private landowners, and the impact critical habitat designations will have in discouraging voluntary partnerships on private lands. Haleakala Ranch stated that if critical habitat were designated on ranch lands, the ranch would cease participation in conservation projects designed to promote endangered species recovery. The ranch also stated that access to Haleakala Ranch land will be denied to those seeking data about the presence of the listed species, and future partnerships, existing agreements, and a land steward position may be terminated in an effort to insulate the company from outside governmental oversight. The ranch prefers to work cooperatively with the Service and other conservation entities to continue its legacy of land stewardship. Ulupalakua Ranch stated that designation of critical habitat would result in discontinuation of its associations with organizations associated with native plant restoration. Ulupalakua Ranch will also deny access to those interested in plant conservation and would not allow reintroductions of any native plants to its private property. Similarly, Alexander and Baldwin, Inc. cautioned the Service to carefully consider the benefits of existing cooperative agreements such as the East Maui Watershed Partnership and the potentially chilling effect that designation might have on such agreements. The Estate of James Campbell also stated a preference for encouraging the establishment of voluntary partnerships with landowners to effectuate the desired species conservation. This commenter further stated that the regulatory approach discourages the cooperation which has been a key to successful species conservation. Another commenter stated that if the Service truly wants to carry out its mission statement and ''work with others to conserve, protect and enhance fish, wildlife and plants, and their habitats for the continuing benefit of the American people,'' they should meet with the community of the DHHL Kahikinui homesteads to explain in clear and concise terms what is being proposed and exactly how it may impact our community. Others expressed similar concerns that cooperation and on-the-ground management were more important than critical habitat designation.

Our Response: Chapter VI, Section 4.j. of the DEA discusses the potential for reduced cooperation with the Service on conservation projects as a result of critical habitat. The DEA determines that a modest but undetermined reduction in cooperation may occur, along with a corresponding but undetermined environmental loss to society. However, as the comment indicates, the Service received letters from two landowners, Ulupalakua Ranch and Haleakala Ranch, during the public comment period stating that they will no longer participate in conservation projects designed to assist native plant species if critical habitat is designated on their land. Over the past three years alone, these landowners have participated in more than seven different conservation projects, receiving more than $290,000 from the Service or Natural Resources Conservation Service (NRCS). This funding is often matched by the landowner, and thus the cost of these projects likely exceeds $580,000. While the benefits of these projects are difficult to quantify (as discussed further in section 6 of the Addendum), the biological value of these projects to the native plants is at minimum equal

to the costs of each project. Assuming that participation over the past three years is indicative of the average level of participation, over a period of ten years, the value of the conservation projects would exceed $1.7 million. Thus, a reduction in cooperation in conservation projects by these two landowners could be expected to result in a corresponding environmental loss to society of more than $1.7 million. In addition, these landowners have indicated that they will not allow outside individuals, agencies or organizations to monitor, investigate, or collect data about native plants on their lands. In qualitative terms, the total loss to society as a result of reduced cooperation in conservation projects could be considered significant.

(43) *Comment:* The DEA fails to consider economic impacts of critical habitat that result through interaction with Hawaii Land Use Law. Critical habitat could result in changes to zoning under State law. There is an overriding directive under State law that endangered plant species are to be protected in the State's planning and zoning process. HRS § 205–2(e) states that Conservation Districts shall include areas necessary for conserving endangered species. HRS 195D–5.1 states that DLNR shall initiate amendments in order to include the habitat of rare species. Even if DLNR does not act, the Land Use Commission may initiate such changes, or they may be forced by citizen lawsuits. Areas for endangered species are placed in the protected subzone with the most severe restrictions. While existing uses can be grandfathered, downzoning will prevent landowners from being able to shift uses in the future, will reduce market value, increase property tax, and make the land unmortgageable. Although the Service acknowledges that there could be substantial indirect costs relating to redistricting of land to the Conservation District, several commentators disagreed with the characterization of these costs as ''minor'' and with the statement that the probabilities of redistricting is ''slight to small.''

Our Response: In our economic analysis we indicated that about 8,770 ha (21,670 ac) of Agricultural lands would be included in the designation, of which 4,443 ha (10,980 ac) is privately owned. However, in this final rule, we have designated critical habitat on only 5,170 ha (12,744 ac) of Agricultural lands on Maui and Kahoolawe; the remaining Agricultural lands were excluded from the final designation pursuant to section 4(b)(2). Of this, approximately 15 percent, or 794 ha (1,960 ac), is owned by private landowners. The primary activity that takes place on privately-owned agriculturally-zoned land is ranching. The economic analysis found that reduction in land values that would be caused by redistricting privately owned land from Agricultural to Conservation District ranges from $1,000 to $10,000 per acre. Since 1,960 acres of Agricultural land are privately owned, if all such lands were redistricted, the total loss would range from $1,960,000 to $19,600,000. Even if a landowner has no plans to sell the land, the loss in land value due to redistricting could reduce potential mortgage financing. However, as discussed in the economic analysis, the redistricting of all Agricultural land to Conservation is a worst-case scenario, and one which is not envisioned for several reasons.

HRS section 195D–5.1 states that the Department of Land and Natural Resources (DLNR) ''shall initiate amendments to the conservation district boundaries consistent with section 205–4 in order to include high quality native forests and the habitat of rare native species of flora and fauna within the conservation district.'' HRS section 205–2(e) specifies that ''conservation districts shall include areas necessary for * * * conserving indigenous or endemic plants, fish and wildlife, including those which are threatened or endangered * * *'' Unlike the automatic conferral of State law protection for all federally listed species (*see* HRS 195D–4(a)), these provisions do not explicitly reference federally designated critical habitat and, to our knowledge, DLNR has not proposed amendments in the past to include all designated critical habitat in the Conservation District. Nevertheless, according to the Land Division of DLNR, DLNR is required by HRS 195D–5.1 to initiate amendments to reclassify critical habitat lands to the Conservation District (Deirdre Mamiya, Administrator, Land Division, in litt. 2002).

State law only permits other State departments or agencies, the county in which the land is situated, and any person with a property interest in the land to petition the State Land Use Commission (LUC) for a change in the boundary of a district. HRS section 205–4. The Hawaii Department of Business, Economic Development & Tourism's (DBEDT) Office of Planning also conducts a periodic review of district boundaries taking into account current land uses, environmental concerns and other factors and may propose changes to the LUC.

The State Land Use Commission determines whether changes proposed by DLNR, DBEDT, other state agencies, counties or landowners should be enacted. In doing so, State law requires LUC to take into account specific criteria, set forth at HRS 205–17. While the LUC is specifically directed to consider the impact of the proposed reclassification on ''the preservation or maintenance of important natural systems or habitats,'' it is also specifically directed to consider five other impacts in its decision: (1) ''maintenance of valued cultural, historical, or natural resources;'' (2) ''maintenance of other natural resources relevant to Hawaii's economy, including, but not limited to, agricultural resources;'' (3) ''commitment of state funds and resources;'' (4) ''provision for employment opportunities and economic development;'' and (5) ''provision for housing opportunities for all income groups, particularly the low, low-moderate, and gap groups.'' HRS 205.17. Approval of redistricting requires six affirmative votes from the nine commissioners, with the decision based on a ''clear preponderance of the evidence that the proposed boundary is reasonable.'' HRS 205–4.

Thus, even if all federally designated critical habitat is petitioned for redistricting, the likelihood of redistricting will vary parcel by parcel. While the LUC may redistrict some parcels, it is unlikely that lands with a high economic value to the community, such as lands with significant State investments, prime agricultural land, land planned for the economic and community development, and land planned for the provision of housing, would be redistricted. By way of illustration, in the last State district boundary review only five privately owned parcels were redistricted to Conservation even though several hundred parcels were proposed for redistricting (Addendum). While concern has been expressed that a third party would challenge a decision by the LUC not to redistrict a critical habitat parcel in State court, State courts have been deferential to the LUC decisions if they are supported by the record, consistent with statutory provisions, and not affected by errors. *See, e.g., Kilauea Neighborhood Ass'n.* v. *Land Use Comm'n.* 751 P.2d 1031, 1035 (Haw. Ct. App. 1988) (finding that, although LUC's findings were poorly drawn, the record provided sufficient support for the decision); *Outdoor Circle* v. *Harold K.L. Castle Trust Estate,* 675 P.2d 784, 793 (Haw. Ct. App. 1983) (upholding LUC's decision as consistent

with statutory provisions and not affected by errors).

(44) *Comment:* A commenter stated that the DEA fails to consider economic impacts of critical habitat that result through interaction with State law, specifically Hawaii Environmental Impact Statement Law. HRS 343–5 applies to any use of conservation land, and a full Environmental Impact Statement is required if any of the significance criteria listed in HAR 11–200–12 apply. One of these criteria is that an action is significant if it ''substantially affects a rare, threatened or endangered species or its habitat.'' This will result in costly procedural requirements and delays. Another commenter expressed concerns that the Service may get involved in county permitting processes (as it did when Ulupalakua Ranch requested a Special Use Permit from the County of Maui for telecommunication purposes). Multiple commenters also stated the following: The DEA fails to evaluate the practical effect critical habitat designation will have on development. The draft fails to quantify the indirect costs that critical habitat designation could cause by making the process of obtaining State and county permits for development more difficult, expensive, and time consuming. Similarly, it should take into account the delays and additional cost to ensure compliance with Federal regulations. Special Management Area permits administered by Maui County as required by Hawaii's Coastal Zone Management Act will be harder to get, will result in delays, will cause a decline in property values and may make it impossible to develop. This economic impact disappears because the DEA's bottom line erroneously counts only so-called ''direct'' costs of consultation.

Another commenter also stated that the Service has taken the position in other States that it has a right to intervene in local land use proceedings if they affect endangered species on private property. For example, the Service petitioned the local zoning board in Arizona to postpone approval of a rezoning petition pending a survey to determine the extent to which an endangered plant was present on the property even though no Federal approval was being sought. The failure of the Service to address this type of activity in the DEA is a fundamental error of the analysis.

Our Response: Adverse impacts on development, including, but not limited to, delays for additional studies and agency reviews, increased costs for environmental studies, increased risk of project denials, increased risk of costly mitigation measures, increased risk of litigation over approvals, are not expected since there are no known development plans within the designation. Furthermore, the following factors make future development projects in the proposed critical habitat unlikely: (1) As modified, approximately 80 percent of the proposed critical habitat is in Conservation District where development is severely limited; (2) the approximately 20 percent of the proposed critical habitat in the Agricultural district is in remote areas, areas lined with gulches or steep cliffs, or areas with limited access to water; (3) there are no known plans for development within the final critical habitat; and (4) most of the land designated in the Special Management Area is also within the Conservation District.

(45) *Comment:* The DEA fails to consider economic impacts of critical habitat that result through interaction with State law, specifically the State Water Code. HRS 174C–2 states ''adequate provision shall be made for protection of fish and wildlife.'' HRS 174C–71 instructs the commission of Water Resource Management to establish an in-stream use protection program to protect fish and wildlife. Another commenter was concerned that critical habitat is proposed in watershed areas in which stream or irrigation system water flows. This commenter also stated the following: The proposed rule states that activities such as watershed alteration or water diversion may trigger section 7 consultations if there is Federal involvement. If the ability to divert or take water from these sources or systems is restricted or limited, the impact would be far reaching and affect all lands served by such water sources or systems. The Service has an obligation to thoroughly investigate this issue and refrain from designating critical habitat until it has determined whether its actions will affect water use and balance this against any benefit to the species.

Our Response: No costs are expected to occur from such impacts to water systems, because none of the listed plants are aquatic and therefore would not cause a reduction in water diversion. In addition, water infrastructure is considered a manmade feature and therefore its operation and maintenance are not subject to critical habitat provisions of section 7, because these features and structures normally do not contain, and are not likely to develop, any primary constituent elements.

(46) *Comment:* A commenter expressed concerns that opponents of water diversions may use critical habitat as a tool to delay, and effectively stop, many worthwhile water diversion projects.

Our Response: Maui County and Department of Water Supply (DWS) submitted specific information regarding planned projects in the proposed critical habitat during the public comment period. Possible and planned projects by the DWS include water source development in Unit B2; construction of a water reservoir adjacent to Unit L; access and intake improvements in Unit L; and repair and maintenance of existing flumes in Unit L. As noted earlier, the Service removed Unit B2 from the final designation. Thus, no section 7 costs would be anticipated to result from future DWS projects in this area. Moreover, most of the identified DWS projects in Unit L involve repair and maintenance of existing manmade features and structures, and as such, would not be subject to section 7 consultation. However, to the extent that the planned improvements go beyond repair and maintenance and would be subject to section 7 consultation caused by Federal funding or permitting, the DEA's estimate of zero to two consultations reasonably reflects the potential number of section 7 consultations over the next 10 years (see Chapter VI, Section 3.k. of the DEA). The DEA estimates that the consultations could cost up to $68,000 with project modifications that could range up to $200,000.

(47) *Comment:* Several commenters stated that the DEA focuses primarily on the costs of critical habitat and lacks a thorough benefits analysis. It does not include the benefits of watershed protection and improvement or protection of other stream and riparian biota; the value of the listed plants as an indicator of ecological health; the value of protecting culturally significant species; the value that Hawaii's people place on conservation of Hawaiian plants; and the benefits of keeping other native species off the endangered species list, of maintaining water quality and quantity, of promoting ground water recharge, and of preventing siltation of the marine environment, thus protecting coral reefs. The Service cannot exclude land from critical habitat designation if it considers only the costs, and not the benefits, of critical habitat designation. In failing to discuss these benefits, the Service missed an opportunity to educate the public regarding the value of protecting native species and native ecosystems. The Service must use the tools available,

such as a study by the University of Hawaii (UH) Secretariat for Conservation Biology that estimated the value of ecosystem services, to quantify the benefits of critical habitat. Conversely, another commenter stated that the alleged benefits are entirely speculative and unquantifiable, and that the listed plants are of no use to anyone and lack commercial value. Another commenter points out that according to the DEA summary of costs and benefits, the benefits of designating critical habitat are ''difficult to estimate'' and are exceeded by the costs. Accordingly, the Service should exclude areas covered by the DEA from designation.

Our Response: There is little disagreement in the published economic literature that real social welfare benefits can result from the conservation and recovery of endangered and threatened species (Bishop 1978, 1980; Brookshire and Eubanks 1983; Boyle and Bishop 1986; Hageman 1985; Samples *et al.* 1986; Stoll and Johnson 1984). Such benefits have also been ascribed to preservation of open space and biodiversity (see examples in Pearce and Moran (1994) and Fausold and Lilieholm (1999)), both of which are associated with species conservation. Likewise, a regional economy can benefit from the preservation of healthy populations of endangered and threatened species, and the habitat on which these species depend.

Chapter VI, Section 6 of the DEA discusses potential benefits, both direct and indirect, that can result from the proposed designation. The DEA notes that the proposed designation can create ecological and cultural benefits such as the ones mentioned in the above comment—*e.g.*, ethnobotanical value of plants to the Native Hawaiians and social welfare benefits of ecological improvements. However, the DEA also indicates that these benefits are not quantified due to lack of information available on: (1) Quantified data on the value of the Maui and Kahoolawe species, and (2) quantified data on the change in the quality of the ecosystem and the species as a result of the designation. The DEA, however, does not conclude that the benefits are exceeded by the costs. Instead, it discusses the benefits that could result from critical habitat designation in qualitative terms.

While section 4(b)(1)(A) of the Act stipulates that listing determinations must be made solely on the basis of biological evidence, section 4(b)(2) of the Act, which calls for the establishment of critical habitat for all listed species if it is prudent and determinable, adds that the Secretary should take into consideration the economic impact of the designation and any other relevant impacts before specifying any particular area as critical habitat. Hence, an economic analysis is part of the process of designating critical habitat. Section 4(b)(2) of the Act provides the Secretary with broad discretion to take into consideration the economic impacts of any proposed critical habitat designation and exclude areas where she finds that the benefits of exclusion outweigh the benefits of designation.

The Secretary may exclude any area from critical habitat if she determines that the benefits of exclusion outweigh the benefits of specifying such area as part of the critical habitat, unless she determines, based on the best scientific and commercial data available, the failure to designate such area as critical habitat will result in the extinction of the species concerned (16 U.S.C. 1533(b)(2)).

Thus, the Secretary is not required to find that the benefits of inclusion outweigh the costs of inclusion before designating an area, nor is the Secretary required to exclude an area from critical habitat if she determines that the benefits of exclusion outweigh the benefits of inclusion. Rather, the Act provides the Secretary with the discretion to take economic and other considerations into account when designating critical habitat.

As such, the DEA and the Addendum serve to illustrate possible impacts that can result from the designation, whether in the form of costs or benefits. However, the DEA and the Addendum are not intended to provide a comprehensive analysis of the benefits that could result from section 7 of the Act in general, or of critical habitat in particular. In short, the Service believes that the benefits of critical habitat designation are best expressed in biological terms that can be weighed against the expected costs of the rulemaking. The DEA and the Addendum simply provide information for the Secretary to exercise her discretion, but do not provide definitive conclusions or recommendations as to what areas, if any, should be excluded from the final designation.

Finally, although the UH study does value ecosystem services, it has limited applicability for valuing the benefits of the proposed critical habitat designation for the plants for a number of reasons. First, the UH study had a different purpose, which was to estimate the total value of environmental benefits provided by the entire Ko'olau Mountains on the island of Oahu versus the value of the more limited benefits provided by the proposed critical habitat for the plants on the islands of Maui and Kahoolawe. Consistent with its purpose, the UH study provided no estimates of the changes in environmental conditions resulting from changes in land and stream management due to critical habitat designation.

Furthermore, many of the assumptions and much of the analysis in the UH study are not transferable to the economic analysis for the plants' critical habitat. For example, the value of water recharge in the UH study reflects projected water supply and demand conditions on Oahu—an island ¾ of the size of Maui but with a population of nearly ten times that of Maui. Also, the UH benefit analysis of reducing soil runoff is unique to three valleys that drain through partially channelized streams in urban areas into the manmade Ala Wai Canal. Since this canal was designed with inadequate flushing from stream or ocean currents, it functions as an unintended settling basin that must be dredged periodically. In addition, the recreational and ecotourism values provided in the UH study apply to areas that are accessible to most hikers, which is not the case with significant portions of the plants'critical habitat. Significant portions of the plants' critical habitat units are in mountainous range with steep slopes and difficult access and on coastal cliffs.

(48) *Comment:* Critical habitat does not benefit ecotourism by creating new special places for people to visit, as the DEA suggests. Rather, it helps to protect the special places that already exist from degradation, ensuring that they will be around in the future to attract future ecotourists. Moreover, the Service's subjective preference that commercial operators not feature visits to view threatened and endangered plants has no place in an objective economic analysis.

Our Response: Chapter VI, Section 6.b.(1) of the DEA indicates that the proposed critical habitat may enhance the appeal of ecotourism by providing a marketing dimension. However, the DEA also states that this benefit may be slight since these places may already be regarded as special due to the existing natural and cultural resources in the area.

(49) *Comment:* The DEA underestimates economic costs because they are limited to what is likely to occur within 10 years. Critical habitat designation is permanent and not automatically revised if there is new evidence of the benefits of

nondesignation, or if the species is delisted.

Our Response: A listed species is delisted when it is recovered or has become extinct. Recovery is defined as no longer needing the protections provided by the Act, which includes critical habitat. As such, when a species is delisted, its critical habitat would be simultaneously ''undesignated.''

Furthermore, a 10-year time horizon is used because many landowners and managers do not have specific plans for projects beyond 10 years. In addition, the forecasts in the analysis of future economic activity are based on current socioeconomic trends and the current level of technology, both of which are likely to change over the long term.

(50) *Comment:* The DEA dismisses concerns about impacts on the use of structures and features already in place in areas to be designated as critical habitat. The draft concedes that the lack of clarity can force landowners to incur costs to investigate the implications of the regulations. The estimate that this will only take 15–40 hours is too low given the size of the designated areas, the vagueness of the regulatory exclusion, and the real costs of obtaining development approvals.

In addition, the DEA's analysis of potential costs expected to be incurred by private landowners to investigate the implications of critical habitat on their lands is flawed, because the analysis fails to recognize that the cost to investigate the implications of CH are sunk costs associated with the designation process, not additional costs that the final designation would impose.

Our Response: The DEA recognized that some landowners might spend a great deal of time investigating the implications of critical habitat, while others might not spend any time. The costs reported in the DEA reflect a reasonable estimate of total costs for all landowners, based on an estimate of the number of landowners who are likely to investigate the implications of critical habitat. The Addendum revised this number upwards in response to public comment. However, on further reflection, the estimate contained in the DEA better reflects an average estimate for all affected landowners for the following reasons. The estimate takes into account whether their land is in areas that are unsuitable for development due to mountainous terrain and/or being in the Conservation District. The analysis also assumes an average cost per landowner to investigate the implications of critical habitat. Public comment did not offer an alternative estimate of time or costs that would support changing the estimate in the DEA. Thus the estimates of hours spent and costs incurred remain the same as they appear in the DEA.

(51) *Comment:* One commenter stated the following: The DEA fails to consider the economic impacts of listing and critical habitat that result through interaction with State law, specifically Hawaii's Endangered Species Act. The commenter suggested that *New Mexico Cattle Growers Association* v. *U.S. Fish and Wildlife Service* requires consideration of the impact of listing as well as the impact of designating an area as critical habitat. Instead, the analysis is expressly limited to the impact of Federal agency consultation under the jeopardy standard. Since Federal listing triggers listing under State law, the Service must consider the impact of take prohibitions under State law (and consequently Federal law, which prohibits destruction of plants in knowing violation of State law). Violations of these laws can trigger lawsuits.

Our Response: The DEA and the Addendum consider the economic impacts of section 7 consultations related to critical habitat even if they are attributable co-extensively to the listed status of the species. In addition, the DEA and the Addendum examine any indirect costs of critical habitat designation; however, where it is the listing of a species that prompts action at the State or local level, the impacts are not attributable to critical habitat designation. Take prohibitions under Hawaii law are purely attributable to a listing decision and do not occur because of critical habitat designations. There are not take prohibitions associated with the plants critical habitat.

(52) *Comment:* Multiple commenters opposed the designation of agricultural lands needed to support agriculture and ranching. They stated that critical habitat designation would reduce property values and the ability to develop lands that were previously planned for development. Approximately 77 percent of the proposed designated land is within the State Conservation District, which includes irrigation water essential to agriculture. The rest of the lands proposed for designation are in the State Agricultural District. Designation of agricultural lands could prevent a farmer or rancher from using those lands since the very nature of those uses would in all likelihood entail cutting, uprooting, or injuring plants to a certain extent. The DEA fails to examine the economic impact of a landowner not being able to use his own land for fear of injuring a species he doesn't even recognize. No protection is afforded to farmers who unwittingly ''harm'' the designated critical habitat. A careful cost-benefit analysis should conclude that agricultural lands should be excluded.

Our Response: There are no take provisions associated with critical habitat. The Act requires only that Federal agencies consult with the Service to ensure that activities they fund, authorize, or carry out do not result in destruction or adverse modification of critical habitat. Because consultation under section 7 only applies to activities that have Federal involvement, the designation of critical habitat does not afford any additional protections for listed species with respect to strictly private activities. As such, designation of critical habitat on agricultural lands would not prevent a private farmer or rancher from farming or ranching on their land, unless the activity had Federal involvement, such as through participation in federally sponsored agricultural or ranching programs.

Chapter VI, Section 3.g. of the DEA presents estimates of section 7 costs associated with participation in federally sponsored agricultural or ranching related programs, such as Farm Bill programs administered by NRCS. The DEA bases its estimate of two to eight consultations over the next 10 years on the amount of Agricultural land contained within the proposed designation; number of past projects located within the area proposed for designation; and the possibility that some landowners could decide not to participate in future programs to avoid Federal involvement in their activities.

The Service reduced the amount of Agricultural land designated from 29,175 ac (11,806 ha) to 21,670 ac (8,770 ha), a reduction of 25 percent. The designation contains approximately 10,980 ac (4,443 ha) of Agricultural land owned by those most likely to participate in NRCS programs. However, the majority of this land, approximately 9,028 acres, is owned by two landowners who indicated during public comment that they will not participate in future NRCS programs if their land was designated as critical habitat. Moreover, as noted in the DEA, not all of the Agricultural land designated is in active agricultural use. Finally, competition for NRCS funding is strong. Based upon the final critical habitat designation and the new information, the Addendum adjusts the direct section 7 costs accordingly. The Addendum estimates that the consultation cost can range from $0 to

$41,200, with a project modification cost ranging $0 to $100,000.

Other indirect impacts that could result from the designation of critical habitat are discussed in Chapter VI, Section 4 of the DEA and Section 5 of the Addendum. First, the critical habitat designation may reduce property value of these Agricultural lands. In the worst case scenario, one which is not envisioned, reduction in land values due to redistricting all Agricultural land to the Conservation District could range from $11 million to $110 million. In addition, critical habitat could result in the cessation of existing agricultural activities. While the likelihood of this being mandated as a result of critical habitat designation is low, the estimated costs resulting from stopping all ranching activities within the designation ranges form $110,000 to $825,000 per year.

(53) *Comment:* Many commenters stated that the DEA fails to adequately assess the scope of indirect costs associated with critical habitat designation. Indirect impacts cannot be dismissed just because it is difficult to assign a dollar value to them. Without acknowledging the full scope of direct and indirect costs, the Service cannot complete an accurate final determination of critical habitat. Another commenter also stated that the DEA should be amended to properly reflect all economic impacts, including the various indirect impacts, which would clearly show that the economic costs of critical habitat designation are significantly higher than the benefits.

Our Response: Chapter VI, Section 4 of the DEA and Section 5 of the Addendum discuss various indirect impacts that can result from the designation. There is considerable uncertainty on whether any or all of these indirect impacts may occur, as they depend upon actions and decisions by entities other than the Service under circumstances for which there is limited or no history that can be used to determine the probability of different outcomes. Thus, based on the available information, these impacts were discussed qualitatively in the DEA and where possible, estimates were given of worst-case scenarios for illustrative purposes.

(54) *Comment:* Several commenters stated that critical habitat designation has the potential to decrease the amount of available hunting lands and game animals. Governmental officials seem to value plants and insects more than hunting, which is an important family and cultural tradition, a means of subsistence, and a way of life. Members of all ethnic groups hunt and depend on subsistence activities as a real part of their income. Hunting also contributes to the economy via money spent on pet foods, inter-island trips, gasoline, supplies, etc. Additionally, DLNR will lose money as the demand for hunting licenses and tag fees dwindles. The DEA does not adequately reflect the costs associated with management of game mammals and loss of hunting lands. Another commenter questioned why a cost was associated with project modifications to the management of game hunting on State managed lands because Maui does not have any State hunting areas that are managed to maintain or enhance game mammal populations. The commenters also questioned the methodology used to estimate the project modification cost.

Our Response: Chapter VI, Section 3.a.(2) and Section 4.a. of the Addendum discuss the direct economic impact of critical habitat designation on federally funded game management activities by estimating the direct section 7 costs associated with consultation and project modifications. The DEA makes the assumption that the cost of past project modifications only incorporates the portions of the hunting units that overlap with the occupied proposed critical habitat. However, information received during public comment noted that the prior consultation already modified the State's proposed game mammal program to address potential impacts to habitat everywhere on the island, including occupied and unoccupied habitat and areas inside and outside of critical habitat designation, based on the understanding that increasing game mammal populations in one location where the plants are not present may cause those mammals to move to areas where the plants are present and cause destruction. Upon further review of past consultations and past project modifications, the project modification costs are now estimated at $23,000 to $37,000. As noted in the DEA, because Maui does not have any State hunting areas that are managed to maintain or enhance game mammal populations, project modifications are anticipated to be similar to those in the past. They are not anticipated to include closure of hunting areas. In addition, as noted in the DEA, DLNR is likely to avoid costly project modifications by using Federal funds for game management projects that do not adversely affect listed species or their critical habitat, and if needed use only State funds on projects that the Service believes could have adverse impacts.

Chapter VI, Section 4.b. of the DEA and Section 5.a. of the Addendum discuss the potential indirect impact of critical habitat on the management of game mammals. The DEA notes that section 7 of the Act by itself does not require DLNR to manage State hunting lands to protect critical habitat; assure the survival and conservation of listed species, or participate in projects to recover species for which critical habitat has been established. Moreover, the DEA notes that critical habitat designation does not require: (1) Creating any reserve, refuge, or wilderness areas; (2) fencing for any reason; (3) removing ungulates; or (4) closing areas to hunters. However, the DEA recognizes that a change in game-management strategy is possible as a result of a lawsuit or as a voluntary decision by DLNR. For illustrative purposes, Chapter VI, Section 4.b. of the DEA and Section 5.a. of the Addendum present potential costs that could result if DLNR removed areas within the designation from the State-managed hunting units. Assuming that about half of those who hunt game mammals on the affected lands were to give up hunting, then hunting activity on Maui could drop by about 14.5 percent. This drop in hunting activity would translate into a decrease in annual economic activity related to hunting on Maui of about $290,000 in direct sales (14.5 percent of $2 million); $510,000 in total direct and indirect sales (14.5 percent of $3.5 million); nine jobs (14.5 percent of 60 jobs); and $170,000 in income (14.5 percent of $1.2 million). However, the decrease in expenditures by the displaced hunters would probably be spent on other recreational activities, goods, and services, so these figures are likely to overstate the economic costs. In addition to the change in economic activity discussed above, a reduction in hunting activity in critical habitat would also result in a loss in value or benefit to hunters (consumers' surplus). Section 5.a. of the Addendum estimates this loss in value at $150,000 annually and recognizes that benefits derived from recreational activities that replace game mammal hunting would partially offset this loss.

(55) *Comment:* Three parcels (TMK (2) 1–8–001:003, TMK (2) 3–1–001:004, and TMK (2) 3–1–002:011) should be excluded from designation, because the DEA fails to establish that the benefits of including these parcels in the designation outweigh the costs of including these parcels in the designation.

Our Response: The Service removed two of the three parcels mentioned in the comment—*i.e.*, TMK (2) 3–1–001:004 and TMK (2) 3–1–002:011 from the proposed designation. The

remaining parcel—*i.e.*, TMK (2) 1–8–001:003—is approximately 710 acres (4 ha) in the Agricultural District, and this would remain within the designation. Chapter VI, Section 3.g. of the DEA and Section 4.e. of the Addendum discuss activities on Agricultural land and specifically recognizes that some of the State managed Agricultural land is leased out to private entities as pasturage. However, no direct section 7 costs involving these leases are anticipated because there is no known Federal involvement.

While section 4(b)(1)(A) of the Act stipulates that listing determinations must be made solely on the basis of biological evidence, section 4(b)(2) of the Act, which calls for the establishment of critical habitat for all listed species if it is prudent and determinable, adds that the Secretary should take into consideration the economic impact of the designation and any other relevant impacts before specifying any particular area as critical habitat. Hence, an economic analysis is part of the process of designating critical habitat. Section 4(b)(2) of the Act provides the Secretary with broad discretion to take into consideration the economic impacts of any proposed critical habitat designation and exclude areas where she finds that the benefits of exclusion outweigh the benefits of designation.

The Secretary may exclude any area from critical habitat if she determines that the benefits of exclusion outweigh the benefits of specifying such area as part of the critical habitat, unless she determines, based on the best scientific and commercial data available, that the failure to designate such area as critical habitat will result in the extinction of the species concerned (16 U.S.C. 1533(b)(2)).

Thus, the Secretary is not required to find that the benefits of inclusion outweigh the costs of inclusion before designating an area, nor is the Secretary required to exclude an area from critical habitat if she determines that the benefits of exclusion outweigh the benefits of inclusion. Rather, the Act provides the Secretary with the discretion to take economic consideration into account when designating critical habitat.

As such, the DEA and the Addendum serve to illustrate possible impacts that can result from the designation, whether in form of costs or benefit. They provide information for the Secretary to exercise her discretion, but do not provide definitive conclusions or recommendations as to what areas, if any, should be excluded from the final designation.

(56) *Comment:* While the Service has stated that critical habitat affects only activities that require Federal permits or funding, and does not require landowners to carry out special management or restrict use of their land, they fail to address the breadth of Federal activities that affect private property in Hawaii and the extent to which private landowners are required to obtain Federal approval before they can use their property. These requirements extend to all State agencies using Federal funds in connection with a proposed action and community actions for which Federal approval or review is necessary. For example, if the Federal government approves eligibility for flood insurance, flood plain development programs shall become subject to consultations under the Act. Federal agencies such as the U.S. Department of Agriculture and the Federal Farm Services Agency (FFSA) have numerous programs that provide funds or other assistance to farmers and ranchers in the form of loans, grants, loan deficiency, and subsidy payments for certain commodities, marketing assistance, disaster assistance, and other financial, technical, and educational assistance. Participation in any such programs would be subject to section 7 consultation, thus making Federal assistance unavailable to the types of operations that these programs are designed to assist.

Our Response: The analysis in the DEA, as revised by the Addendum, is based on a review of all ''reasonably foreseeable'' projects, land uses, and activities that may be directly affected by the implementation of section 7 for the plants. ''Reasonably foreseeable'' projects, land uses, and activities are defined in the DEA as those which are: (1) Currently authorized, permitted, or funded; (2) proposed in plans currently available to the public; or (3) projected or likely to occur within next 10 years based on (a) recent economic or land-use trends, development patterns, evolving technologies, competitive advantages, etc., and (b) limits imposed by land-use controls, access, terrain, infrastructure and other restrictions on development. After determining the ''reasonably foreseeable'' projects, land uses, and activities that could affect the physical and biological features of the proposed critical habitat units, the next step in the analysis was to determine Federal involvement. Thus, the DEA does not evaluate all potential activities with Federal nexus; instead, the DEA is limited to those activities that were ''reasonably foreseeable.'' The results of this analysis are presented in Table VI–3 in the DEA and Table Add-2 in the Addendum.

(57) *Comment:* Two commenters wrote that lands in Urban, Agricultural, and Rural Districts are designated, used, and intended for a wide variety of land use activities. These commenters stated that there is a much greater likelihood, therefore, that critical habitat designation will have an adverse economic impact on these landowners.

Our Response: None of the critical habitat units are in the Urban or Rural District. In fact, 86 percent of the critical habitat designation is in Conservation District and 14 percent in Agricultural District. As discussed above, designation of the Agricultural lands may result in direct section 7 costs through federally sponsored agricultural or ranching related programs, such as Farm Bill programs administered by NRCS. The DEA bases its estimate of two to eight consultations over the next 10 years on the amount of Agricultural land contained within the proposed designation, the number of past projects located within the area proposed for designation, and the possibility that some landowners could decide not to participate in future programs to avoid Federal involvement in their activities.

(58) *Comment:* Several commenters stated that although the Service has expressed that designation of critical habitat does not create a reserve, refuge, or wilderness area; require fencing for any reason; close off areas to hunters, hikers, or other land users; or create a land management plan, many are concerned that critical habitat designation could result in limitations or special management requirements (such as fencing, removal of grazing animals, or control of invasive species) being established on private lands at great expense to the private and public. The Service's own recovery plans for many of the species in the proposed rule specifically identify cattle grazing as a potential threat to the species or their habitats. Many feel that it is likely that private party litigation will force the implementation of ''special management considerations or protection.'' An example of this is the worrisome precedent of *Palila* v. *Hawaii Department of Land and Natural Resources* in which the Sierra Club Legal Defense Fund sued the State of Hawaii under the Endangered Species Act and resulted in a Federal court order specifying that sheep and goats should be permanently removed from critical habitat designated for palila on the Big Island. The argument against this case being relevant for the plants critical habitat is not persuasive when it argues that palila cases are irrelevant to

Hawaii ESA law because the Federal Act defines ''take'' as ''harm'' while the State law defines ''take'' as ''injure.'' ''Harm'' and ''injure'' are generally synonymous. The cost of such special management should be considered prior to a final determination on the proposed designations. Where costs are likely to outweigh the benefits of the proposed designation, designation of critical habitat should be determined not to be prudent, or at a minimum, areas proposed for designation should be significantly reduced so that any special management measures that may eventually be mandated through litigation are of a scale that is reasonable and cost-effective to implement.

Another commenter expressed concerns that the proposed critical habitat would bring private party lawsuits resulting in mandated protection for critical habitat. Another commenter also stated that in Hawaii it has long been established that landowners own all feral animals on their property. The commenter expressed concerns that plaintiffs who seek to compel a private landowner to spend money to protect critical habitat could argue that the landowner has a positive obligation to ensure that such animals do not harm the habitat.

Our Response: Section 4(a)(3)(A) of the Act directs the Secretary to designate critical habitat to the ''maximum extent prudent and determinable.'' Critical habitat is not prudent when one or both the following situations exist: (1) A species is threatened by taking or other human activity and identification of critical habitat would increase the degree of threat; or (2) designation would not be beneficial to the species (50 CFR 424.12(a)(1)). Thus the costs of designation are not considered in analyzing whether critical habitat is prudent. However, such costs are considered under section 4(b)(2) of the Act, which directs the Secretary to take into consideration the economic and other impacts of designation and authorizes the Secretary to exclude any area if she determines that the benefits of exclusion outweigh the benefits of designating it as critical habitat, unless it will result in extinction of the species.

The Act does not obligate landowners to manage their land to protect critical habitat, nor would landowners and managers be obligated under the Act to participate in projects to recover a species for which critical habitat has been established. However, Chapter VI, Section 4.c. of the DEA does discuss the potential mandate for conservation management pursuant to litigation and the resulting costs for the proposed designation on Maui. In addition, Chapter VI, Section 4.f. of the DEA, discusses the potential for adverse impacts on development, including delays for additional studies and agency reviews, increased costs for environmental studies, increased risk of project denials, increased risk of costly mitigation measures, increased risk of litigation over approvals, etc. The DEA concludes that it is impossible to quantify these potential costs, because there are no known development plans within the proposed designation. Furthermore, the following factors make future development projects in the proposed critical habitat highly unlikely: (1) 86 percent of the critical habitat is in Conservation District where development is severely limited; (2) the approximately 14 percent of the critical habitat in the Agricultural District is in remote areas, areas lined with gulches or steep cliffs, or areas with limited access to water; (3) there are no known plans for development within the designation; and (4) most of the critical habitat in the Special Management Area is also within the Conservation District. While it is conceivable that there may initially be an increase in subsequent lawsuits related to the critical habitat designation, it is not possible to predict their number, degree of complexity, chance of success, or any other associated effect due to scant historical evidence for the plants.

(59) *Comment:* Several commenters were concerned that critical habitat designation will lead to unnecessary and costly litigation. Another commenter was concerned about the likelihood of private party lawsuits limiting current ranch operations.

Our Response: As discussed in the DEA and the Addendum, an undetermined probability exists that a Federal or State court could mandate certain indirect impacts as a result of critical habitat. However, it is beyond the scope of the economic analysis to assess the legal merits of the arguments for or against the various indirect impacts, to assess the probability that a lawsuit will be filed, and, if filed, to identify possible outcomes of a court decision and the associated probabilities. However, whenever possible, the DEA and the Addendum present the worst-case scenario of the costs associated with the potential outcomes of third party lawsuits.

(60) *Comment:* ML&P believes that designation of critical habitat would adversely impact the value of agricultural lands and lands proposed for future development, reduce the collateralized value of land holdings, and (due to State and county law) reduce the ability to develop lands previously planned for development. The impacted lands include areas described in the proposed units A, C1, C2 and C3.

Our Response: As discussed above, the Service removed Units C1 and C2 and reduced Units A and C3. After this modification, less than one acre of ML&P's land in Units A and C3 remains within the designation. As such, minimal impacts are anticipated for ML&P's Agricultural land in Units A and C3.

(61) *Comment:* The Maui County Department of Water Supply provided the following information on planned projects occurring in proposed units L, G, and B2. These projects include access improvements, intake improvements, reservoir design and construction, well construction, flume repair and maintenance, water distribution system maintenance, and identification of potential sources for future groundwater. Whether these or other projects would involve Federal lands, funding, or permits, it is important that water treatment plants, sources, and collection and distribution systems can continue to be established and maintained within these areas where they are needed for hydrogeological and security reasons.

Our Response: Maui County and Department of Water Supply (DWS) submitted specific information regarding planned projects in the proposed critical habitat during the public comment period. Possible and planned projects include water source development in Unit B2, construction of a water reservoir adjacent to Unit L, access and intake improvements in Unit L, and repair and maintenance of existing flumes in Unit L. As noted earlier, the Service removed Unit B2 from the final designation. Thus, no section 7 costs would be anticipated to result from future DWS projects in that area. Moreover, most of the identified DWS projects in Unit L involve repair and maintenance of existing manmade features and structures, and as such, would not be subject to section 7 consultation. However, to the extent that the planned improvements go beyond repair and maintenance and would be subject to section 7 consultation due to Federal funding or permitting, the DEA's estimate of zero to two consultations reasonably reflects the potential number of section 7 consultations over the next 10 years (see Chapter VI, Section 3.k. of the DEA). The DEA estimates that the consultations can cost up to $68,000 with project modification that can range up to $200,000.

(62) *Comment:* Ulupalakua Ranch expressed concerns that the proposed critical habitat will: (1) Limit development of diversified agricultural operations due to the Ranch's interest in Federal cost share programs; (2) cause a loss in revenue; (3) create economic hardship resulting from increased expenses to counter trespassing caused by increased curiosity over critical habitat lands; and (4) lower economic returns and job loss due to critical habitat dividing up sections of the ranch, thus leading to inefficiency.

Our Response: Chapter III of the DEA notes that section 7 of the Act requires Federal agencies to consult with the Service to ensure that activities they fund, authorize, or carry out do not result in destruction or adverse modification of critical habitat. Because consultation under section 7 only applies to activities that have Federal involvement, the designation of critical habitat does not afford any additional protections for listed species with respect to strictly private activities.

Chapter VI, Section 3.g.(2) of the DEA and Section 4.e. of the Addendum present estimates of direct section 7 costs associated with participation in Federal cost-share programs with NRCS. The Addendum estimates that total consultation costs for all projects in the critical habitat designation range from $0 to $41,200, while project modification costs range from $0 to $100,000. The DEA and the Addendum both note that projects sponsored by NRCS programs are generally beneficial in nature and are likely to involve minimal project modifications. However, the DEA and the Addendum recognize that a landowner could decide to forego Federal funding and cancel the contract with NRCS to avoid making modifications identified through the section 7 consultation process. If Ulupalakua Ranch were to be one of the anticipated consultations over the next ten years, and if the section 7 consultation process resulted in project modifications that would limit the development of diversified agricultural operations, then Ulupalakua Ranch could avoid these project modifications by foregoing Federal funding, thus removing the Federal involvement. The cost of project modifications in that case would be the total amount of Federal funding foregone. If no Federal involvement exists, there can be no direct section 7 costs associated with critical habitat designation on Ulupalakua Ranch lands.

The remaining three concerns raised above by Ulupalakua Ranch, specifically that critical habitat designation will cause loss in revenue, create economic hardship resulting from increased expenses to counter trespassing caused by increased curiosity over critical habitat lands, and lower economic returns and job loss caused by critical habitat dividing up sections of the ranch, are concerns about indirect impacts of critical habitat designation.

There is considerable uncertainty about whether any or all of these indirect impacts may occur, as they depend upon actions and decisions by entities other than the Service under circumstances for which there is limited or no history that can be used to determine the probability of different outcomes. To the extent possible, the possible costs associated with these impacts are discussed in Chapter VI, Section 4 of the DEA and Section 5 of the Addendum. However, based on the limited information available, it is not possible to determine the probability that any of these impacts will actually occur as a result of critical habitat designation.

(63) *Comment:* The Department of Hawaiian Homelands (DHHL) opposes the designation of critical habitat on their land in Unit E and H because the currently degraded land is slated for development of homes for native Hawaiian beneficiaries. DHHL further noted that critical habitat designation will cause significant economic harm, because: (1) The designation of critical habitat would require hundreds of future beneficiaries to conduct an environmental assessment and section 7 consultation in order to construct homes and prepare ground for farming; (2) the identified areas have already been subdivided into individual lots and DHHL does not have the authority to retroactively impose management plans on individual lessees, meaning that any regulatory impact will fall on individual lessees; (3) DHHL's homesteading program uses Federal programs to guarantee and insure the mortgages of homesteaders; (4) Federal funds may be used construct site improvements and homes; and (5) to the extent that the use of these programs triggers consultation under section 7, lessees will be subject to additional filing requirements, delays in homebuilding, possible additional expenditures, and limitations on property use. DHHL supports the proposed designations in areas that are not subject to homestead development, such as the cliff face found in unit G4.

Our Response: As discussed earlier, the Service reduced Units E and H to exclude certain areas for biological reasons, including DHHL land subject to homestead development. As such, possible impacts discussed in the comment are not expected.

(64) *Comment:* The Service did not adequately address the takings of private property as a result of designating critical habitat for endangered plants on Maui. If the critical habitat proposal would require reducing water diversions from any stream, the Service should investigate whether that would take anyone's vested water rights. In addition, if the proposed designation of critical habitat precipitates conversion of agricultural lands to conservation land that has no economically beneficial use, then the Federal and State governments will have taken private property. In addition, the government may also take property by excessive regulation as was evidenced in *Lucas* v. *South Carolina Coastal Council,* 505 U.S. 1003 (1992).

Our Response: As noted above, none of the plants are stream-dependent for their survival and therefore would not cause a reduction in water diversion. Also, Chapter VI, Section 4.e. of the DEA, the Addendum and our response to comment 43 address costs involved in redistricting lands proposed for critical habitat designation from the Agricultural to the Conservation District. Any redistricting of land to Conservation and any corresponding loss of economically beneficial use would be decided by the State Land Use Commission, not the Service, based on an array of state laws and other factors, including the extent to which the proposed reclassification conforms to the applicable goals, objectives, and policies of the Hawaii state plan; the extent to which the proposed reclassification conforms to the applicable district standards; and the impacts of the proposed reclassification on the following: preservation or maintenance of important natural systems or habitats; maintenance of valued cultural, historical, or natural resources; maintenance of other natural resources relevant to Hawaii's economy; commitment of state funds and resources; provision for employment opportunities and economic development; and provision for housing opportunities for all income groups; and the representations and commitments made by the petitioner in securing a boundary change.

(65) *Comment:* A Federal nexus exists for the non-point source water discharge program. If water discharge into critical habitat does not meet water quality standards, a permit could be denied. The effect on agriculture may be devastating since some run-off from agricultural activities is avoidable.

Our Response: The State Department of Health Polluted Runoff Control Program and the State Office of

Planning, Coastal Zone Management Program, work together to address nonpoint source pollution through outreach and education and programs that utilize incentives. Under the Coastal Zone Act Reauthorization Amendments, Section 6217, the State is required to meet various conditions for approval of the State's Coastal Nonpoint Pollution Control Program by the U.S. Environmental Protection Agency. To meet these conditions, the State Department of Health is developing administrative rules to create Statewide enforceable policies and mechanisms to address nonpoint source pollution. These draft rules are currently the subject of public informational meetings. Public comments and suggestions received during these meetings will be considered before final rules are drafted and proposed to the Governor.

At the present time, there is no permit requirement for nonpoint source pollution. Moreover, the proposed rules regarding nonpoint source pollution make no reference to either water quality standards or to critical habitat. Until the State administrative rules are finalized, the economic impact caused by the interplay of nonpoint source pollution requirements and the designation of critical habitat is entirely speculative.

(66) *Comment:* The designation of critical habitat will impose costly procedural burdens on the Navy's ongoing efforts to clear ordnance at Kahoolawe. A careful analysis of the benefits and burdens of critical habitat designation may result in a determination that critical habitat designation on Kahoolawe is not prudent, especially in light of potential prescribed burns for clearing ordnance.

Our Response: Chapter VI, Section 3.e. of the DEA notes that November 2003 marks the end of the Navy's congressionally-mandated cleanup period. After that point, Kahoolawe Island Reserve Commission (KIRC) is likely to seek some form of Federal assistance. In the event that KIRC receives Federal funding in the future, the DEA estimates section 7 consultation costs at $10,400 to $78,500 including minor project modification costs (based on two to five consultations). However, as noted above, the Service reduced the designation on Kahoolawe for biological reasons, and the number of section 7 consultations over the next 10 years is expected to decrease to zero to three consultations as a result. As such, the Addendum revises future section 7 consultation costs to range from $0 to $47,100.

(67) *Comment:* Many commenters questioned the utility of critical habitat designation because it will not result in on-the-ground improvement of habitat or endangered species. Conversely, some commenters pointed out that critical habitat will prevent the Federal government from carrying out activities that destroy habitat or species in need of recovery and that it will benefit the people of Maui by preserving native forests, thus preventing erosion that pollutes water and smothers reefs.

Our Response: There is little disagreement in the published economic literature that real social welfare benefits can result from the conservation and recovery of endangered and threatened species (Bishop 1978, 1980; Brookshire and Eubanks 1983; Boyle and Bishop 1986; Hageman 1985, Samples *et al.* 1986; Stoll and Johnson 1984). Such benefits have also been ascribed to preservation of open space and biodiversity (see examples in Pearce and Moran (1994) and Fausold and Lilieholm (1999)), both of which are associated with species conservation. Likewise, a regional economy can benefit from the preservation of healthy populations of endangered and threatened species, and the habitat on which these species depend.

It is not feasible, however, to fully describe and accurately quantify these benefits in the specific context of the proposed critical habitat for the plants, because no quantified data on the value of the Maui and Kahoolawe species exists, and the Service is unable to provide specific data on the change in the quality of the ecosystem and the species as a result of the designation (for example, how many fewer ungulates will roam into the critical habitat, how many fewer invasive plants will be introduced as a result, and therefore how many more of the plants will be present in the area). The discussion presented in the DEA and in the Addendum provides examples of potential benefits, which derive primarily from the listing of the species, based on information obtained in the course of developing the economic analysis. It is not intended to provide a complete analysis of the benefits that could result from section 7 of the Act in general, or of critical habitat designation in particular. In short, the Service believes that the benefits of critical habitat designation are best expressed in biological terms that can be weighed against the expected cost impacts of the rulemaking.

(68) *Comment:* The State Department of Land and Natural Resources, Land Division, requests that 15 tax map parcels be excluded from critical habitat because they: (1) Are currently being leased for activities that could be adversely affected by the designation (*e.g.*, agricultural leases); (2) have been identified as parcels with possible lease or development potential; (3) could suffer a significant loss in value; or (4) include water sources of water systems.

Our Response: As noted earlier, the Service modified the critical habitat designation for biological reasons, and as a result of the changes, five of the 15 parcels were no longer within the designation. The ten parcels remaining in the designation are located in Units A, G1, G3, H, I1, I2, I3, I4, K, and L. These ten parcels overlap with the designation in the amount of approximately 7,015 ac (2,839 ha). Approximately 90 percent (6,305 ac (2,552 ha)) is within the Conservation District. The other 10 percent (710 ac (287 ha)) is within the Agricultural District.

Chapter VI, Section 3.g. of the DEA and Section 4.e. of the Addendum discuss activities on Agricultural land and specifically recognize that some of the State managed Agricultural land is leased out to private entities as pasturage. DLNR-Land Division specifically identified three parcels within the proposed critical habitat designation that are leased for pasture purpose. Two of these parcels are no longer within the designation. The third parcel, approximately 710 ac (287 ha) in the Agricultural District, remains within the designation. No direct section 7 costs involving these leases are anticipated because there is no known Federal involvement.

Indirect costs, specifically the possibility of restrictions on the State's ability to lease the land caused by the interplay between critical habitat designation and State law, are discussed in Section 5.b. of the Addendum. As noted in Section 5.b., the likelihood of a future lawsuit interfering with existing agricultural activity within the designated critical habitat is considered low, based upon review of the existing Federal and State law provisions and professional judgment. However, for illustration purposes, an estimate of the potential impact is $7,100 per year utilizing the land rents of $10 per acre per year (as used in the DEA) since DLNR did not provide any additional information regarding the value of the affected leases.

Of the remaining ten parcels, DLNR did not identify which have possible lease or development potential, could suffer a significant loss in value, or include water sources for water systems. As noted above, the portions of these

parcels that overlap with the designation are all located within the Conservation District, where development is severely limited. Without more information from DLNR, it is difficult to evaluate how these parcels could suffer a significant loss in value as these parcels are already subject to the restrictions of the Conservation District. Finally, no costs are expected to occur from impacts to water systems, because none of the plants are stream-dependent for their survival and therefore would not cause a reduction in water diversion. In addition, water infrastructure is considered a manmade feature and therefore its operation and maintenance are not subject to critical habitat provisions of section 7, because these features and structures normally do not contain, and are not likely to develop, any primary constituent elements.

Summary of Changes From the Revised Proposed Rule

Based on a review of public comments received on the proposed determinations of critical habitat, we have reevaluated our proposed designations and included several changes to the final designations of critical habitat. These changes include the following:

(1) We published 139 critical habitat units for 60 plant species on the islands of Maui and Kahoolawe.

(2) The scientific names were changed for the following non-listed associated plant species found in the ''*Supplementary Information: Discussion of the Plant Taxa*'' section: *Thelypteris cyatheoides* changed to *Christella cyatheoides* (Palmer in press) in the discussions of *Cyanea glabra, Phlegmariurus mannii,* and *Pteris lydgatei; Lipochaeta lavarum* changed to *Melanthera lavarum* (Wagner and Robinson 2001) in the discussion of *Kanaloa kahoolawensis, Hedyotis coriacea, Hibiscus brackenridgei,* and *Spermolepis hawaiiensis; Styphelia tameiameiae* changed to *Leptecophylla tameiameiae* (Weiller 1999) in the discussion of *Asplenium fragile* var. *insulare, Bidens micrantha* ssp. *kalealaha, Diellia erecta, Lysimachia lydgatei, Melicope adscendens, Neraudia sericea, Phlegmariurus mannii, Plantago princeps, Platanthera holochila, Remyi mauiensis, Sanicula purpurea,* and *Schiedea haleakalensis; Lipochaeta integrifolia* changed to *Melanthera integrifolia* (Wagner and Robinson 2001) in the discussion of *Centaurium sebaeoides* and *Sesbania tomentosa; Pluchea symphytifolia* changed to *Pluchea carolinensis* (Wagner and Herbst 1995) in the discussions of *Cyrtandra munroi; Lycopodium cernuum* changed to *Lycopodiella cernua* (Palmer 2003) in the discussions of *Platanthera holochila; Morelotia gahniiformis* changed to *Gahnia gahniiformis* in the discussions of *Platanthera holochila;* and *Sphenomeris chusana* changed to *Sphenomeris chinensis* in the discussion of *Pteris lydgatei.*

(3) We replaced the specific name of the associated native plant species, *Hibiscus arnottianus* (which is not reported to occur on Maui), with ''*Hibiscus* spp.'' in the discussion of *Gouania vitifolia* in the ''*Supplementary Information: Discussion of the Plant Taxa*'' and section 17.96.

(4) We removed the following species from the ''*Supplementary Information: Discussion of the Plant Taxa,*'' as they are not reported to occur on Maui: *Chloris barbata* was removed from the list of associated native plant species for *Kanaloa kahoolawensis; Andropogon virginicus* was removed from the list of associated native plant species for *Melicope balloui;* and *Pennisetum setaceum* was removed from the list of associated native plant species for *Colubrina oppositifolia.*

(5) For clarity regarding the number of location occurrences for each species (which do not necessarily represent viable populations) and the number of populations essential for the conservation of a species (*e.g.*, 8 to 10 populations with 100, 300, or 500 reproducing individuals), we changed the word ''population'' to ''occurrence'' and updated the number of occurrences in the ''*Supplementary Information: Discussion of the Plant Taxa*'' section and in ''Table 2.—Summary of existing occurrences and land ownership for 70 species reported from Maui and Kahoolawe'' for the species listed below. In this final critical habitat rule, we have used ''occurrence'' when reporting collections or observations of one or more plants in a specific location. We have used ''population'' when discussing conservation goals for the Maui and Kahoolawe plants. We made the following changes for these species: *Alectryon macrococcus* changed from seven populations to 13 occurrences; *Argyroxiphium sandwicense* ssp. *macrocephalum* changed from four populations to seven occurrences; *Asplenium fragile* var. *insulare* changed from one population to two occurrences; *Bidens micrantha* ssp. *kalealaha* changed from three populations to four occurrences; *Bonamia menziesii* changed from four populations to six occurrences; *Cenchrus agrimonioides* changed from two populations to one occurrence; *Clermontia samuelii* changed from four populations to seven occurrences; *Colubrina oppositifolia* changed from two populations to one occurrence; *Ctenitis squamigera* changed from six populations to 12 occurrences; *Cyanea copelandii* ssp. *haleakalaensis* changed from three populations to five occurrences; *Cyanea hamatiflora* ssp. *hamatiflora* changed from seven populations to nine occurrences; *Cyanea lobata* changed from four populations to five occurrences; *Cyanea mceldowneyi* changed from six populations to 11 occurrences; *Cyrtandra munroi* changed from four populations to five occurrences; *Dubautia plantaginea* ssp. *humilis* changed from one population to two occurrences; *Flueggea neowawraea* changed from three populations to four occurrences; *Geranium arboreum* changed from seven populations to 12 occurrences; *Geranium multiflorum* changed from eight populations to 13 occurrences; *Hesperomannia arborescens* changed from two populations to four occurrences; *Hesperomannia arbuscula* changed from two populations to eight occurrences; *Mariscus pennatiformis* changed from one population to two occurrences; *Melicope adscendens* changed from two populations to 16 occurrences; *Melicope balloui* changed from two populations to three occurrences; *Melicope knudsenii* changed from one population to four occurrences; *Melicope ovalis* changed from one population to two occurrences; *Neraudia sericea* changed from three populations to five occurrences; *Plantago princeps* changed from five populations to eight occurrences; *Platanthera holochila* changed from three populations to five occurrences; *Remya mauiensis* changed from three populations to five occurrences; *Sanicula purpurea* changed from five populations to seven occurrences; *Sesbania tomentosa* changed from eight populations to six occurrences; *Spermolepis hawaiiensis* changed from four populations to five occurrences; *Tetramolopium capillare* changed from four populations to five occurrences; *Tetramolopium remyi* changed from zero populations to one occurrence; *Vigna o-wahuensis* changed from four populations to two occurrences; and *Zanthoxylum hawaiiense* changed from four populations to nine occurrences.

(6) We changed ''flowering cycles, pollination vectors, seed dispersal agents'' to ''reproduction cycles, dispersal agents'' in the life history portion of the ''*Supplementary Information: Discussion of the Plant*

Taxa'' section for the fern or fern ally species, *Asplenium fragile* var. *insulare, Ctenitis squamigera, Diellia erecta, Diplazium molokaiense, Phlegmariurus mannii,* and *Pteris lydgatei.*

(7) We revised the list of excluded, manmade features in the ''*Criteria Used to Identify Critical Habitat*'' and section 17.96 to include additional features based on information received during the public comment periods.

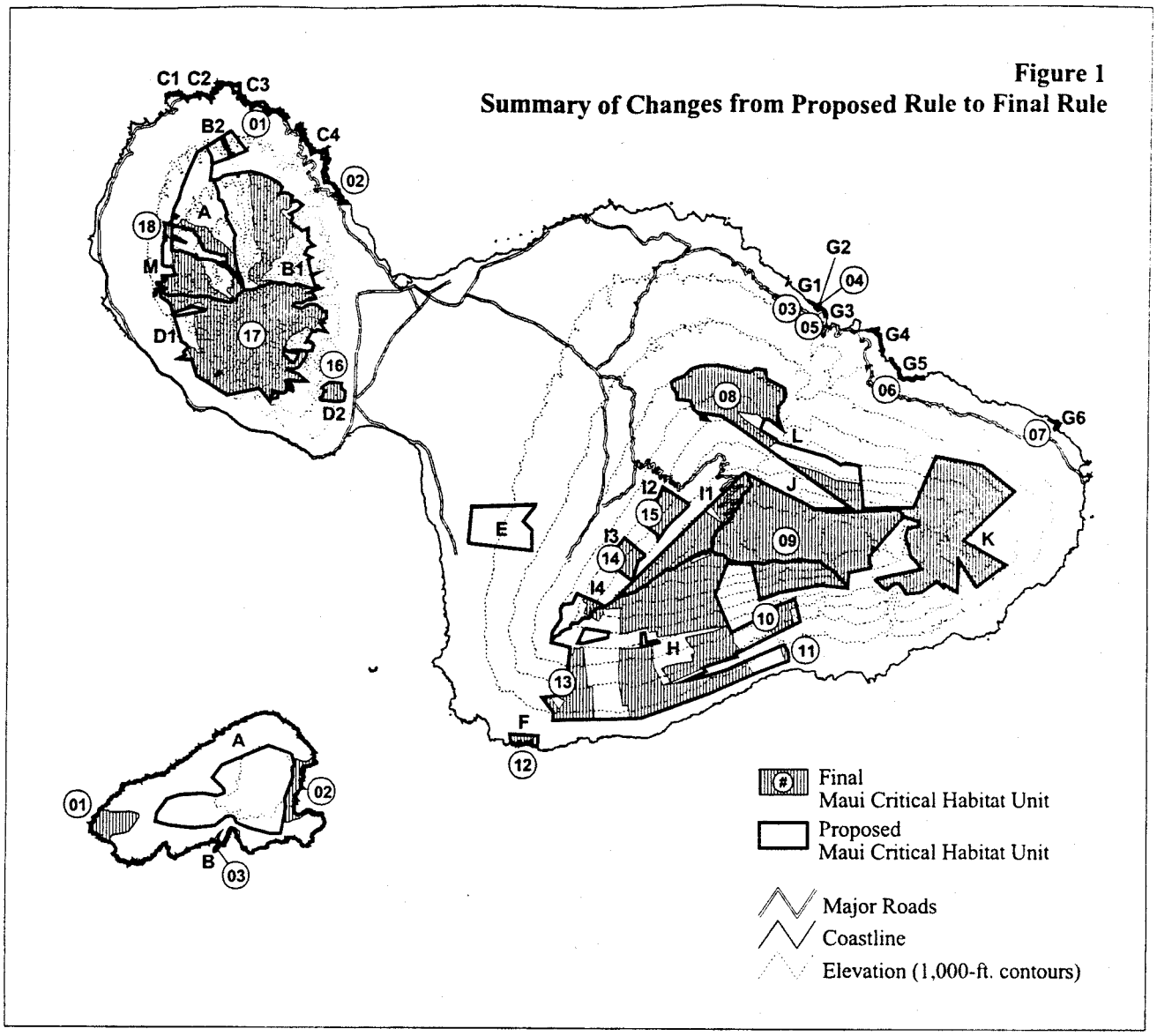
(8) We refined the elevation ranges for *Alectryon macrococcus, Argyroxiphium sandwicense* ssp. *macrocephalum, Asplenium fragile* var. *insulare, Bonamia menziesii, Brighamia rockii, Cenchrus agrimonioides, Centaurium sebaeoides, Clermontia lindseyana, Clermontia oblongifolia* ssp. *mauiensis, Clermontia samuelii, Colubrina oppositifolia, Ctenitis squamigera, Cyanea glabra, Cyanea lobata, Cyanea mceldowneyi, Cyrtandra munroi, Diellia erecta, Diplazium molokaiense, Dubautia plantaginea* ssp. *humilis, Flueggea neowawraea, Geranium arboreum, Geranium multiflorum, Gouania vitifolia, Hedyotis coriacea, Hesperomannia arbuscula, Hibiscus brackenridgei, Ischaemum byrone, Isodendrion pyrifolium, Kanaloa kahoolawensis, Mariscus pennatiformis, Melicope adscendens, Melicope balloui, Melicope knudsenii, Melicope mucronulata, Peucedanum sandwicense, Phlegmariurus mannii, Phyllostegia mannii, Phyllostegia mollis, Plantago princeps, Platanthera holochila, Pteris lidgatei, Remya mauiensis, Sanicula purpurea, Sesbania tomentosa, Tetramolopium capillare, Tetramolopium remyi,* and *Vigna o-wahuensis.*

(9) We corrected the typographic error in the acreage published for the revised proposed rule of critical habitat on Kahoolawe from 713 ha (1,762 ac) to 7,683 ha (18,984 ac).

(10) We made revisions to the unit boundaries based on information supplied by commenters, as well as information gained from field visits to some of the sites, that indicated that the primary constituent elements were not present in certain portions of the proposed unit, that certain changes in land use had occurred on lands within the proposed critical habitat that would preclude those areas from supporting the primary constituent elements, or that the areas were not essential to the conservation of the species in question. In addition, areas were excluded based on weighing the benefits of inclusion versus exclusion pursuant to section 4(b)(2) of the Act (*see* ''*Economic Analysis*'').

(11) In the draft rule, we proposed that TNCH's Kapunakea and Waikamoi Preserves and the State's upper Hanawi NAR not be included as critical habitat pursuant to section 3(5)(A) of the Act, because they are not in need of special management or protection. The reasons for this were discussed in detail in the proposed rule. In this final rule we have determined that they should also be excluded under section 4(b)(2) of the Act, because we have determined that the benefits of exclusion exceed the benefits of inclusion due to the positive and voluntary conservation efforts underway there (*see* discussion under Analysis of Impacts Under Section 4(b)(2)).

A brief summary of the modifications made to each unit is given below (*see also* Figure 1).



Maui A

This unit was proposed as critical habitat for 16 species: *Alectryon macrococcus; Clermontia oblongifolia* ssp. *mauiensis; Colubrina oppositifolia; Ctenitis squamigera; Cyanea glabra; Cyanea lobata; Cyrtandra munroi; Gouania vitifolia; Hedyotis mannii; Hesperomannia arbuscula; Phlegmariurus mannii; Platanthera holochila; Plantago princeps; Pteris lydgatei; Remya mauiensis;* and *Sanicula purpurea.* We excluded the proposed critical habitat on ML&P lands because the benefits of excluding them outweighed the benefits of inclusion (*see ''Analysis of Impacts Under Section 4(b)(2): Other Impacts''*). Proposed critical habitat in Maui A for *Colubrina oppositifolia, Plantago princeps,* and *Pteris lydgatei,* all multi-island species, was excluded. This area is not essential to the conservation of these three species because it has a lower proportion of associated native species and more nonnative species than other areas we consider to be essential to the conservation of these three species. In addition, there are at least eight other locations for each of these species within their historical ranges on Maui and other islands which provide habitat essential for their conservation and which are either designated as critical habitat in this final rule or have been designated or proposed for designation in other rules.

The area designated as critical habitat for the Maui endemic species, *Remya mauiensis,* provides habitat within its historical range for two populations. The area designated as critical habitat for the following multi-island species provides habitat for two populations of *Alectryon macrococcus;* three populations each of *Clermontia oblongifolia* ssp. *mauiensis, Ctenitis squamigera,* and *Cyanea glabra;* two populations of *Cyanea lobata;* four populations of *Cyrtandra munroi;* one population of *Gouania vitifolia;* two populations each of *Hedyotis mannii* and *Hesperomannia arbuscula;* one population each of *Phlegmariurus mannii* and *Platanthera holochila;* and three populations of *Sanicula purpurea* within their historical ranges.

These modifications resulted in the reduction from 3,884 ha (9,598 ac) to 1,632 ha (4,033 ac). This unit was renamed Maui 17—*Alectryon macrococcus*—d, 17—*Alectryon macrococcus*—e, 17—*Clermontia oblongifolia* ssp. *mauiensis*—a, 17—*Clermontia oblongifolia* ssp.

mauiensis—c, 17—*Ctenitis squamigera*—b, 17—*Ctenitis squamigera*—c, 17—*Cyanea glabra*—e, 17—*Cyanea glabra*—f, 17—*Cyanea lobata*—a, 17—*Cyrtandra munroi*—a, 17—*Cyrtandra munroi*—b, 17—*Gouania vitifolia*—a, 17—*Hedyotis mannii*—a, 17—*Hesperomannia arbuscula*—a, 17—*Phlegmariurus mannii*—d, 17—*Platanthera holochila*—c, 17—*Remya mauiensis*—b, 17—*Remya mauiensis*—c, 17—*Sanicula purpurea*—b, 18—*Alectryon macrococcus*—f, 18—*Ctenitis squamigera*—d, and 18—*Remya mauiensis*—d.

Maui B

This unit was proposed as critical habitat for 11 species: *Clermontia oblongifolia* ssp. *mauiensis; Ctenitis squamigera; Cyanea lobata; Cyrtandra munroi; Diplazium molokaiense; Hesperomannia arborescens; Phlegmariurus mannii; Platanthera holochila; Plantago princeps; Pteris lydgatei;* and *Sanicula purpurea.* We excluded the proposed critical habitat on ML&P lands because the benefits of excluding them outweighed the benefits of inclusion (*see ''Analysis of Impacts Under Section 4(b)(2): Other Impacts''*). As a result, no critical habitat was designated for *Hesperomannia arborescens,* a multi-island species, on Maui because all of the habitat proposed for this species is within these lands. However, we have proposed (67 FR 37108) and designated (68 FR 12981) critical habitat on other islands within its historical range. We excluded the proposed critical habitat for the multi-island species *Ctenitis squamigera* and *Platanthera holochila* in Maui B. Areas proposed for these two species were excluded because they are not essential to the conservation of these two species. We are designating adequate and more appropriate habitat elsewhere on Maui for these two species in this final rule and have designated or proposed for designation habitat on other islands within their historical ranges. There is a lower likelihood that the biological features essential to these species will persist there because these areas have a low likelihood of being managed by the landowner for conservation. In addition, there are at least eight other locations for each of these species within their historical ranges on Maui and other islands.

The area designated as critical habitat for the multi-island species provides habitat within historical range for six populations of *Clermontia oblongifolia* ssp. *mauiensis;* three populations each of *Cyanea lobata, Cyrtandra munroi,* and *Diplazium molokaiense;* one population each of *Phlegmariurus mannii* and *Plantago princeps;* two populations of *Pteris lidgatei;* and four populations of *Sanicula purpurea.*

These modifications resulted in the reduction from 4,736 ha (11,701 ac) to 1,760 ha (4,349 ac). This unit was renamed 17—*Clermontia oblongifolia* ssp. *mauiensis*—b, 17—*Clermontia oblongifolia* ssp. *mauiensis*—c, 17—*Cyanea lobata*—c, 17—*Cyrtandra munroi*—c, 17—*Diplazium molokaiense*—c, 17—*Phlegmariurus mannii*—d, 17—*Plantago princeps*—b, 17—*Pteris lidgatei*—a, 17—*Sanicula purpurea*—a, 17—*Sanicula purpurea*—b, and 17—*Sanicula purpurea*—c.

Maui C

This unit was proposed as critical habitat for three species: *Brighamia rockii; Centaurium sebaeoides;* and *Sesbania tomentosa.* Modifications were made to this unit to exclude areas that do not contain the primary constituent elements for these species.

The area designated as critical habitat for these multi-island species provides habitat within their historical ranges for two populations of *Brighamia rockii* and one population each of *Centaurium sebaeoides* and *Sesbania tomentosa.*

These modifications resulted in the reduction from 356 ha (880 ac) to 110 ha (270 ac). This unit was renamed 2—*Brighamia rockii*—a, 2—*Brighamia rockii*—b, 2—*Centaurium sebaeoides*—b, and 1—*Sesbania tomentosa*—a.

Maui D

This unit was proposed as critical habitat for 28 species: *Cenchrus agrimonioides; Clermontia oblongifolia* ssp. *mauiensis; Ctenitis squamigera; Cyanea glabra; Cyanea grimesiana* ssp. *grimesiana; Cyanea lobata; Cyrtandra munroi; Diellia erecta; Diplazium molokaiense; Dubautia plantaginea* ssp. *humilis; Gouania vitifolia; Hedyotis coriacea; Hedyotis mannii; Hesperomannia arbuscula; Hibiscus brackenridgei; Isodendrion pyrifolium; Lysimachia lydgatei; Neraudia sericea; Peucedanum sandwicense; Phlegmariurus mannii; Plantago princeps; Platanthera holochila; Pteris lydgatei; Remya mauiensis; Sanicula purpurea; Spermolepis hawaiiensis; Tetramolopium capillare;* and *Tetramolopium remyi.* We excluded the proposed critical habitat in Maui D for *Clermontia oblongifolia* ssp. *mauiensis, Cyrtandra munroi, Isodendrion pyrifolium, Neraudia sericea, Tetramolopium capillare,* and *Tetramolopium remyi.* Areas proposed for these six species were excluded because they are not essential to the conservation of these species. There is a lower likelihood that the biological features essential to these species will persist there because they have a lower proportion of associated native species than other areas we consider to be essential to the conservation of these six species and they have a low likelihood of being managed for conservation. In addition, there are at least eight other locations for each of these species designated elsewhere on Maui and proposed or designated on other islands within their historical ranges.

The area designated as critical habitat for the Maui endemic species provides habitat for six populations of *Dubautia plantaginea* ssp. *humilis* and four populations of *Remya mauiensis* within their historical ranges. The area designated as critical habitat for the multi-island species provides habitat for one population of *Cenchrus agrimonioides;* two populations of *Ctenitis squamigera;* four populations of *Cyanea glabra;* two populations each of *Cyanea grimesiana* ssp. *grimesiana, Cyanea lobata,* and *Diellia erecta;* three populations of *Diplazium molokaiense;* one population of *Gouania vitifolia;* two populations each of *Hedyotis coriacea* and *Hedyotis mannii;* five populations of *Hesperomannia arbuscula;* three populations of *Hibiscus brackenridgei;* eight populations of *Lysimachia lydgatei;* one population each of *Peucedanum sandwicense, Phlegmariurus mannii, Plantago princeps, Platanthera holochila,* and *Pteris lidgatei;* three populations of *Sanicula purpurea;* and one population of *Spermolepis hawaiiensis* within their historical ranges.

These modifications resulted in the reduction from 7,162 ha (17,698 ac) to 6,358 ha (15,709 ac). This unit was renamed 17—*Cenchrus agrimonioides*—b, 17—*Ctenitis squamigera*—a, 17—*Cyanea glabra*—d, 17—*Cyanea glabra*—e, 17—*Cyanea glabra*—g, 17—*Cyanea grimesiana* ssp. *grimesiana*—a, 17—*Cyanea lobata*—b, 17—*Diellia erecta*—c, 17—*Diellia erecta*—d, 17—*Diellia erecta*—e, 17—*Diellia erecta*—f, 17—*Diplazium molokaiense*—c, 17—*Dubautia plantaginea* ssp. *humilis*—a, 17—*Dubautia plantaginea* ssp. *humilis*—b, 17—*Dubautia plantaginea* ssp. *humilis*—c, 17—*Gouania vitifolia*—a, 17—*Hedyotis coriacea*—a, 17—*Hedyotis coriacea*—b, 17—*Hedyotis mannii*—a, 17—*Hesperomannia arbuscula*—a, 17—*Hesperomannia arbuscula*—b, 17—*Hibiscus brackenridgei*—b, 17—*Lysimachia lydgatei*—a, 17—*Lysimachia lydgatei*—b, 17—*Lysimachia lydgatei*—c, 17—*Lysimachia lydgatei*—d, 17—*Lysimachia lydgatei*—e, 17—*Peucedanum sandwicense*—b, 17—*Phlegmariurus mannii*—e, 17—*Plantago*

princeps—b, 17—*Platanthera holochila*—b, 17—*Pteris lidgatei*—b, 17—*Remya mauiensis*—a, 17—*Remya mauiensis*—b, 17—*Sanicula purpurea*—b, 17—*Spermolepis hawaiiensis*—b, and 16—*Hibiscus brackenridgei*—a.

Maui E

This unit was proposed as critical habitat for two multi-island species, *Bonamia menziesii* and *Hibiscus brackenridgei.* The entire unit is eliminated from the final rule. There is a lower likelihood that the biological features essential to these species will persist there because the area has a low likelihood of being managed for conservation and there are 10 other locations that have been designated or proposed to meet the recovery goal of 8 to 10 populations throughout their historical ranges on this and other islands. There is also habitat designated elsewhere on Maui for *Bonamia menziesii* and *Hibiscus brackenridgei.* Exclusion of this unit from critical habitat for *Bonamia menziesii* and *Hibiscus brackenridgei* resulted in the overall reduction of 14,101 ha (34,843 ac) of critical habitat on Maui.

Maui F

No changes were made to Maui F. The area designated as critical habitat for the multi-island species *Vigna o-wahuensis* provides habitat within its historical range for one population. This unit remains 144 ha (357 ac) but was renamed 12—*Vigna o-wahuensis*—a.

Maui G

This unit was proposed as critical habitat for four species: *Brighamia rockii; Ischaemum byrone; Mariscus pennatiformis;* and *Peucedanum sandwicense.* Modifications were made to this unit to exclude areas that do not contain the primary constituent elements for these species. The portion excluded was not essential to the conservation of these four species because it has a lower proportion of associated native species than other areas we consider to be essential to the conservation of these four species, it has a low likelihood of being managed for conservation (Buck, *in litt.* 2002), and there are at least eight other locations that have been designated or proposed to meet the recovery goal of 8 to 10 populations throughout their historical ranges on this and other islands.

The area designated as critical habitat for these multi-island species provides habitat for one population of *Brighamia rockii,* two populations each of *Ischaemum byrone* and *Mariscus pennatiformis,* and one population of *Peucedanum sandwicense* within their historical ranges.

These modifications resulted in the reduction from 83 ha (185 ac) to 52 ha (128 ac). This unit was renamed 3—*Brighamia rockii*—c, 4—*Brighamia rockii*—d, 5—*Brighamia rockii*—e, 5—*Ischaemum byrone*—a, 7—*Ischaemum byrone—b, 5— Mariscus pennatiformis*—a, and 4—*Peucedanum sandwicense*—a.

Maui H

This unit was proposed as critical habitat for 25 species: *Alectryon macrococcus; Argyroxiphium sandwicense* ssp. *macrocephalum; Bidens micrantha* ssp. *kalealaha; Bonamia menziesii; Cenchrus agrimonioides; Clermontia lindseyana; Colubrina oppositifolia; Diellia erecta; Diplazium molokaiense; Flueggea neowawraea; Geranium arboreum; Geranium multiflorum; Lipochaeta kamolensis; Melicope adscendens; Melicope knudsenii; Melicope mucronulata; Neraudia sericea; Nototrichium humile; Phlegmariurus mannii; Phyllostegia mollis; Plantago princeps; Sesbania tomentosa; Schiedea haleakalensis; Spermolepis hawaiiensis;* and *Zanthoxylum hawaiiense.* We excluded the proposed critical habitat on Ulupalakua and Haleakala Ranch lands because the benefits of excluding these lands outweighed the benefits of including them in critical habitat (see ''*Analysis of Impacts Under Section 4(b)(2)*''). We excluded the proposed critical habitat for the Maui endemics *Geranium arboreum* and *Schiedea haleakalensis,* and the multi-island species *Zanthoxylum hawaiiense.* Areas proposed for these three species were excluded because we have proposed adequate and more appropriate habitat elsewhere on Maui and, for *Z. hawaiiense,* on other islands within its historical ranges. The portion excluded was not essential to the conservation of these three species because it has a lower proportion of associated native species than other areas we consider to be essential to the conservation of these three species, it has a low likelihood of being managed for conservation (Urdman *in litt.,* 2002; Silva *in litt.,* 2002), and there are at least eight other locations that have been designated or proposed to meet the recovery goal of 8 to 10 populations throughout their historical ranges on this and other islands. There is habitat designated elsewhere on Maui for *Geranium arboreum, Schiedea haleakalensis,* and *Zanthoxylum hawaiiense.*

The area designated as critical habitat for the Maui endemic species provides habitat for one population each of *Argyroxiphium sandwicense* ssp. *macrocephalum* and *Geranium multiflorum,* four populations of *Lipochaeta kamolensis,* and one population of *Melicope adscendens* within their historical ranges. The area designated as critical habitat for the multi-island species provides habitat for two populations of *Alectryon macrococcus;* four populations of *Bidens micrantha* ssp. *kalealaha;* one population each of *Bonamia menziesii* and *Cenchrus agrimonioides;* two populations of *Clermontia lindseyana;* one population each of *Colubrina oppositifolia, Diellia erecta, Diplazium molokaiense,* and *Flueggea neowawraea;* two populations each of *Melicope knudsenii* and *Melicope mucronulata;* three populations of *Neraudia sericea;* two populations of *Nototrichium humile;* one population of *Phlegmariurus mannii;* two populations of *Phyllostegia mollis;* and one population each of *Plantago princeps, Sesbania tomentosa,* and *Spermolepis hawaiiensis* within their historical ranges.

These modifications resulted in the reduction from 14,101 ha (34,843 ac) to 9,823 ha (24,270 ac). This unit was renamed 9—*Argyroxiphium sandwicense* ssp. *macrocephalum*—a, 9—*Bidens micrantha* ssp. *kalealaha*—b, 9—*Clermontia lindseyana*—a, 9—*Clermontia lindseyana*—b, 9—*Diellia erecta*—b, 9—*Diplazium molokaiense*—b, 9—*Flueggea neowawraea*—a, 9—*Geranium multiflorum*—c, 9—*Lipochaeta kamolensis*—a, 9—*Melicope knudsenii*—a, 9—*Melicope mucronulata*—a, 9—*Neraudia sericea*—a, 9—*Nototrichium humile*—a, 9—*Phlegmariurus mannii*—b, 9—*Phyllostegia mollis*—b, 9—*Plantago princeps*—a, 10—*Alectryon macrococcus*—b, 11—*Lipochaeta kamolensis*—b, 13—*Alectryon macrococcus*—c, 13—*Bonamia menziesii*—a, 13—*Cenchrus agrimonioides*—a, 13—*Colubrina oppositifolia*—a, 13—*Flueggea neowawraea*—b, 13—*Melicope adscendens*—a, 13—*Melicope knudsenii*—b, 13—*Melicope mucronulata*—b, 13—*Sesbania tomentosa*—b, and 13—*Spermolepis hawaiiensis*—a.

Maui I

This unit was proposed as critical habitat for 11 species: *Argyroxiphium sandwicense* ssp. *macrocephalum; Asplenium fragile* var. *insulare; Bidens micrantha* ssp. *kalealaha; Clermontia lindseyana; Diellia erecta; Diplazium molokaiense; Geranium arboreum; Geranium multiflorum; Phlegmariurus mannii; Phyllostegia mollis;* and

Plantago princeps. We excluded the proposed critical habitat on Haleakala Ranch lands because the benefits of excluding these lands outweighed the benefits of including them in critical habitat (see 4(b)(2) exclusion section). We excluded the proposed critical habitat for the Maui endemic *Geranium arboreum* and the multi-island species *Diplazium molokaiense, Phlegmariurus mannii, Phyllostegia mollis,* and *Plantago princeps.* The portion excluded was not essential to the conservation of these five species because it has a lower proportion of associated native species than other areas we consider to be essential to the conservation of these five species. There is a lower likelihood that the biological features essential to these species will persist there because it has a low likelihood of being managed for conservation (Silva *in litt.,* 2002). There is habitat designated elsewhere on Maui for *Diplazium molokaiense, Geranium arboreum, Phlegmariurus mannii, Phyllostegia mollis,* and *Plantago princeps.*

The area designated as critical habitat for the Maui endemic species provides habitat for one population of *Argyroxiphium sandwicense* ssp. *macrocephalum,* three populations of *Geranium arboreum,* and six populations of *Geranium multiflorum* within their historical ranges. The area designated as critical habitat for the multi-island species provides habitat for two populations of *Asplenium fragile* var. *insulare,* four populations of *Bidens micrantha* ssp. *kalealaha,* and one population each of *Clermontia lindseyana* and *Diellia erecta* within their historical ranges.

These modifications resulted in the reduction from 3,491 ha (8,625 ac) to 2,961 ha (7,383 ac). This unit was renamed 9—*Argyroxiphium sandwicense* ssp. *macrocephalum*—a, 9—*Asplenium fragile* var. *insulare*—a, 9—*Bidens micrantha* ssp. *kalealaha*—b, 9—*Clermontia lindseyana*—b, 9—*Diellia erecta*—a, 9—*Geranium multiflorum*—b, 14—*Geranium arboreum*—b, and 15—*Geranium arboreum*—c.

Maui J

This unit was proposed as critical habitat for eight species: *Argyroxiphium sandwicense* ssp. *macrocephalum; Asplenium fragile* var. *insulare; Bidens micrantha* ssp. *kalealaha; Clermontia samuelii; Geranium multiflorum; Plantago princeps; Platanthera holochila;* and *Schiedea haleakalensis.* We excluded the proposed critical habitat for *Argyroxiphium sandwicense* ssp. *macrocephalum, Geranium multiflorum,* and *Platanthera holochila* in Maui J. This area is not essential to the conservation of these three species because it has a lower proportion of associated native species than other areas we consider to be essential to the conservation of these three species. For the Maui endemic *Argyroxiphium sandwicense* ssp. *macrocephalum,* the recovery goal is one population with more than 50,000 individuals. We are designating habitat essential for the conservation of this species in Maui unit 9. There are at least eight other locations on Maui which provide habitat for the endemic species *Geranium multiflorum* that are being designated as critical habitat. There are at least eight other locations in its historical range on Maui and other islands that provide habitat for the multi-island species *Platanthera holochila* that are being designated as critical habitat, have been designated as critical habitat, or have been proposed for designation.

The area designated as critical habitat for the Maui endemic species *Schiedea haleakalensis* provides habitat within its historical range for four populations. The area designated as critical habitat for the multi-island species provides habitat for two populations of *Asplenium fragile* var. *insulare,* three populations of *Bidens micrantha* ssp. *kalealaha,* five populations of *Clermontia samuelii,* and one population of *Plantago princeps* within their historical ranges.

These modifications resulted in the reduction from 5,790 ha (14,308 ac) to 5,785 ha (14,295 ac). This unit was renamed 9—*Asplenium fragile* var. *insulare*—a, 9—*Bidens micrantha* ssp. *kalealaha*—a, 9—*Clermontia samuelii*—a, 9—*Plantago princeps*—a, 9—*Schiedea haleakalensis*—a, and 9—*Schiedea haleakalensis*—b.

Maui K

This unit was proposed as critical habitat for 11 species: *Alectryon macrococcus; Clermontia samuelii; Cyanea copelandii* ssp. *haleakalaensis; Cyanea glabra; Cyanea hamatiflora* ssp. *hamatiflora; Geranium multiflorum; Melicope balloui; Melicope ovalis; Phlegmariurus mannii; Plantago princeps;* and *Platanthera holochila.* We excluded the proposed critical habitat for *Alectryon macrococcus, Clermontia samuelii, Cyanea copelandii* ssp. *haleakalaensis, Cyanea hamatiflora* ssp. *hamatiflora,* and *Plantago princeps.* This area is not essential to the conservation of these five species because it has a lower proportion of associated native species than other areas we consider to be essential to the conservation of these five species, and there are at least eight other locations that have been designated or proposed to meet the recovery goal of 8 to 10 populations throughout their historical ranges on this and other islands.

The area designated as critical habitat for the Maui endemic species provides habitat for six populations of *Geranium multiflorum,* two populations of *Melicope balloui,* and three populations of *Melicope ovalis* within their historical ranges. The area designated as critical habitat for the multi-island species provides habitat for five populations of *Clermontia samuelii,* three populations each of *Cyanea glabra* and *Phlegmariurus mannii,* and one population of *Platanthera holochila* within their historical ranges.

These modifications resulted in the reduction from 5,464 ha (13,502 ac) to 5,458 ha (13,487 ac). This unit was renamed 9—*Clermontia samuelii*—a, 9—*Cyanea glabra*—b, 9—*Cyanea glabra*—c, 9—*Geranium multiflorum*—b, 9—*Melicope balloui*—b, 9—*Melicope ovalis*—a, 9—*Phlegmariurus mannii*—c, and 9—*Platanthera holochila*—a.

Maui L

This unit was proposed as critical habitat for 16 species: *Alectryon macrococcus; Argyroxiphium sandwicense* ssp. *macrocephalum; Asplenium fragile* var. *insulare; Clermontia samuelii; Cyanea copelandii* ssp. *haleakalaensis; Cyanea glabra; Cyanea hamatiflora* ssp. *hamatiflora; Cyanea mceldowneyi; Diplazium molokaiense; Geranium multiflorum; Melicope balloui; Phlegmariurus mannii; Phyllostegia mannii; Phyllostegia mollis; Platanthera holochila;* and *Zanthoxylum hawaiiense.* We excluded the proposed critical habitat for the Maui endemic *Cyanea mceldowneyi,* and the multi-island species *Alectryon macrococcus* and *Asplenium fragile* var. *insulare.* The portion excluded has a lower likelihood that the biological features essential to these species will persist because it has a low likelihood of being managed for conservation. In addition, there are at least eight other locations that have been designated or proposed to meet the recovery goal of 8 to 10 populations throughout their historical ranges on this and other islands.

The area designated as critical habitat for the Maui endemic species provides habitat for one population of *Argyroxiphium sandwicense* ssp. *macrocephalum,* three populations of *Cyanea copelandii* ssp. *haleakalaensis* and *Cyanea hamatiflora* ssp. *hamatiflora,* seven populations of *Geranium multiflorum,* and one

population of *Melicope balloui* within their historical ranges. The area designated as critical habitat for the multi-island species provides habitat for five populations of *Clermontia samuelii;* two populations each of *Cyanea glabra, Diplazium molokaiense, Phlegmariurus mannii,* and *Phyllostegia mannii;* and one population each of *Phyllostegia mollis, Platanthera holochila,* and *Zanthoxylum hawaiiense* within their historical ranges.

These modifications resulted in the reduction from 4,612 ha (11,396 ac) to 3,608 ha (8,916 ac). This unit was renamed 8—*Cyanea copelandii* ssp. *haleakalaensis*—a, 8—*Cyanea glabra*—a, 8—*Cyanea hamatiflora* ssp. *hamatiflora*—a, 8—*Diplazium molokaiense*—a, 8—*Geranium multiflorum*—a, 8—*Melicope balloui*—a, 8—*Phlegmariurus mannii*—a, 8—*Phyllostegia mannii*—a, 8—*Phyllostegia mollis*—a, 8—*Zanthoxylum hawaiiense*—a, 9—*Argyroxiphium sandwicense* ssp. *macrocephalum*—a, 9—*Clermontia samuelii*—a, 9—*Geranium multiflorum*—b, and 9—*Platanthera holochila*—a.

Maui M

This unit was proposed as critical habitat for *Spermolepis hawaiiense.* The entire area proposed for this species is eliminated from this final rule. There is a lower likelihood that the biological features essential to these species will persist there because it has a low likelihood of being managed for conservation (Buck, *in litt.* 2002) and it has a lower proportion of associated native species than other areas we consider to be essential to the conservation of this species. In addition, there are 10 other locations that have been designated or proposed to meet the recovery goal of 8 to 10 populations throughout their historical ranges on this and other islands. There is habitat designated elsewhere on Maui for *Spermolepis hawaiiense.*

Kahoolawe A

This unit was proposed as critical habitat for four species: *Hibiscus brackenridgei; Kanaloa kahoolawensis; Sesbania tomentosa;* and *Vigna o-wahuensis.* We excluded the proposed critical habitat for *Hibiscus brackenridgei, Sesbania tomentosa,* and *Vigna o-wahuensis.* There is a lower likelhood that the biological features essential to these species will persist there because it has a low likelihood of being managed for conservation (KIRC, *in litt.* 2002) and it has a lower proportion of associated native species than other areas we consider to be essential to the conservation of this species. In addition, there are 10 other locations that have been designated or proposed to meet the recovery goal of 8 to 10 populations throughout their historical ranges on this and other islands. Modifications were also made to this unit to exclude areas that do not contain the primary constituent elements for *Kanaloa kahoolawensis.*

The area designated as critical habitat for the multi-island species *Kanaloa kahoolawensis* provides habitat within its historical range for seven populations.

These modifications resulted in the reduction from 7,683 ha (18,984 ac) to 1,175 ha (2,903 ac). This unit was renamed Kahoolawe 1—*Kanaloa kahoolawensis*—a and Kahoolawe 2—*Kanaloa kahoolawensis*—b.

Kahoolawe B

This unit was proposed as critical habitat for two species: *Kanaloa kahoolawensis* and S*esbania tomentosa.* We excluded the proposed critical habitat for the multi-island species *Sesbania tomentosa.* There is a lower likelihood that the biological features essential to this species will persist there because it has a low likelihood of being managed for conservation (KIRC, *in litt.* 2002) and there are10 other locations that have been designated to meet the recovery goal of 8 to 10 populations throughout its historical range on this and other islands.

The area designated as critical habitat for the multi-island species *Kanaloa kahoolawensis* provides habitat within its historical range for one population.

There was no change in the area proposed in the final designation. It remains at 5 ha (12 ac). This unit was renamed Kahoolawe 3—*Kanaloa kahoolawensis*—c.

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,'' as defined by the Act, 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 ''* * * a 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.'' However, in the March 15, 2001, decision of the United States Court of Appeals for the Fifth Circuit (*Sierra Club* v. *U.S. Fish and Wildlife Service et al.*, 245 F.3d 434) regarding a not prudent finding, the Court found our definition of destruction or adverse modification as currently contained in 50 CFR 402.02 to be invalid. In response to this decision, we are reviewing the regulatory definition of adverse modification in relation to the conservation of the species.

In order to be included in a critical habitat designation, areas within the geographical range of the species at the time of listing must contain the physical or biological features essential to the conservation of the species or, for an area outside the geographical area occupied by the species at the time of listing, the area itself must be essential to the conservation of the species (16 U.S.C. 1532(5)(A)).

Section 4 of the Act requires that we designate critical habitat for a species, to the extent such habitat is determinable, at the time of listing. When we designate critical habitat at the time of listing or under short court-ordered deadlines, we may not have sufficient information to identify all the areas essential for the conservation of the species, we may inadvertently include areas that later will be shown to be nonessential. Nevertheless, we are required to designate those areas we know to be critical habitat, using the best information available to us.

Within the geographic areas occupied by the species, we will designate only areas that have features and habitat characteristics that are necessary to sustain the species. 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.

Our regulations state that ''The Secretary shall designate as critical habitat areas outside the geographical area presently occupied by a 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.

Our Policy on Information Standards Under the Endangered Species Act, published in the **Federal Register** on July 1, 1994 (59 FR 34271), provides criteria, establishes procedures, and provides guidance to ensure that our decisions represent the best scientific and commercial data available. It requires our 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 recovery plans, articles in peer-reviewed journals, conservation plans developed by States and counties, scientific status surveys and studies, and biological assessments or other unpublished materials.

It is important to clearly 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 Act's 7(a)(2) jeopardy standard and section 9 prohibitions, 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. 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.

Prudency

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

To determine whether critical habitat would be prudent for each species, we analyzed the potential threats and benefits for each species in accordance with the court's order. In the final critical habitat rule published for Kauai and Niihau plants, we determined that designation of critical habitat was not prudent for *Acaena exigua,* a species reported from Maui as well as from Kauai because it had not been seen recently in the wild, and no genetic material of this species was known to exist (68 FR 9115). In other final rules, we have found that critical habitat would be prudent for the following 45 species that are reported from Maui and Kahoolawe as well as from Lanai, Kauai, Niihau, and Molokai: *Adenophorus periens; Alectryon macrococcus; Bidens micrantha* ssp. *kalealaha; Bonamia menziesii; Brighamia rockii; Cenchrus agrimonioides; Centaurium sebaeoides; Clermontia oblongifolia* ssp. *mauiensis; Clermontia samuelii; Ctenitis squamigera; Cyanea copelandii* ssp. *haleakalaensis; Cyanea glabra; Cyanea grimesiana* ssp. *grimesiana; Cyanea hamatiflora* ssp. *hamatiflora; Cyanea lobata; Cyrtandra munroi; Delissea undulata; Diellia erecta; Diplazium molokaiense; Flueggea neowawraea; Hedyotis mannii; Hesperomannia arborescens; Hibiscus brackenridgei; Ischaemum byrone; Isodendrion pyrifolium; Kanaloa kahoolawensis; Mariscus pennatiformis; Melicope knudsenii; Melicope mucronulata; Neraudia sericea; Peucedanum sandwicense; Phlegmariurus mannii; Phyllostegia mannii; Phyllostegia mollis; Phyllostegia parvilfora; Plantago princeps; Platanthera holochila; Pteris lidgatei; Schiedea nuttallii; Sesbania tomentosa; Solanum incompletum; Spermolepis hawaiiensis; Tetramolopium remyi; Vigna o-wahuensis;* and *Zanthoxylum hawaiiense* (64 FR 48307, 68 FR 1219, 68 FR 9115, 68 FR 12981).

Due to low numbers of individuals and/or populations and their inherent immobility, the other 24 plants may be vulnerable to unrestricted collection, vandalism, or disturbance. However, we examined the evidence available for these taxa and have not, at this time, found specific evidence of taking, vandalism, collection or trade of these taxa or of similar species. Consequently, while we remain concerned that these activities could potentially threaten these 24 plant species in the future, consistent with applicable regulations (50 CFR 424.12(a)(1)(i)) and the court's discussion of these regulations, we do not find that any of these species are currently threatened by taking or other human activity, which would be exacerbated by the designation of critical habitat.

In the absence of finding that critical habitat would increase threats to a species, if there are any benefits to critical habitat designation, then a prudent finding is warranted. The potential benefits include: (1) Triggering section 7 consultation in new areas where it would not otherwise occur; (2) focusing conservation activities on the most essential area; (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 24 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. Thirteen of these species are reported on or near Federal lands (see Table 2 above, under ''Discussion of Plant Taxa''), where actions are subject to section 7 consultation. Although a majority of the species considered in this rule are located exclusively on non-Federal lands with limited Federal activities, there could be Federal actions affecting these lands in the future. While a critical habitat designation for habitat currently occupied by these species would not likely change the section 7 consultation outcome, since an action that destroys or adversely modifies such critical habitat would also be likely to result in jeopardy to the species, there may be instances where section 7 consultation would be triggered only if critical habitat were designated. There would also be some educational or informational benefits to the designation of critical habitat. Benefits of designation would include the notification of land owners, land managers, and the general public of the importance of protecting the habitat of

these species and dissemination of information regarding their essential habitat requirements.

Therefore, we believe that the designation of critical habitat is prudent for these 24 plant species: *Argyroxiphium sandwicense* ssp. *macrocephalum; Asplenium fragile* var. *insulare; Clermontia lindseyana; Clermontia peleana; Colubrina oppositifolia; Cyanea mceldowneyi; Dubautia plantaginea* ssp. *humilis; Geranium arboreum; Geranium multiflorum; Gouania vitifolia; Hedyotis coriacea; Hesperomannia arbuscula; Lipochaeta kamolensis; Lysimachia lydgatei; Melicope adscendens; Melicope balloui; Melicope ovalis; Nototrichium humile; Remya mauiensis; Sanicula purpurea; Schiedea haleakalensis; Schiedea hookeri; Tetramolopium arenarium;* and *Tetramolopium capillare* because the potential benefits of critical habitat designation outweigh the potential threats.

Methods

As required by the Act and regulations (section 4(b)(2) and 50 CFR 424.12), we used the best scientific information available to determine areas that contain the physical and biological features that are essential for the conservation of *Adenophorus periens, Alectryon macrococcus, Argyroxiphium sandwicense* ssp. *macrocephalum, Asplenium fragile* var. *insulare, Bidens micrantha* ssp. *kalealaha, Bonamia menziesii, Brighamia rockii, Cenchrus agrimonioides, Centaurium sebaeoides, Clermontia lindseyana, Clermontia oblongifolia* ssp. *mauiensis, Clermontia samuelii, Clermontia peleana, Colubrina oppositifolia, Ctenitis squamigera, Cyanea copelandii* ssp. *haleakalaensis, Cyanea glabra, Cyanea grimesiana* ssp. *grimesiana, Cyanea hamatiflora* ssp. *hamatiflora, Cyanea lobata, Cyanea mceldowneyi, Cyrtandra munroi, Delissea undulata, Diellia erecta, Diplazium molokaiense, Dubautia plantaginea* ssp. *humilis, Flueggea neowawraea, Geranium arboreum, Geranium multiflorum, Gouania vitifolia, Hedyotis coriacea, Hedyotis mannii, Hesperomannia arborescens, Hesperomannia arbuscula, Hibiscus brackenridgei, Ischaemum byrone, Isodendrion pyrifolium, Kanaloa kahoolawensis, Lipochaeta kamolensis, Lysimachia lydgatei, Mariscus pennatiformis, Melicope adscendens, Melicope balloui, Melicope knudsenii, Melicope mucronulata, Melicope ovalis, Neraudia sericea, Nototrichium humile, Peucedanum sandwicense, Phlegmariurus mannii, Phyllostegia mannii, Phyllostegia mollis, Phyllostegia parviflora, Plantago princeps, Platanthera holochila, Pteris lidgatei, Remya mauiensis, Sanicula purpurea, Schiedea haleakalensis, Schiedea hookeri, Schiedea nuttallii, Sesbania tomentosa, Solanum incompletum, Spermolepis hawaiiensis, Tetramolopium arenarium, Tetramolopium capillare, Tetramolopium remyi, Vigna o-wahuensis*, and *Zanthoxylum hawaiiense.* This information included the known locations, site-specific species information from the HINHP database and our own rare plant database; species information from the Center for Plant Conservation's (CPC's) rare plant monitoring database housed at the University of Hawaii's Lyon Arboretum; island-wide Geographic Information System (GIS) coverages (*e.g.*, vegetation, soils, annual rainfall, elevation contours, land ownership); the final listing rules for these 69 species; the December 18, 2000, proposal; the April 3, 2002, revised proposal; information received during the public comment periods and the public hearings; recent biological surveys and reports; our recovery plans for these species; any species and management information received from landowners, land managers, and interested parties for the islands of Maui and Kahoolawe; discussions with botanical experts; and recommendations from the Hawaii and Pacific Plant Recovery Coordinating Committee (HPPRCC) (see also the discussion below) (GDSI 2000; HINHP Database 2000; HPPRCC 1998; Service 1995a, 1995b, 1996a, 1996b, 1997, 1998a, 1998b, 1999, 2001; 65 FR 66808; 67 FR 3940; 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* (Service 1999). The HPPRCC expects there will be subsequent efforts to further refine the locations of important habitat areas and that new survey information or research may also lead to additional refinement of identifying and mapping of habitat important for the recovery of these species.

The HPPRCC identified essential habitat areas for all listed, proposed, and candidate plants and evaluated species of concern to determine if essential habitat areas would provide for their habitat needs. However, the HPPRCC's mapping of habitat is distinct from the regulatory designation of critical habitat as defined by the Act. More data have been collected since the recommendations made by the HPPRCC in 1998. Much of the area that was identified by the HPPRCC as inadequately surveyed has now been surveyed to some degree. New location data for many species have been gathered. Also, the HPPRCC identified areas as essential based on species clusters (areas that included listed species, as well as candidate species and species of concern) while we have only delineated areas that are essential for the conservation of the specific listed species at issue. As a result, the critical habitat designations in this rule include not only some habitat that was identified as essential in the 1998 recommendations but also habitat that was not identified as essential in those recommendations.

Primary Constituent Elements

In accordance with section 3(5)(A)(i) of the Act and regulations at 50 CFR 424.12, in determining which areas to propose as critical habitat, we are required to base critical habitat determinations on the best scientific and commercial data available and to consider those physical and biological features (primary constituent elements) that are essential to the conservation of the species and that may require special management considerations or protection. These features 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.

Much of what is known about the specific physical and biological requirements of *Alectryon macrococcus, Argyroxiphium sandwicense* ssp. *macrocephalum, Asplenium fragile* var. *insulare, Bidens micrantha* ssp. *kalealaha, Bonamia menziesii, Brighamia rockii, 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, Gouania vitifolia, Hedyotis coriacea, Hedyotis mannii, Hesperomannia arbuscula, Hibiscus brackenridgei, Ischaemum byrone, Isodendrion pyrifolium, Kanaloa kahoolawensis, Lipochaeta kamolensis, Lysimachia lydgatei, Mariscus pennatiformis, Melicope adscendens, Melicope balloui, Melicope knudsenii, Melicope mucronulata, Melicope ovalis, Neraudia sericea, Nototrichium humile, Peucedanum sandwicense, Phlegmariurus mannii, Phyllostegia mannii, Phyllostegia mollis, Plantago princeps, Platanthera holochila, Pteris lidgatei, Remya mauiensis, Sanicula purpurea, Schiedea haleakalensis, Sesbania tomentosa, Spermolepis hawaiiensis, Tetramolopium capillare, Tetramolopium remyi, Vigna o-wahuensis, and *Zanthoxylum hawaiiense* is described in the ''Background'' section of this final rule.

We are unable to identify these features for *Adenophorus periens, Clermontia peleana, Delissea undulata, Phyllostegia parviflora, Schiedea hookeri, Schiedea nuttallii, Solanum incompletum,* and *Tetramolopium arenarium,* which no longer occur on the islands of Maui and Kahoolawe, because information on the physical and biological features (*i.e.*, the primary constituent elements) that are considered essential to the conservation of these eight species on Maui and Kahoolawe is not known. Therefore, we are not designating critical habitat for these species on Maui. We are able to identify these features for *Hesperomannia arborescens,* but we are not designating critical habitat for this species on Maui for the reasons given in the ''*Analysis of Impacts Under Section 4(b)(2): Other Impacts*'' section.

All areas designated as critical habitat are within the historical range of the 60 species at issue and contain one or more of the physical or biological features (primary constituent elements) essential for the conservation of the species.

As described in the discussions for each of the 60 species for which we are designating critical habitat, we are defining the primary constituent elements on the basis of the habitat features of the areas from which the plant species are reported, as described by the type of plant community (*e.g.*, mesic *Metrosideros polymorpha* forest), associated native plant species, locale information (*e.g.*, steep rocky cliffs, talus slopes, gulches, stream banks), and elevation. The habitat features provide the ecological components required by the plant. The type of plant community and associated native plant species indicate specific microclimate (localized climatic) conditions, retention and availability of water in the soil, soil microorganism community, and nutrient cycling and availability. The locale indicates information on soil type, elevation, rainfall regime, and temperature. Elevation indicates information on daily and seasonal temperature and sun intensity. Therefore, the descriptions of the physical elements of the locations of each of these species, including habitat type, plant communities associated with the species, location, and elevation, as described in the ''*Supplementary Information: Discussion of the Plant Taxa*'' section above, constitute the primary constituent elements for these species on the islands of Maui and Kahoolawe.

Criteria Used To Identify Critical Habitat

The lack of detailed scientific data on the life history of these plant species makes it impossible for us to develop a robust quantitative model (*e.g.*, population viability analysis (National Research Council 1995)) to identify the optimal number, size, and location of critical habitat units to achieve recovery (Beissinger and Westphal 1998; Burgman *et al.* 2001; Ginzburg *et al.* 1990; Karieva and Wennergren 1995; Menges 1990; Murphy *et al.* 1990; Taylor 1995). However, based on the best information available at this time, including information on which the listing of these species was based, as well as their recovery plans, we have concluded that the current size and distribution of the extant populations are not sufficient to expect a reasonable probability of long-term survival and recovery of these plant species.

For each of these species, the overall recovery strategy outlined in the approved recovery plans includes: (1) Stabilization of existing wild populations; (2) protection and management of habitat; (3) enhancement of existing small populations and reestablishment of new populations within historic range; and (4) research on species biology and ecology (Service 1995a, 1995b, 1996a, 1996b, 1997, 1998a, 1998b, 1999, 2001). Thus, the long-term recovery of these species is dependent upon the protection of existing population sites and potentially suitable unoccupied habitat within their historic range.

The overall recovery goal stated in the recovery plans for each of these species includes the establishment of 8 to 10 populations with a minimum of 100 mature, reproducing individuals per population for long-lived perennials, 300 mature, reproducing individuals per population for short-lived perennials, and 500 mature, reproducing individuals per population for annuals. (There is one specific exception to this general recovery goal of 8 to 10 populations for species that are believed to be very narrowly distributed on a single island. The recovery goal for *Argyroxiphium sandwicense* ssp. *macrocephalum* is one population of more than 50,000 individuals, and the critical habitat designations reflect this exception for this species.)

To be considered recovered, the populations of a multi-island species should be distributed among the islands of its known historic range (Service 1995a, 1995b, 1996a, 1996b, 1997, 1998a, 1998b, 1999, 2001). A population, for the purposes of this discussion and as defined in the recovery plans for these species, is a unit in which the individuals could be regularly cross-pollinated and influenced by the same small-scale events (such as landslides), and that contains a minimum of 100, 300, or 500 mature, reproducing individuals, depending on whether the species is a long-lived perennial, short-lived perennial, or annual.

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

of extinction and be adaptable to environmental change through evolution and migration.

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

The HPPRCC also recommended the conservation and establishment of 8 to 10 populations to address the numerous risks to the long-term survival and conservation of Hawaiian plant species. Although absent the detailed information inherent to the types of population viability analysis models described above (Burgman *et al.* 2001), this approach employs two widely recognized and scientifically accepted goals for promoting viable populations of listed species: (1) Creation or maintenance of multiple populations so that a single or series of catastrophic events cannot destroy the entire listed species (Luijten *et al.* 2000; Menges 1990; Quintana-Ascencio and Menges 1996); and (2) increasing the size of each population in the respective critical habitat units to a level where the threats of genetic, demographic, and normal environmental uncertainties are diminished (Hendrix and Kyhl 2000; Luijten *et al.* 2000; Meffe and Carroll 1996; Podolsky 2001; Service 1997; Tear *et al.* 1995; Wolf and Harrison 2001). In general, the larger the number of populations and the larger the size of each population, the lower the probability of extinction (Meffe and Carroll 1996; Raup 1991). This basic conservation principle of redundancy applies to Hawaiian plant species. By maintaining 8 to 10 viable populations in several critical habitat units, the threats represented by a fluctuating environment are alleviated and the species has a greater likelihood of achieving long-term survival and recovery. Conversely, loss of one or more of the plant populations within any critical habitat unit could result in an increase in the risk that the entire listed species may not survive and recover.

Due to the reduced size of suitable habitat areas for these Hawaiian plant species, they are now more susceptible to the variations and weather fluctuations affecting quality and quantity of available habitat, as well as direct pressure from hundreds of species of nonnative plants and animals. Establishing and conserving 8 to10 viable populations on one or more islands within the historic range of the species will provide each species with a reasonable expectation of persistence and eventual recovery, even with the high potential that one or more of these populations will be eliminated by normal or random adverse events, such as the hurricanes that occurred in 1982 and 1992 on Kauai, fires, and nonnative plant invasions (HPPRCC 1994; Luijten *et al.* 2000; Mangel and Tier 1994; Pimm *et al.* 1998; Stacey and Taper 1992). We conclude that designation of adequate suitable habitat for 8 to 10 populations as critical habitat is essential to give the species a reasonable likelihood of long-term survival and conservation, based on currently available information.

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

In this rule, we have defined the primary constituent elements based on the general habitat features of the areas from which the plants are reported, such as the type of plant community, the associated native plant species, the physical location (*e.g.*, steep rocky cliffs, talus slopes, stream banks), and elevation. The areas we are designating as critical habitat provide some or all of the habitat components essential for the conservation of the 60 plant species.

Our approach to delineating critical habitat units was applied in the following manner:

(1) Critical habitat was proposed and will be designated on an island by island basis for ease of understanding for landowners and the public, for ease of conducting the public hearing process, and for ease of conducting public outreach. In Hawaii, landowners and the public are most interested and affected by issues centered on the island on which they reside.

(2) We focused on designating units representative of the known current and historical geographic and elevational range of each species; and

(3) We designated critical habitat units to allow for expansion of existing wild populations and reestablishment of wild populations within the historic range, as recommended by the recovery plans for each species.

The proposed critical habitat units were delineated by creating rough units for each species by screen digitizing polygons (map units) using ArcView (Environmental Systems Research Institute, Inc.), a computer GIS program. The polygons were created by overlaying current and historic plant location points onto digital topographic maps of each of the islands.

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

These shape files of suitable habitat were further evaluated. Several factors were used to delineate the proposed critical habitat units from these land areas. We reviewed the recovery objectives as described above and in recovery plans for each of the species to determine if the number of populations and population size requirements needed for conservation would be available within the suitable habitat units identified as containing the

appropriate primary constituent elements for each species. If more than the area needed for the number of recovery populations was identified as potentially suitable, only those areas within the least disturbed suitable habitat were included as proposed critical habitat. A population for this purpose is defined as a discrete aggregation of individuals located a sufficient distance from a neighboring aggregation such that the two are not affected by the same small-scale events and are not believed to be consistently cross-pollinated. In the absence of more specific information indicating the appropriate distance to assure limited cross-pollination, we are using a distance of 1,000 m (3,280 ft) based on our review of current literature on gene flow (Barret and Kohn 1991; Fenster and Dudash 1994; Havens 1998; Schierup and Christiansen 1996).

The resulting critical habitat units were further refined by using satellite imagery and parcel data to eliminate areas that did not contain the appropriate vegetation or associated native plant species, as well as features such as cultivated agriculture fields, housing developments, and other areas that are unlikely to contribute to the conservation of one or more of the 61 plant species for which critical habitat was proposed on April 3, 2002. Geographic features (ridge lines, valleys, streams, coastlines, etc.) or manmade features (roads or obvious land use) that created an obvious boundary for a unit were used as unit area boundaries.

Following publication of the proposed critical habitat rules, some of which were revised, for 255 Hawaiian plants (67 FR 3940, 67 FR 9806, 67 FR 15856, 67 FR 16492, 67 FR 34522, 67 FR 36968, 67 FR 37108), we re-evaluated proposed critical habitat, Statewide, for each species using the applicable recovery guidelines (generally 8 to 10 populations with a minimum of 100 mature, reproducing individuals per population for long-lived perennials; 300 mature, reproducing individuals per population for short-lived perennials; and 500 mature, reproducing individuals per population for annuals) to determine if we had inadvertently proposed for designation too much or too little habitat to meet the essential recovery goals of 8 to 10 populations per species distributed among the islands of the species' known historic range (HINHP Database 2000, 2001; Wagner *et al.* 1990, 1999).

Based on comments and information we received during the comment periods, we assessed the proposed critical habitat in order to ascertain which areas contained the highest quality habitat, had the highest likelihood of species conservation, and were geographically distributed within the species' historical range and located a sufficient distance from each other such that populations of a single species are unlikely to be impacted by a single catastrophic event. We ranked areas of the proposed critical habitat by the quality of the primary constituent elements (*e.g.,* intact native plant communities, predominance of associated native plants versus nonnative plants), potential as a conservation area (*e.g.,* whether the land is zoned for conservation or whether the landowner is already participating in plant conservation actions), and current or expected management of known threats (*e.g.,* ungulate control; weed control; nonnative insect, slug, and snail control). Areas that are zoned for conservation or have been identified as a State Forest Reserve, NAR, Wildlife Preserve, State Park, or are managed for conservation by a private landowner have a high likelihood of providing conservation benefit to the species and are therefore more essential than other comparable habitat outside of those types of areas.

Areas that contain high quality primary constituent elements and conservation potential (*e.g.,* are zoned for conservation and have ongoing or expected threat abatement actions) were ranked the most essential. This ranking process also included determining which habitats were representative of the historic geographical and ecological distributions of the species (see ''Primary Constituent Elements''). Of these most essential areas, we selected adequate area to provide for 8 to 10 populations distributed among the islands of each species' historical range. Of the proposed critical habitat for a species, areas that were not ranked most essential to provide habitat for populations above the recovery goal of 8 to 10 populations were determined not essential for the conservation of the species and were excluded from the final designation.

In selecting areas of designated critical habitat, we made an effort to avoid developed areas, such as towns and other similar lands, that are unlikely to contribute to the conservation of the 60 species. However, the minimum mapping unit that we used to approximate our delineation of critical habitat for these species did not allow us to exclude all such developed areas from the maps. In addition, existing manmade features and structures within the boundaries of the mapped unit, such as buildings; roads; aqueducts and other water system features—including but not limited to pumping stations, irrigation ditches, pipelines, siphons, tunnels, water tanks, gaging stations, intakes, reservoirs, diversions, flumes, and wells; existing trails; campgrounds and their immediate surrounding landscaped area; scenic lookouts; remote helicopter landing sites; existing fences; telecommunications towers and associated structures and equipment; electrical transmission lines and distribution, and communication facilities and regularly maintained associated rights-of-way and access ways; radars, and telemetry antennas; missile launch sites; arboreta and gardens; heiau (indigenous places of worship or shrines) and other archaeological sites; airports; other paved areas; and lawns and other rural residential landscaped areas do not contain one or more of the primary constituent elements and are therefore excluded under the terms of the final regulation. Federal actions limited to those areas would not trigger a section 7 consultation unless they affect the species or primary constituent elements in adjacent critical habitat.

In summary, for these species we utilized the approved recovery plan guidance to identify appropriately sized land units containing essential occupied and unoccupied habitat. Based on the best available information, we believe these areas constitute the essential habitat on Maui and Kahoolawe to provide for the recovery of these 60 species.

The approximate areas of the designated critical habitat by land ownership or jurisdiction are shown in Table 4.

TABLE 4.—APPROXIMATE CRITICAL HABITAT DESIGNATED AREA BY UNIT AND LAND OWNERSHIP OR JURISDICTION, MAUI COUNTY, HAWAII

Unit name	State/local	Private	Federal	Total
Maui 1—*Centaurium sebaeoides*—a	70 ha (174 ac)	<1 ha (<1 ac)		70 ha (174 ac)
Maui 1—*Sesbania tomentosa*—a	38 ha (94 ac)	<1 ha (<1 ac)		38 ha (94 ac)
Maui 2—*Brighamia rockii*—a	5 ha (14 ac)	<1 ha (<1 ac)		5 ha (14 ac)
Maui 2—*Brighamia rockii*—b	17 ha (42 ac)	<1 ha (<1 ac)		17 ha (42 ac)
Maui 2—*Centaurium sebaeoides*—b	14 ha (35 ac)	12 ha (30 ac)		26 ha (65 ac)
Maui 3—*Brighamia rockii*—c	<1 ha (<1 ac)	3 ha (9 ac)		3 ha (9 ac)
Maui 4—*Brighamia rockii*—d	1 ha (2 ac)			1 ha (2 ac)
Maui 4—*Peucedanum sandwicense*—a.	1 ha (2 ac)			1 ha (2 ac)
Maui 5—*Brighamia rockii*—e	7 ha (16 ac)			7 ha (16 ac)
Maui 6—*Ischaemum byrone*—a	15 ha (35 ac)	3 ha (7 ac)		18 ha (42 ac)
Maui 6—*Mariscus pennatiformis*—a	17 ha (40 ac)	13 ha (34 ac)		30 ha (74 ac)
Maui 7—*Ischaemum byrone*—b	11 ha (27 ac)			11 ha (27 ac)
Maui 8—*Cyanea copelandii* ssp. *haleakalaensis*—a.	5 ha (13 ac)	496 ha (1,225 ac)		501 ha (1,238 ac)
Maui 8—*Cyanea glabra*—a	448 ha (1,108 ac)	2 ha (4 ac)		450 ha (1,112 ac)
Maui 8—*Cyanea hamatiflora* ssp. *hamatiflora*—a.	48 ha (119 ac)	563 ha (1,390 ac)		611 ha (1,509 ac)
Maui 8—*Cyanea mceldowneyi*—a	489 ha (1,208 ac)	1,638 ha (4,047 ac)		2,127 ha (5,255 ac)
Maui 8—*Diplazium molokaiense*—a	87 ha (214 ac)	488 ha (1,206 ac)		575 ha (1,420 ac)
Maui 8—*Geranium multiflorum*—a		46 ha (113 ac)		46 ha (113 ac)
Maui 8—*Melicope balloui*—a	73 ha (181 ac)	78 ha (192 ac)		151 ha (373 ac)
Maui 8—*Phlegmariurus mannii*—a	101 ha (251 ac)	120 ha (297 ac)		221 ha (548 ac)
Maui 8—*Phyllostegia mannii*—a	2 ha (4 ac)	568 ha (1,404 ac)		570 ha (1,408 ac)
Maui 8—*Phyllostegia mollis*—a	128 ha (316 ac)			128 ha (316 ac)
Maui 8—*Zanthoxylum hawaiiense*—a	362 ha (894 ac)	1 ha (1 ac)		363 ha (895 ac)
Maui 9—*Alectryon macrococcus*—a	1,893 ha (4,678 ac)	<1 ha (<1 ac)		1,893 ha (4,678 ac)
Maui 9—*Argyroxiphium sandwicense* ssp. *macrocephalum*—a.	2,117 ha (5,232 ac)	852 ha (2,105 ac)	5,996 ha (14,816 ac)	8,965 ha (22,153 ac)
Maui 9—*Asplenium fragile* var. *insulare*—a.			362 ha (894 ac)	362 ha (894 ac)
Maui 9—*Bidens micrantha* ssp. *kalealaha*—a.	390 ha (965 ac)	629 ha (1,554 ac)	543 ha (1,343 ac)	1,562 ha (3,862 ac)
Maui 9—*Bidens micrantha* ssp. *kalealaha*—b.	2,115 ha (5,229 ac)			2,115 ha (5,229 ac)
Maui 9—*Clermontia lindseyana*—a	177 ha (438 ac)			177 ha (438 ac)
Maui 9—*Clermontia lindseyana*—b	60 ha (149 ac)			60 ha (149 ac)
Maui 9—*Clermontia samuelii*—a	2,777 ha (6,863 ac)		353 ha (872 ac)	3,130 ha (7,735 ac)
Maui 9—*Cyanea copelandii* ssp. *haleakalaensis*—b.	391 ha (966 ac)		1,318 ha (3,258 ac)	1,709 ha (4,224 ac)
Maui 9—*Cyanea glabra*—b			649 ha (1,605 ac)	649 ha (1,605 ac)
Maui 9—*Cyanea glabra*—c	363 ha (897 ac)			363 ha (897 ac)
Maui 9—*Cyanea hamatiflora* ssp. *hamatiflora*—b.	203 ha (503 ac)		1,107 ha (2,732 ac)	1,310 ha (3,235 ac)
Maui 9—*Diellia erecta*—a	2 ha (6 ac)			2 ha (6 ac)
Maui 9—*Diellia erecta*—b	174 ha (432 ac)			174 ha (432 ac)
Maui 9—*Diplazium molokaiense*—b	162 ha (401 ac)			162 ha (401 ac)
Maui 9—*Flueggea neowawraea*—a	52 ha (128 ac)			52 ha (128 ac)
Maui 9—*Geranium arboreum*—a	731 ha (1,806 ac)			731 ha (1,806 ac)
Maui 9—*Geranium multiflorum*—b	322 ha (795 ac)	297 ha (735 ac)	4,198 ha (10,372 ac)	4,817 ha (11,902 ac)
Maui 9—*Geranium multiflorum*—c	183 ha (450 ac)			183 ha (450 ac)
Maui 9—*Lipochaeta kamolensis*—a	1,472 ha (3,638 ac)	2 ha (6 ac)		1,474 ha (3,644 ac)
Maui 9—*Melicope balloui*—b			394 ha (972 ac)	394 ha (972 ac)
Maui 9—*Melicope knudsenii*—a	28 ha (69 ac)			28 ha (69 ac)
Maui 9—*Melicope mucronulata*—a	34 ha (83 ac)			34 ha (83 ac)
Maui 9—*Melicope ovalis*—a	1 ha (2 ac)		933 ha (2,304 ac)	934 ha (2,306 ac)
Maui 9—*Neraudia sericea*—a	623 ha (1,539 ac)			623 ha (1,539 ac)
Maui 9—*Nototrichium humile*—a	382 ha (944 ac)	15 ha (38 ac)		397 ha (982 ac)
Maui 9—*Phlegmariurus mannii*—b	383 ha (947 ac)			383 ha (947 ac)
Maui 9—*Phlegmariurus mannii—c*	224 ha (554 ac)		252 ha (622 ac)	476 ha (1,176 ac)
Maui 9—*Phyllostegia mollis*—b	509 ha (1,256 ac)			509 ha (1,256 ac)
Maui 9—*Plantago princeps*—a			164 ha (406 ac)	164 ha (406 ac)
Maui 9—*Platanthera holochila*—a	32 ha (80 ac)		208 ha (516 ac)	240 ha (596 ac)
Maui 9—*Schiedea haleakalensis*—a			26 ha (64 ac)	26 ha (64 ac)
Maui 9—*Schiedea haleakalensis*—b			77 ha (189 ac)	77 ha (189 ac)
Maui 10—*Alectryon macrococcus*—b	372 ha (918 ac)	30 ha (75 ac)		402 ha (993 ac)
Maui 11—*Lipochaeta kamolensis*—b	42 ha (105 ac)			42 ha (105 ac)
Maui 12—*Vigna o-wahuensis*—a	144 ha (356 ac)			144 ha (356 ac)
Maui 13—*Alectryon macrococcus*—c	419 ha (1,033 ac)			419 ha (1,033 ac)
Maui 13—*Bonamia menziesii*—a	536 ha (1,325 ac)			536 ha (1,325 ac)

TABLE 4.—APPROXIMATE CRITICAL HABITAT DESIGNATED AREA BY UNIT AND LAND OWNERSHIP OR JURISDICTION, MAUI COUNTY, HAWAII—Continued

Unit name	State/local	Private	Federal	Total
Maui 13—*Cenchrus agrimonioides*—a.	237 ha (585 ac)			237 ha (585 ac)
Maui 13—*Colubrina oppositifolia*—a	739 ha (1,827 ac)			739 ha (1,827 ac)
Maui 13—*Flueggea neowawraea*—b	50 ha (124 ac)			50 ha (124 ac)
Maui 13—*Melicope adscendens*—a	160 ha (398 ac)			160 ha (398 ac)
Maui 13—*Melicope knudsenii*—b	163 ha (403 ac)			163 ha (403 ac)
Maui 13—*Melicope mucronulata*—b	194 ha (481 ac)			194 ha (481 ac)
Maui 13—*Sesbania tomentosa*—b	78 ha (193 ac)	1 ha (2 ac)		79 ha (195 ac)
Maui 13—*Spermolepis hawaiiensis*—a.	91 ha (224 ac)			91 ha (224 ac)
Maui 14—*Geranium arboreum*—b	282 ha (697 ac)	170 ha (418 ac)		452 ha (1,115 ac)
Maui 15—*Geranium arboreum*—c	177 ha (437 ac)	490 ha (1,211 ac)		667 ha (1,648 ac)
Maui 16—*Hibiscus brackenridgei*—a		212 ha (524 ac)		212 ha (524 ac)
Maui 17—*Alectryon macrococcus*—d	209 ha (517 ac)	181 ha (448 ac)		390 ha (965 ac)
Maui 17—*Alectryon macrococcus*—e	110 ha (270 ac)	<1 ha (1 ac)		110 ha (271 ac)
Maui 17—*Cenchrus agrimonioides*—b.	118 ha (292 ac)	<1 ha (1 ac)		118 ha (293 ac)
Maui 17—*Clermontia oblongifolia* ssp. *mauiensis*—a.	16 ha (40 ac)	<1 ha (<1 ac)		16 ha (40 ac)
Maui 17—*Clermontia oblongifolia* ssp. *mauniensis*—b.	696 ha (1,720 ac)	<1 ha (<1 ac)		696 ha (1,720 ac)
Maui 17—*Clermontia oblongifolia* ssp. *mauiensis*—c.	293 ha (726 ac)	<2 ha (6 ac)		295 ha (732 ac)
Maui 17—*Colubrina oppositifolia*—b	132 ha (327 ac)	44 ha (108 ac)		176 ha (435 ac)
Maui 17—*Ctenitis squamigera*—a	953 ha (2,356 ac)	1,026 ha (2,534 ac)		1,979 ha (4,890 ac)
Maui 17—*Ctenitis squamigera*—b	478 ha (1,181 ac)	338 ha (837 ac)		816 ha (2,018 ac)
Maui 17—*Ctenitis squamigera*—c	137 ha (336 ac)	<1 ha (1 ac)		137 ha (337 ac)
Maui 17—*Cyanea glabra*—d	255 ha (630 ac)			255 ha (630 ac)
Maui 17—*Cyanea glabra*—e	264 ha (652 ac)	207 ha (511 ac)		471 ha (1,163 ac)
Maui 17—*Cyanea glabra*—f	188 ha (463 ac)	<1 ha (1 ac)		188 ha (464 ac)
Maui 17—*Cyanea glabra*—g		79 ha (194 ac)		79 ha (194 ac)
Maui 17—*Cyanea grimesiana* ssp. *grimesiana*—a.	10 ha (24 ac)	911 ha (2,249 ac)		921 ha (2,273 ac)
Maui 17—*Cyanea lobata*—a	132 ha (322 ac)	<1 ha (1 ac)		132 ha (323 ac)
Maui 17—*Cyanea lobata*—b	112 ha (276 ac)	2 ha (5ac)		114 ha (281 ac)
Maui 17—*Cyanea lobata*—c	578 ha (1,427 ac)	<1 ha (<1 ac)		578 ha (1,427 ac)
Maui 17—*Cyrtandra munroi*—a	156 ha (385 ac)	<1 ha (1 ac)		156 ha (386 ac)
Maui 17—*Cyrtandra munroi*—b	25 ha (62 ac)	213 ha (528 ac)		238 ha (590 ac)
Maui 17—*Cyrtandra munroi*—c	603 ha (1,490 ac)	<1 ha (<1 ac)		603 ha (1,490 ac)
Maui 17—*Diellia erecta*—c	22 ha (55 ac)			22 ha (55 ac)
Maui 17—*Diellia erecta*—d		70 ha (172 ac)		70 ha (172 ac)
Maui 17—*Diellia erecta*—e	12 ha (30 ac)			12 ha (30 ac)
Maui 17—*Diellia erecta*—f	14 ha (34 ac)			14 ha (34 ac)
Maui 17—*Diplazium molokaiense*—c	30 ha (74 ac)	1,465 ha (3,619 ac)		1,495 ha (3,693 ac)
Maui 17—*Dubautia plantaginea* ssp. *humilis*—a.	66 ha (164 ac)	227 ha (550 ac)		293 ha (723 ac)
Maui 17—*Dubautia plantaginea* ssp. *humilis*—b.	68 ha (168 ac)	46 ha (115 ac)		114 ha (283 ac)
Maui 17—*Dubautia plantaginea* ssp. *humulis*—c.	27 ha (66 ac)	68 ha (168 ac)		95 ha (234 ac)
Maui 17—*Gouania vitifolia*—a	446 ha (1,103 ac)	40 ha (95 ac)		486 ha (1,198 ac)
Maui 17—*Hedyotis coriacea*—a	106 ha (262 ac)	<1 ha (<1 ac)		106 ha (262 ac)
Maui 17—*Hedyotis coriacea*—b	138 ha (340 ac)			138 ha (340 ac)
Maui 17—*Hedyotis mannii*—a	572 ha (1,414 ac)	1,662 ha (4,107 ac)		2,234 ha (5,521 ac)
Maui 17—*Hesperomannia arbuscula*—a.	378 ha (933 ac)	14 ha (35 ac)		392 ha (968 ac)
Maui 17—*Hesperomannia arbuscula*—b.		436 ha (1,076 ac)		436 ha (1,076 ac)
Maui 17—*Hibiscus brackenridgei*—b	593 ha (1,463 ac)	74 ha (182 ac)		667 ha (1,645 ac)
Maui 17—*Isodendrion pyrifolium*—a	224 ha (555 ac)	<1 ha (<1 ac)		224 ha (555 ac)
Maui 17—*Lysimachia lydgatei*—a	64 ha (157 ac)	26 ha (64 ac)		90 ha (221 ac)
Maui 17—*Lysimachia lydgatei*—b	42 ha (104 ac)	116 ha (287 ac)		158 ha (391 ac)
Maui 17—*Lysimachia lydgatei*—c	19 ha (46 ac)	28 ha (70 ac)		47 ha (116 ac)
Maui 17—*Lysimachia lydgatei*—d	28 ha (70 ac)	70 ha (172 ac)		98 ha (242 ac)
Maui 17—*Lysimachia lydgatei*—e	18 ha (44 ac)			18 ha (44 ac)
Maui 17—*Neraudia sericea*—b	1,026 (2,538 ac)	ha 162 ha (400 ac)		1,188 ha (2,938 ac)
Maui 17—*Peucedanum sandwicense*—b.		117 ha (289 ac)		117 ha (289 ac)
Maui 17—*Phlegmariurus mannii*—d	57 ha (141 ac)	<1 ha (<1 ac)		57 ha (141 ac)
Maui 17—*Phlegmariurus mannii*—e	29 ha (72 ac)	6 ha (15 ac)		35 ha (87 ac)
Maui 17—*Plantago princeps*—b	23 ha (57 ac)	304 ha (750 ac)		327 ha (807 ac)

TABLE 4.—APPROXIMATE CRITICAL HABITAT DESIGNATED AREA BY UNIT AND LAND OWNERSHIP OR JURISDICTION, MAUI COUNTY, HAWAII—Continued

Unit name	State/local	Private	Federal	Total
Maui 17—*Platanthera holochila*—b	4 ha (10 ac)	4 ha (9 ac)		8 ha (19 ac)
Maui 17—*Platanthera holochila*—c	189 ha (466 ac)	<1 ha (<1 ac)		189 ha (466 ac)
Maui 17—*Pteris lidgatei*—a	504 ha (1,246 ac)	664 ha (1,641 ac)		1,168 ha (2,887 ac)
Maui 17—*Pteris lidgatei*—b		163 ha (403 ac)		163 ha (403 ac)
Maui 17—*Remya mauiensis*—a	227 ha (562 ac)	1 ha (2 ac)		228 ha (564 ac)
Maui 17—*Remya mauiensis*—b	366 ha (904 ac)	201 ha (496 ac)		567 ha (1,400 ac)
Maui 17—*Remya mauiensis*—c	31 ha (78 ac)	<1 ha (<1 ac)		31 ha (78 ac)
Maui 17—*Sanicula purpurea*—a	29 ha (70 ac)	5 ha (13 ac)		34 ha (83 ac)
Maui 17—*Sanicula purpurea*—b	97 ha (240 ac)	209 ha (516 ac)		306 ha (756 ac)
Maui 17—*Sanicula purpurea*—c		8 ha (19 ac)		8 ha (19 ac)
Maui 17—*Spermolepis hawaiiensis*—b.	23 ha (56 ac)			23 ha (56 ac)
Maui 17—*Tetramolopium capillare*—a.	1,106 ha (2,732 ac)	676 ha (1,672 ac)		1,782 ha (4,404 ac)
Maui 17—*Tetramolopium remyi*—a	216 ha (536 ac)	71 ha (176 ac)		287 ha (712 ac)
Maui 18—*Alectryon macrococcus*—f	5 ha (11 ac)	3 ha (6 ac)		8 ha (17 ac)
Maui 18—*Colubrina oppositifolia*—c	38 ha (92 ac)	26 ha (63 ac)		64 ha (155 ac)
Maui 18—*Ctenitis squamigera*—d	10 ha (24 ac)	4 ha (10 ac)		14 ha (34 ac)
Maui 18—*Remya mauiensis*—d	1 ha (3 ac)	1 ha (3 ac)		2 ha (6 ac)
Kahoolawe 1—*Kanaloa kahoolawensis*—a.	562 ha (1,388 ac)			562 ha (1,388 ac)
Kahoolawe 2—*Kanaloa kahoolawensis*—b.	613 ha (1,515 ac)			613 ha (1,515 ac)
Kahoolawe 3—*Kanaloa kahoolawensis*—c.	5 ha (12 ac)			5 ha (12 ac)
Total*	21,229 ha (52,458 ac)	8,858 ha (21,890 ac)	8,805 ha (21,757 ac)	38,897 ha (96,115 ac)

*Totals take into consideration overlapping individual species units.

TABLE 5.—APPROXIMATE FINAL CRITICAL HABITAT AREA (HA (AC)), ESSENTIAL AREA, AND EXCLUDED AREA ON MAUI AND KAHOOLAWE

Area considered essential on Maui	48,352 ha (119,480 ac)
Area not included because of special management or protection (State upper Hanawi NAR, ML&P Puu Kukui WMA, and TNCH Kupunukea and Waikamoi Preserves) on Maui.	6,741 ha (16,657 ac)
Area excluded under 4(b)(2) (Haleakala and Ulupalakua Ranches) on Maui	3,894 ha (9,622 ac)
Final Critical Habitat on Maui	37,717 ha (93,200 ac)
Final Critical Habitat on Kahoolawe	1,180 ha (2,915 ac)
Total Critical Habitat on Maui and Kahoolawe	38,897 ha (96,115)

Critical habitat includes habitat for 59 species primarily in the upland portions of Maui, and for one species on Kahoolawe. Lands designated as critical habitat have been divided into a total of 139 units. A brief description of each unit is presented below.

Descriptions of Critical Habitat Units

Maui 9—*Alectryon macrococcus*—a

This unit is critical habitat for *Alectryon macrococcus* and is 1,893 ha (4,678 ac) on State and privately owned lands. The unit contains Auwahi and Manawainui gulches including portions of Lualailua Hills, Puu Kao, and Kamole and Kepuni gulches. It, in combination with Maui 10—*Alectryon macrococcus*—b, Maui 13—*Alectryon macrococcus*—c, and land on Ulupalakua and Haleakala ranches, provides habitat for two populations of 100 mature, reproducing individuals of the long-lived perennial *A. macrococcus* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, mesic to wetter mesic and upper dryland forest. This unit is essential to conservation of the species because it provides for two populations within this multi-island species' historical range on Maui that are some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 10—*Alectryon macrococcus*—b

This unit is critical habitat for *Alectryon macrococcus* and is 402 ha (993 ac) on State (Kahikinui Forest Reserve) and privately owned land. The unit contains land from Pahihi Gulch to Kahalulu Gulch. It, in combination with Maui 9—*Alectryon macrococcus*—a, Maui 13—*Alectryon macrococcus*—c, and Haleakala and Ulupalakua ranches, provides habitat for two populations of 100 mature, reproducing individuals of the long-lived perennial *A. macrococcus* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, mesic to wetter mesic and upper dryland forest. This unit is essential to conservation of the species because it provides for two populations within this multi-island species' historical range on Maui that are some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 13—*Alectryon macrococcus*—c

This unit is critical habitat for *Alectryon macrococcus* and is 419 ha (1,033 ac) on State-owned land (Kanaio NAR). The unit contains the area below

Puu Ouli. It, in combination with Ulupalakua and Haleakala ranches, and Maui 9—*Alectryon macrococcus*—a and Maui 10—*Alectryon macrococcus*—b, provides habitat for 2 populations of 100 mature, reproducing individuals of the long-lived perennial *A. macrococcus* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, mesic to wetter mesic and upper dryland forest. This unit is essential to conservation of the species because it provides for two populations within this multi-island species' historical range on Maui that are some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 17—*Alectryon macrococcus*—d

This unit is critical habitat for *Alectryon macrococcus* and is 390 ha (965 ac) on State (West Maui Forest Reserve and the Panaewa Section of West Maui NAR) and privately owned land. The unit contains portions of Wahikuli and Kealii gulches and Puuiki, Kahoma, and Kanaha streams. It, in combination with Maui 17—*Alectryon macrococcus*—e, Maui 18—*Alectryon macrococcus*—f, and Kapunakea Preserve, provides habitat for two populations of 100 mature, reproducing individuals of the long-lived perennial *A. macrococcus* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, mesic to wetter mesic and upper dryland forest. This unit is essential to conservation of the species because it provides for two populations within this multi-island species' historical range on Maui that are some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 17—*Alectryon macrococcus*—e

This unit is critical habitat for *Alectryon macrococcus* and is 110 ha (271 ac) on State (West Maui Forest Reserve) and privately owned land. The unit contains Honokowai Stream. It, in combination with Maui 17—*Alectryon macrococcus*—d, Maui 18—*Alectryon macrococcus*—f and Kapunakea Preserve, provides habitat for two populations of 100 mature, reproducing individuals of the long-lived perennial *A. macrococcus* and is currently occupied by three plants. The habitat features contained in this unit that are essential for this species include, but are not limited to, mesic to wetter mesic and upper dryland forest. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 18—*Alectryon macrococcus*—f

This unit is critical habitat for *Alectryon macrococcus* and is 8 ha (17 ac) on State (West Maui Forest Reserve) and privately owned land. The unit contains Honokawai Valley. It, in combination with Maui 17—*Alectryon macrococcus*—d, Maui 17—*Alectryon macrococcus*—e, and Kapunakea Preserve, provides habitat for two populations of 100 mature, reproducing individuals of the long-lived perennial *A. macrococcus* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, mesic to wetter mesic and upper dryland forest. This unit is essential to conservation of the species because it provides for two populations within this multi-island species' historical range on Maui that are some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 9—*Argyroxiphium sandwicense* ssp. *macrocephalum*—a

This unit is critical habitat for *Argyroxiphium sandwicense* ssp. *macrocephalum* and is 8,965 ha (22,153 ac) on State (Kula and Kahikinui Forest Reserve), Federal (Haleakala National Park), and privately owned land. The unit contains portions of Halalii Summit, Haleakala Summit, Haleakala Crater, Hanakauhi Summit, Haupaakea Peak Summit, Hina Summit, Honokahua Summit, Ka Moa o Pele Summit, Kalahaku Pali, Kalepeamoa Summit, Kalua Awa Summit, Kaluaiki Crater, Kaluanui Crater, Kaluu o ka Oo Crater, Kamaolii Summit, Kanahau Summit, Keoneheehee Ridge, Kilohana Summit, Kolekole Summit, Koolau Gap, and Kumuiilahi. It provides habitat for one population of greater than 50,000 mature, reproducing individuals of the long-lived perennial *A. sandwicense* ssp. *macrocephalum* and is currently occupied by 39,000 to 44,000 plants. The habitat features contained in this unit that are essential for this species include, but are not limited to, lava flows with almost no soil development and otherwise barren, unstable slopes of recent (less than several thousand years old) volcanic cinder cones subject to frequent formation of ice at night and extreme heating during cloudless days with an annual precipitation of approximately 75 to 250 cm (29.6 to 98.4 in). This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. Although we do not feel that there is enough habitat designatied to reach the recovery goal of 8 to 10 populations, this species is a very narrow endemic in terms of its alpine habitat requirement, and probably never naturally occurred in more than a single or a few populations.

Maui 9—*Asplenium fragile* var. *insulare*—a

This unit is critical habitat for *Asplenium fragile* var. *insulare* and is 362 ha (894 ac) on federally owned land (Haleakala National Park). The unit contains Koolau Gap. This unit, in combination with Waikamoi Preserve, provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *A. fragile* var. *insulare* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, streamside hollows and grottos in gulches. This unit is essential to conservation of the species because it provides for two populations within this multi-island species' historical range on Maui that are some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 9—*Bidens micrantha* ssp. *kalealaha*—a

This unit is critical habitat for *Bidens micrantha* ssp. *kalealaha* and is 1,562 ha (3,862 ac) on State (Kahikinui Forest Reserve), Federal, and privately owned land. The unit contains portions of Kumuiilahi and Haleakala summits, Pukai, Pahihi, and Waioale gulches, Haleakala Crater, and Kumuiliahi. It provides habitat for 3 populations of 300 mature, reproducing individuals of the short-lived perennial *B. micrantha* ssp. *kalealaha* and is currently occupied by two plants. The habitat features

contained in this unit that are essential for this species include, but are not limited to, blocky lava flows with little or no soil development, deep pit craters, and sheer rock walls in open canopy montane shrubland. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 9—*Bidens micrantha* ssp. *kalealaha*—b

This unit is critical habitat for *Bidens micrantha* ssp. *kalealaha* and is 2,115 ha (5,229 ac) on State-owned land (Kahikinui Forest Reserve). The unit is between Kanaio and Auwahi. It provides habitat for 4 populations of 300 mature, reproducing individuals of the short-lived perennial *B. micrantha* ssp. *kalealaha* and is currently occupied by 10 plants. The habitat features contained in this unit that are essential for this species include, but are not limited to, blocky lava flows with little or no soil development, deep pit craters, and sheer rock walls in open canopy montane shrubland. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 13—*Bonamia menziesii*—a

This unit is critical habitat for *Bonamia menziesii* and is 536 ha (1,325 ac) on State (Kanaio NAR) land. The unit lies in the area between Kanaio and Auwahi. It provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *B. menziesii* and is currently occupied by 5 plants. The habitat features contained in this unit that are essential for this species include, but are not limited to, aa lava in mixed open dry forest; *Erythrina sandwicensis* lowland dry forest, or mesic mixed *Metrosideros polymorpha* forest. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 2—*Brighamia rockii*—a

This unit is critical habitat for *Brighamia rockii* and is 5 ha (14 ac) on State and privately owned land. The unit lies near Lahoole Cape. This unit provides habitat for one population of 100 mature, reproducing individuals of the long-lived perennial *B. rockii* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, rock crevices on steep sea cliffs, often within the spray zone. This unit is essential to conservation of the species because it provides for one population within this multi-island species' historical range on Maui that is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 2—*Brighamia rockii*—b

This unit is critical habitat for *Brighamia rockii* and is 17 ha (42 ac) on State and privately owned land. The unit contains Kaemi, Lahoole, and Moho capes, Makalina Valley, Waiokila and Waiolai gulches, Makamakaole Stream, and Puu Makawana Summit. This unit provides habitat for one population of 100 mature, reproducing individuals of the long-lived perennial *B. rockii* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, rock crevices on steep sea cliffs, often within the spray zone. This unit is essential to conservation of the species because it provides for one population within this multi-island species' historical range on Maui that is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 3—*Brighamia rockii*—c

This unit is critical habitat for *Brighamia rockii* and is 3 ha (9 ac) on State and privately owned land. The unit contains Waikamoi Stream, Waihanepee Stream, and Puohokamoa Stream. This unit in combination with Maui 4—*Brighamia rockii*—d and Maui 5—*Brighamia rockii*—e, provides habitat for one population of 100 mature, reproducing individuals of the long-lived perennial *B. rockii* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, rock crevices on steep sea cliffs, often within the spray zone. This unit is essential to conservation of the species because it provides for one population within this multi-island species' historical range on Maui that is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 4—*Brighamia rockii*—d

This unit is critical habitat for *Brighamia rockii* and is 1 ha (2 ac) on State-owned land. The unit contains all of Keopuka Rock. This unit provides habitat for one population in combination with Maui 3—*Brighamia rockii*—c and Maui 5—*Brighamia rockii*—e, of 100 mature, reproducing individuals of the long-lived perennial *B. rockii* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, rock crevices on steep sea cliffs, often within the spray zone. This unit is essential to conservation of the species because it provides for one population within this multi-island species' historical range on Maui that is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 5—*Brighamia rockii*—e

This unit is critical habitat for *Brighamia rockii* and is 7 ha (16 ac) on State-owned land. The unit contains Moiki Point and Haipuaena Stream. This unit provides habitat for one population in combination with Maui 3—*Brighamia rockii*—c and Maui 4—*Brighamia rockii*—d, of 100 mature, reproducing individuals of the long-lived perennial *B. rockii* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, rock crevices on steep sea cliffs, often within the spray zone. This unit is essential to conservation of the species because it provides for one population within this multi-island species' historical range on Maui that is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the

island from being destroyed by one naturally occurring catastrophic event.

Maui 13—*Cenchrus agrimonioides*—a

This unit is critical habitat for *Cenchrus agrimonioides* and is 237 ha (585 ac) on State (Kanaio NAR) land. The unit contains land between Kanaio and Auwahi. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *C. agrimonioides* and is currently occupied by between one and 10 plants. The habitat features contained in this unit that are essential for this species include, but are not limited to, dry forest or *Pleomele* sp.-*Diospyros* sp. forest. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 17—*Cenchrus agrimonioides*—b

This unit is critical habitat for *Cenchrus agrimonioides* and is 118 ha (293 ac) on State (West Maui Forest Reserve and Manawainui Plant Sanctuary) and privately owned land. The unit contains Papalaua and Manawainui gulches and Hanaulaiki. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *C. agrimonioides* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, dry forest or *Pleomele* sp.-*Diospyros* sp. forest. This unit is essential to conservation of the species because it provides for one population within this multi-island species' historical range on Maui that is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 1—*Centaurium sebaeoides*—a

This unit is critical habitat for *Centaurium sebaeoides* and is 70 ha (174 ac) on non-managed State and privately owned land. The unit contains Alapapa Gulch, Honanana Gulch, Mokolea Point, Owaluhi Gulch, Papanahoa Gulch, Papanalahoa Point, Poelua Bay, and Poelua Gulch. It provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *C. sebaeoides* and is currently occupied by one plant. The habitat features contained in this unit that are essential for this species include, but are not limited to, dry forest or *Pleomele* sp.-*Diospyros* sp. forest. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 2—*Centaurium sebaeoides*—b

This unit is critical habitat for *Centaurium sebaeoides* and is 26 ha (65 ac) on State and privately owned land. The unit contains Alapapa Gulch, Honanana Gulch, Lahoole Cape, Makamakaole Stream, Moho Cape, Mokolea Point, Owaluhi Gulch, Papanahoa Gulch, Papanalahoa Point, Poelua Bay, Poelua Gulch, Waihee Stream, Waihee Valley, Waiokila Gulch, and Waiolai Gulch. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *C. sebaeoides* and is currently occupied by 10 plants. The habitat features contained in this unit that are essential for this species include, but are not limited to, dry forest or *Pleomele* sp.-*Diospyros* sp. forest. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 9—*Clermontia lindseyana*—a

This unit is critical habitat for *Clermontia lindseyana* and is 177 ha (438 ac) on State-owned land. The unit contains Manawainui Gulch. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *C. lindseyana* and is currently occupied by 330 plants. The habitat features contained in this unit that are essential for this species include, but are not limited to, *Acacia koa* mesic forest. This unit is essential to the conservation of the species because it supports an extant colony of this species. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 9—*Clermontia lindseyana*—b

This unit is critical habitat for *Clermontia lindseyana* and is 60 ha (149 ac) on State-owned land (Kula Forest Reserve). The unit contains no named natural features. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *C. lindseyana* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, *Acacia koa* mesic forest. This unit is essential to conservation of the species because it provides for one population within this multi-island species' historical range on Maui that is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 17—*Clermontia oblongifolia ssp. mauiensis*—a

This unit is critical habitat for *Clermontia oblongifolia* ssp. *mauiensis* and is 16 ha (40 ac) on State and privately owned land. The unit contains no named natural features. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *C. oblongifolia* ssp. *mauiensis* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, sides of ridges and ridge tops in *Metrosideros polymorpha*-dominated montane forest. This unit is essential to conservation of the species because it provides for one population within this multi-island species' historical range on Maui that is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 17—*Clermontia oblongifolia* ssp. *mauiensis*—b

This unit is critical habitat for *Clermontia oblongifolia* ssp. *mauiensis* and is 696 ha (1,720 ac) on State (Kahakuloa Section of the West Maui NAR) and privately owned land. The unit contains Eke Crater, Konanano Gulch, and Kahakuloa Valley. This unit provides habitat for 4 populations of 300 mature, reproducing individuals of

the short-lived perennial *C. oblongifolia* ssp. *mauiensis* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, sides of ridges and ridge tops in *Metrosideros polymorpha*-dominated montane forest. This unit is essential to conservation of the species because it provides for four populations within this multi-island species' historical range on Maui that are some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 17—*Clermontia oblongifolia* ssp. *mauiensis*—c

This unit is critical habitat for *Clermontia oblongifolia* ssp. *mauiensis* and is 295 ha (732 ac) on State (Honokowai Section of the West Maui NAR) and privately owned land. The unit contains Violet Lake, Amalu and Kapaloa streams, and Honokowai Valley. This unit provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *C. oblongifolia* ssp. *mauiensis* and is currently occupied by one plant. The habitat features contained in this unit that are essential for this species include, but are not limited to, sides of ridges and ridge tops in *Metrosideros polymorpha*-dominated montane forest. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 9—*Clermontia samuelii*—a

This unit is critical habitat for *Clermontia samuelii* and is 3,130 ha (7,735 ac) on State (Hana and Koolau Forest Reserve) and federally (Haleakala National Park) owned land. The unit contains Anapanapa Lake, Heleleikeoha Stream, Kawakoe Valley, and Kawaipapa Stream. This unit provides habitat for 5 populations of 300 mature, reproducing individuals of the short-lived perennial *C. samuelii* and is currently occupied by 5 plants. The habitat features contained in this unit that are essential for this species include, but are not limited to, wet *Metrosideros polymorpha* and *M. polymorpha-Dicranopteris linearis* forest or wet *M. polymorpha* and *M. polymorpha-Cheirodendron trigynum* forest. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. Although we do not believe that there is enough habitat that currently exists to reach the recovery goal of 8 to 10 populations for this island-endemic species, this unit is of an appropriate size so that each potential population important for the conservation of the species within the unit is geographically separated enough to avoid their destruction by one naturally occurring catastrophic event.

Maui 13—*Colubrina oppositifolia*—a

This unit is critical habitat for *Colubrina oppositifolia* and is 739 ha (1,827 ac) on State (Kanaio NAR) land. The unit contains land between Kanaio and Auwahi. This unit provides habitat for one population of 100 mature, reproducing individuals of the long-lived perennial *C. oppositifolia* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, lowland dry and mesic forests dominated by *Diospyros sandwicensis.* This unit is essential to conservation of the species because it provides for one population within this multi-island species' historical range on Maui that is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 17—*Colubrina oppositifolia*—b

This unit is critical habitat for *Colubrina oppositifolia* and is 176 ha (435 ac) on State (Panaewa Section of the West Maui NAR) and privately owned land. The unit contains Kahoma and Kanaha Valleys and Halona Stream. This unit provides habitat for one population of 100 mature, reproducing individuals of the long-lived perennial *C. oppositifolia* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, lowland dry and mesic forests dominated by *Diospyros sandwicensis.* This unit is essential to conservation of the species because it provides for one population within this multi-island species' historical range on Maui that is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 18—*Colubrina oppositifolia*—c

This unit is critical habitat for *Colubrina oppositifolia* and is 64 ha (155 ac) on State (West Maui Forest Reserve) and privately owned land. The unit contains Honokowai Valley. This unit provides habitat for one population of 100 mature, reproducing individuals of the long-lived perennial *C. oppositifolia* and is currently occupied by one plant. The habitat features contained in this unit that are essential for this species include, but are not limited to, lowland dry and mesic forests dominated by *Diospyros sandwicensis.* This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 17—*Ctenitis squamigera*—a

This unit is critical habitat for *Ctenitis squamigera* and is 1,979 ha (4,890 ac) on State (West Maui Forest Reserve) and privately owned land. The unit contains Hokuula and Puu Lio summits, Nakalaloa and Poohahoahoa streams, and Kapilau Ridge. This unit provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *C. squamigera* and is currently occupied by 30 plants. The habitat features contained in this unit that are essential for this species include, but are not limited to, forest understory in *Metrosideros polymorpha* montane wet forest, mesic forest, or diverse mesic forest. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 17—*Ctenitis squamigera*—b

This unit is critical habitat for *Ctenitis squamigera* and is 816 ha (2,018 ac) on State (Panaewa Section of the West Maui NAR and West Maui Forest Reserve) and privately owned land. The unit contains Wahikuli, Hahakea and

Puuiki gulches, and Kanaha Stream. This unit provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *C. squamigera* and is currently occupied by one plant. The habitat features contained in this unit that are essential for this species include, but are not limited to, forest understory in *Metrosideros polymorpha* montane wet forest, mesic forest, or diverse mesic forest. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 17—*Ctenitis squamigera*—c

This unit is critical habitat for *Ctenitis squamigera* and is 137 ha (337 ac) on State (Honokowai Section of the West Maui NAR and West Maui Forest Reserve) and privately owned land. The unit contains Kapaloa and Amalu Streams. This unit provides habitat for one population, in combination with Maui 18—*Ctenitis squamigera*—d and Kapunakea Preserve, of 300 mature, reproducing individuals of the short-lived perennial *C. squamigera* and is currently occupied by 21 plants. The habitat features contained in this unit that are essential for this species include, but are not limited to, forest understory in *Metrosideros polymorpha* montane wet forest, mesic forest, or diverse mesic forest. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 18—*Ctenitis squamigera*—d

This unit is critical habitat for *Ctenitis squamigera* and is 14 ha (34 ac) on State (West Maui Forest Reserve) and privately owned land. The unit contains no named natural features and provides habitat for one population in combination with Maui 17—*Ctenitis squamigera*—c and Kapunakea Preserve of 300 mature, reproducing individuals of the short-lived perennial *C. squamigera* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, forest understory in *Metrosideros polymorpha* montane wet forest, mesic forest, or diverse mesic forest. This unit is essential to conservation of the species because it provides for one population within this multi-island species' historical range on Maui that is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 8—*Cyanea copelandii* ssp. *haleakalaensis*—a

This unit is critical habitat for *Cyanea copelandii* ssp. *haleakalaensis* and is 501 ha (1,238 ac) on State and privately owned land. The unit contains Opana Gulch, Kailua Stream, and Haiku Uka. This unit provides habitat for 3 populations of 300 mature, reproducing individuals of the short-lived perennial *C. copelandii* ssp. *haleakalaensis* and is currently occupied by one plant. The habitat features contained in this unit that are essential for this species include, but are not limited to, stream banks and wet talus slopes. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 9—*Cyanea copelandii* ssp. *haleakalaensis*—b

This unit is critical habitat for *Cyanea copelandii* ssp. *haleakalaensis* and is 1,709 ha (4,224 ac) on State (Hana Forest Reserve) and federally (Haleakala National Park) owned land. The unit contains Kaumakani Summit, Puu Kue Summit, Kipahulu Valley, Kaukaui Gulch, and Palikea Stream. It provides habitat for 5 populations of 300 mature, reproducing individuals of the short-lived perennial *C. copelandii* ssp. *haleakalaensis* and is currently occupied by 200 plants. The habitat features contained in this unit that are essential for this species include, but are not limited to, stream banks and wet talus slopes. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 8—*Cyanea glabra*—a

This unit is critical habitat for *Cyanea glabra* and is 450 ha (1,112 ac) on State (Makawao Forest Reserve) and privately owned land. The unit contains Wiohiwi Gulch. It provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *C. glabra* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, soil and rock stream banks in wet lowland forest. This unit is essential to conservation of the species because it provides for two populations within this multi-island species' historical range on Maui that are some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 9—*Cyanea glabra*—b

This unit is critical habitat for *Cyanea glabra* and is 649 ha (1,605 ac) on federally owned land (Haleakala National Park). The unit contains Kipahulu Valley, Palikea Stream, and Kaukaui Gulch. It provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *C. glabra* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, soil and rock stream banks in wet lowland forest. This unit is essential to conservation of the species because it provides for two populations within this multi-island species' historical range on Maui that are some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 9—*Cyanea glabra*—c

This unit is critical habitat for *Cyanea glabra* and is 363 ha (897 ac) on State (Hana Forest Reserve) land. The unit contains Waihoi Valley. It provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *C. glabra* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, soil and rock stream

banks in wet lowland forest. This unit is essential to conservation of the species because it provides for one population within this multi-island species' historical range on Maui that is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 17—*Cyanea glabra*—d

This unit is critical habitat for *Cyanea glabra* and is 255 ha (630 ac) on State (West Maui Forest Reserve) land. The unit contains Olowalu Valley and Stream. It provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *C. glabra* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, soil and rock stream banks in wet lowland forest. This unit is essential to conservation of the species because it provides for one population within this multi-island species' historical range on Maui that is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 17—*Cyanea glabra*—e

This unit is critical habitat for *Cyanea glabra* and is 471 ha (1,163 ac) on State (Panaewa Section of the West Maui NAR, and West Maui Forest Reserve) and privately owned land. The unit contains Waihikuli, Hahakea and Puuiki gulches, and Kanaha and Halona streams. It provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *C. glabra* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, soil and rock stream banks in wet lowland forest. This unit is essential to conservation of the species because it provides for two populations within this multi-island species' historical range on Maui that are some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 17—*Cyanea glabra—f*

This unit is critical habitat for *Cyanea glabra* and is 188 ha (464 ac) on State (Honokowai Section of the West Maui NAR, and West Maui Forest Reserve) and privately owned land. The unit contains Amalu and Kapaloa streams. It provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *C. glabra* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, soil and rock stream banks in wet lowland forest. This unit is essential to conservation of the species because it provides for one population within this multi-island species' historical range on Maui that is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 17—*Cyanea glabra*—g

This unit is critical habitat for *Cyanea glabra* and is 79 ha (194 ac) on privately owned land. The unit contains Kauaula Valley. It provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *C. glabra* and is currently occupied by 12 plants. The habitat features contained in this unit that are essential for this species include, but are not limited to, soil and rock stream banks in wet lowland forest. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 17—*Cyanea grimesiana ssp. grimesiana*—a

This unit is critical habitat for *Cyanea grimesiana* ssp. *grimesiana* and is 921 ha (2,273 ac) on State (West Maui Forest Reserve) and privately owned land. The unit contains the Needle Summit, Poohahouhoa Stream, Nakalaloa Stream, and Iao Valley. It provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *C. grimesiana* ssp. *grimesiana* and is currently occupied by fewer than 5 plants. The habitat features contained in this unit that are essential for this species include, but are not limited to, rocky or steep slopes of stream banks in wet forest gulch bottoms. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 8—*Cyanea hamatiflora ssp. hamatiflora*—a

This unit is critical habitat for *Cyanea hamatiflora* ssp. *hamatiflora* and is 611 ha (1,509 ac) on State (Koolau Forest Reserve) and privately owned land. The unit contains Haipuaena Stream, Puohokamoa Stream, and Waikamoi Stream. It provides habitat for 3 populations of 300 mature, reproducing individuals of the short-lived perennial *C. hamatiflora* ssp. *hamatiflora* and is currently occupied by 5 plants. The habitat features contained in this unit that are essential for this species include, but are not limited to, montane wet forest dominated by *Metrosideros polymorpha* with a *Cibotium* sp. and/or native shrub understory or closed *Acacia koa-M. polymorpha* wet forest. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 9—*Cyanea hamatiflora ssp. hamatiflora*—b

This unit is critical habitat for *Cyanea hamatiflora* ssp. *hamatiflora* and is 1,310 ha (3,235 ac) on State (Kipahulu and Hana Forest Reserve) and federally owned (Haleakala National Park) land. The unit contains Puu Ahulili Summit, Kipahulu Valley, Kaumakani Summit, Kaukaui Gulch, and Palikea Stream. It provides habitat for 5 populations of 300 mature, reproducing individuals of the short-lived perennial *C. hamatiflora* ssp. *hamatiflora* and is currently occupied by 13 plants. The habitat features contained in this unit that are essential for this species include, but are not limited to, montane wet forest dominated by *Metrosideros polymorpha* with a *Cibotium* sp. and/or native shrub understory or closed *Acacia koa-M. polymorpha* wet forest. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for

the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 17—*Cyanea lobata*—a

This unit is critical habitat for *Cyanea lobata* and is 132 ha (323 ac) on State (Honokowai Section of the West Maui NAR, and West Maui Forest Reserve) and privately owned land. The unit contains Kapaloa and Amalu Streams. It provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *C. lobata* and is currently occupied by at least one plant. The habitat features contained in this unit that are essential for this species include, but are not limited to, steep stream banks in deep shade in wet forest. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 17—*Cyanea lobata*—b

This unit is critical habitat for *Cyanea lobata* and is 114 ha (281 ac) on State (Panaewa Section of the West Maui NAR) and privately owned land. The unit contains Kauaula Stream. It provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *C. lobata* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, steep stream banks in deep shade in wet forest. This unit is essential to the conservation of the species because it provides for two populations within this multi-island species' historical range on Maui that are some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 17—*Cyanea lobata*—c

This unit is critical habitat for *Cyanea lobata* and is 578 ha (1,427 ac) on State (Kahakuloa Section of the West Maui NAR) and privately owned land. The unit contains Honanana and Kahakuloa Streams. It provides habitat for 3 populations of 300 mature, reproducing individuals of the short-lived perennial *C. lobata* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, steep stream banks in deep shade in wet forest. This unit is essential to the conservation of the species because it provides for three populations within this multi-island species' historical range on Maui that are some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 8—*Cyanea mceldowneyi*—a

This unit is critical habitat for *Cyanea mceldowneyi* and is 2,127 ha (5,255 ac) on State (Makawao and Koolau Forest Reserves) and privately owned land. The unit contains area from Kahakapau Gulch to the rim of Keanae Valley. It provides habitat for 5 populations of 300 mature, reproducing individuals of the short-lived perennial *C. mceldowneyi* and is currently occupied by 33 plants. The habitat features contained in this unit that are essential for this species include, but are not limited to, montane wet and mesic forest with mixed *Metrosideros polymorpha-Acacia koa.* This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. Although we do not feel that there is enough habitat that currently exists to reach the recovery goal of 8 to 10 populations for this island-endemic species, this unit is of an appropriate size so that each potential population important for the conservation of the species within the unit is geographically separated enough to avoid their destruction by one naturally occurring catastrophic event.

Maui 17—*Cyrtandra munroi*—a

This unit is critical habitat for *Cyrtandra munroi* and is 156 ha (386 ac) on State (Honokowai Section of the West Maui NAR, and West Maui Forest Reserve) and privately owned land. The unit contains Amalu Stream. It provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *C. munroi* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, moist to wet, moderately steep talus slopes. This unit is essential to the conservation of the species because it provides for two populations within this multi-island species' historical range on Maui that are some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 17—*Cyrtandra munroi*—b

This unit is critical habitat for *Cyrtandra munroi* and is 238 ha (590 ac) on State and privately owned land. The unit contains Hahakea and Puuiki gulches and Kahoma Stream. It provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *C. munroi* and is currently occupied by at least one plant. The habitat features contained in this unit that are essential for this species include, but are not limited to, moist to wet, moderately steep talus slopes. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 17—*Cyrtandra munroi*—c

This unit is critical habitat for *Cyrtandra munroi* and is 603 ha (1,490 ac) on State (Kahakuloa Section of the West Maui NAR) and privately owned land. The unit contains Kahakuloa Valley, Honanana Gulch, Keahikauo, and Makamakaole Stream. It provides habitat for 3 populations of 300 mature, reproducing individuals of the short-lived perennial *C. munroi* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, moist to wet, moderately steep talus slopes. This unit is essential to the conservation of the species because it provides for three populations within this multi-island species' historical range on Maui that are some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 9—*Diellia erecta*—a

This unit is critical habitat for *Diellia erecta* and is 2 ha (6 ac) on State-owned land (Kula Forest Reserve). The unit contains no named natural features. It provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *D. erecta* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are

not limited to, granular soil with leaf litter and moss on north-facing slopes in deep shade or gulch bottoms. This unit is essential to the conservation of the species because it provides for one population within this multi-island species' historical range on Maui that is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 9—*Diellia erecta*—b

This unit is critical habitat for *Diellia erecta* and is 174 ha (432 ac) on State-owned land. The unit contains Puu Pane. It provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *D. erecta* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, granular soil with leaf litter and moss on north-facing slopes in deep shade or gulch bottoms. This unit is essential to the conservation of the species because it provides for one population within this multi-island species' historical range on Maui that is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 17—*Diellia erecta*—c

This unit is critical habitat for *Diellia erecta* and is 22 ha (55 ac) on State (West Maui Forest Reserve) land. The unit contains Papalaua Gulch. It provides habitat for one population;in combination with Maui 17—*Diellia erecta*—e and Maui 17—*Diellia erecta*—f, f 300 mature, reproducing individuals of the short-lived perennial *D. erecta* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, granular soil with leaf litter and moss on north-facing slopes in deep shade or gulch bottoms. This unit is essential to the conservation of the species because it provides for one population within this multi-island species' historical range on Maui that is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 17—*Diellia erecta*—d

This unit is critical habitat for *Diellia erecta* and is 70 ha (172 ac) on privately owned land. The unit contains Iao Valley. It provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *D. erecta* and is currently occupied by 20 plants. The habitat features contained in this unit that are essential for this species include, but are not limited to, granular soil with leaf litter and moss on north-facing slopes in deep shade or gulch bottoms. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 17—*Diellia erecta*—e

This unit is critical habitat for *Diellia erecta* and is 12 ha (30 ac) on State (Manawainui Plant Sanctuary) land. The unit contains no named natural features. It provides habitat for one population,in combination with Maui 17—*Diellia erecta*—c and Maui 17—*Diellia erecta*—f, of 300 mature, reproducing individuals of the short-lived perennial *D. erecta* and is currently occupied by at least one plant. The habitat features contained in this unit that are essential for this species include, but are not limited to, granular soil with leaf litter and moss on north-facing slopes in deep shade or gulch bottoms. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 17—*Diellia erecta*—f

This unit is critical habitat for *Diellia erecta* and is 14 ha (34 ac) on State-owned land (West Maui Forest Reserve). The unit contains Hanaulaiki. It provides habitat for one population in combination with Maui 17—*Diellia erecta*—c and Maui 17—*Diellia erecta*—e, of 300 mature, reproducing individuals of the short-lived perennial *D. erecta* and is currently occupied by one plant. The habitat features contained in this unit that are essential for this species include, but are not limited to, granular soil with leaf litter and moss on north-facing slopes in deep shade or gulch bottoms. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 8—*Diplazium molokaiense*—a

This unit is critical habitat for *Diplazium molokaiense* and is 575 ha (1,420 ac) on State (Makawao Forest Reserve) and privately owned land. The unit contains Puu o Kakae, Waikamoi, Honomanu, and Piinaau streams. It provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *D. molokaiense* and is currently occupied by at least one plant. The habitat features contained in this unit that are essential for this species include, but are not limited to, land near water courses, often in proximity to waterfalls, in lowland or montane mesic forests. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 9—*Diplazium molokaiense*—b

This unit is critical habitat for *Diplazium molokaiense* and is 162 ha (401 ac) on State-owned land. The unit contains Manawainui Stream. It provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *D. molokaiense* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, land near water courses, often in proximity to waterfalls, in lowland or montane mesic forests. This unit is essential to the conservation of the species because it provides for one population within this multi-island species' historical range on Maui that is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the

island from being destroyed by one naturally occurring catastrophic event.

Maui 17—*Diplazium molokaiense*—c

This unit is critical habitat for *Diplazium molokaiense* and is 1,495 ha (3,693 ac) on State (West Maui Forest Reserve) and privately owned land. The unit contains the Needle Summit, Poohahouhoa and Nakalaloa streams, and Iao Valley). It provides habitat for three populations of 300 mature, reproducing individuals of the short-lived perennial *D. molokaiense* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, land near water courses, often in proximity to waterfalls, in lowland or montane mesic forests. This unit is essential to the conservation of the species because it provides for three populations within this multi-island species' historical range on Maui that is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 17—*Dubautia plantaginea* ssp. *humilis*—a

This unit is critical habitat for *Dubautia plantaginea* ssp. *humilis* and is 293 ha (723 ac) on State (West Maui Forest Reserve) and privately owned land. The unit contains Kauaula Valley and Stream and Niupoko. It provides habitat for three populations of 300 mature, reproducing individuals of the short-lived perennial *D. plantaginea* ssp. *humilis* and is currently unoccupied. This unit is essential to the conservation of the species because it supports habitat that is necessary to the establishment of additional populations on Maui in order to reach recovery goals. The habitat features contained in this unit that are essential for this species include, but are not limited to, wet, barren, steep, rocky, wind-blown cliffs. Although we do not believe that there is enough habitat that currently exists to reach the recovery goal of 8 to 10 populations for this island-endemic species this unit is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species from being destroyed by one naturally occurring catastrophic event.

Maui 17—*Dubautia plantaginea* ssp. *humilis*—b

This unit is critical habitat for *Dubautia plantaginea* ssp. *humilis* and is 114 ha (283 ac) on State (West Maui Forest Reserve) and privately owned land. The unit contains Lihau Summit and Olowalu Valley. It provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *D. plantaginea* ssp. *humilis* and is currently unoccupied. This unit is essential to the conservation of the species because it supports habitat that is necessary to the establishment of additional populations on Maui in order to reach recovery goals. The habitat features contained in this unit that are essential for this species include, but are not limited to, wet, barren, steep, rocky, wind-blown cliffs. Although we do not believe that there is enough habitat that currently exists to reach the recovery goal of 8 to 10 populations for this island-endemic species, this unit is some distance away from the other critical habitat for this species in order to avoid all populations important for the conservation of the species from being destroyed by one naturally occurring catastrophic event.

Maui 17—*Dubautia plantaginea* ssp. *humilis*—c

This unit is critical habitat for *Dubautia plantaginea* ssp. *humilis* and is 95 ha (234 ac) on State (West Maui Forest Reserve) and privately owned land. The unit contains Iao Valley and Needle and Au Stream. It provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *D. plantaginea* ssp. *humilis* and is currently occupied by 65 plants. The habitat features contained in this unit that are essential for this species include, but are not limited to, wet, barren, steep, rocky, wind-blown cliffs. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. Although we do not believe that there is enough habitat that currently exists to reach the recovery goal of 8 to 10 populations for this island-endemic species, this unit some distance away from the other critical habitat for this species in order to avoid all populations important for the conservation of the species from being destroyed by one naturally occurring catastrophic event.

Maui 9—*Flueggea neowawraea*—a

This unit is critical habitat for *Flueggea neowawraea* and is 52 ha (128 ac) on State-owned land (Department of Hawaiian Home Lands (DHHL)). The unit contains Lualailua Hills. It provides habitat for one population in combination with Ulupalakua Ranch of 100 mature, reproducing individuals of the long-lived perennial *F. neowawraea* and is currently occupied by 4 plants. The habitat features contained in this unit that are essential for this species include, but are not limited to, dry or mesic forest. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 13—*Flueggea neowawraea*—b

This unit is critical habitat for *Flueggea neowawraea* and is 50 ha (124 ac) on State-owned land. The unit contains land west of Auwahi Gulch and south of Puu Ouli. In combination with Ulupalakua Ranch and Maui 9—*Flueggea neowawraea*—a, it provides habitat for one population of 100 mature, reproducing individuals of the long-lived perennial *F. neowawraea* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, dry or mesic forest. This unit is essential to the conservation of the species because it provides for one population within this multi-island species' historical range on Maui that is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 9—*Geranium arboreum*—a

This unit is critical habitat for *Geranium arboreum* and is 731 ha (1,806 ac) on State (Kula Forest Reserve) land. The unit contains Polipoli Summit. It provides habitat for 4 populations of 100 mature, reproducing individuals of the long-lived perennial *G. arboreum* and is currently occupied by 12 plants. The habitat features contained in this unit that are essential for this species include, but are not limited to, steep, damp, and shaded narrow canyons and gulches, steep banks, and intermittent streams. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. Although we do not feel that there is enough habitat that currently exists to reach the recovery goal of 8 to 10 populations for this island-endemic species, the units are of an appropriate

distance apart to avoid their destruction by one naturally occurring catastrophic event.

Maui 14—*Geranium arboreum*—b

This unit is critical habitat for *Geranium arboreum* and is 452 ha (1,115 ac) on State (Kula Forest Reserve) and privately owned land. The unit contains Waiohuli Gulch. It provides habitat for one population of 100 mature, reproducing individuals of the long-lived perennial *G. arboreum* and is currently occupied by 22 plants. The habitat features contained in this unit that are essential for this species include, but are not limited to, steep, damp, and shaded narrow canyons and gulches, steep banks, and intermittent streams. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 15—*Geranium arboreum*—c

This unit is critical habitat for *Geranium arboreum* and is 667 ha (1,648 ac) on State (Kula Forest Reserve) and privately owned land. The unit contains land from Waiakoa to Kamehamenui. It provides habitat for two populations of 100 mature, reproducing individuals of the long-lived perennial *G. arboreum* and is currently occupied by two plants. The habitat features contained in this unit that are essential for this species include, but are not limited to, steep, damp, and shaded narrow canyons and gulches, steep banks, and intermittent streams. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. Although we do not feel that there is enough habitat that currently exists to reach the recovery goal of 8 to 10 populations for this island-endemic species, the units are of an appropriate distance apart to avoid their destruction by one naturally occurring catastrophic event.

Maui 8—*Geranium multiflorum*—a

This unit is critical habitat for *Geranium multiflorum* and is 46 ha (113 ac) on privately owned land. The unit contains Honomanu and Piihaau streams. It provides habitat for one population in combination with Waikamoi Preserve of 100 mature, reproducing individuals of the long-lived perennial *G. multiflorum* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, wet or mesic *Metrosideros polymorpha* montane forest or alpine mesic forest, *Leptecophylla tameiameiae* shrubland, *Sophora chrysophylla* subalpine dry forest, open sedge swamps, fog-swept lava flows, or montane grasslands. This unit is essential to the conservation of the species because it provides for one population within this multi-island species' historical range on Maui that is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 9—*Geranium multiflorum*—b

This unit is critical habitat for *Geranium multiflorum* and is 4,817 ha (11,902 ac) on State (Koolau Forest Reserve), Federal (Haleakala National Park), and privately owned land. The unit contains Anapanapa Lake, Halalii Summit, Haleakala Crater, Hanakauhi Summit, Hina, Mauna Summit, Honokahua Summit, Ka Moa o Pele Summit, Kalapawili Ridge, Kalua Awa Summit, Kaluaiki Crater, Kaluanui Crater, Koolau Gap, Kuiki Summit, Laie Cave, Laie Puu Summit, Lauulu Summit, Namana o ke Akua Summit, Oili Puu Summit, Pohaku Palaha Summit, Puu Alaea Summit, Puu Kauaua Summit, Puu Kumu Summit, Puu Maile Summit, Puu Mamane Summit, Puu Naue Summit, Puu Nole Summit, and Waikekeehia. It provides habitat for 6 populations of 100 mature, reproducing individuals of the long-lived perennial *G. multiflorum* and is currently occupied by 122 plants. The habitat features contained in this unit that are essential for this species include, but are not limited to, wet or mesic *Metrosideros polymorpha* montane forest or alpine mesic forest, *Leptecophylla tameiameiae* shrubland, *Sophora chrysophylla* subalpine dry forest, open sedge swamps, fog-swept lava flows, or montane grasslands. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the establishment of additional populations. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 9—*Geranium multiflorum*—c

This unit is critical habitat for *Geranium multiflorum* and is 183 ha (450 ac) on State-owned land. The unit contains Manawainui Gulch. It provides habitat for one population of 100 mature, reproducing individuals of the long-lived perennial *G. multiflorum* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, wet or mesic *Metrosideros polymorpha* montane forest or alpine mesic forest, *Leptecophylla tameiameiae* shrubland, *Sophora chrysophylla* subalpine dry forest, open sedge swamps, fog-swept lava flows, or montane grasslands. This unit is essential to the conservation of the species because it provides for one population within this multi-island species' historical range on Maui that is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 17—*Gouania vitifolia*—a

This unit is critical habitat for *Gouania vitifolia* and is 486 ha (1,198 ac) on State (Panaewa Section of the West Maui NAR) and privately owned land. The unit contains Paupau Summit and Halona and Kanaka streams. It provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *G. vitifolia* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, the sides of ridges and gulches in dry to mesic forests. This unit is essential to the conservation of the species because it provides for one population within this multi-island species' historical range on Maui that is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 17—*Hedyotis coriacea*—a

This unit is critical habitat for *Hedyotis coriacea* and is 106 ha (262 ac) on State (Lihau Section of the West Maui NAR) and privately owned land. The unit contains Olowalu Valley. It provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *H. coriacea* and is currently occupied by one plant. The habitat features contained in this unit that are essential for this species include, but are not limited to, steep,

rocky slopes in dry lowland *Dodonaea viscosa*-dominated shrublands. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 17—*Hedyotis coriacea*—b

This unit is critical habitat for *Hedyotis coriacea* and is 138 ha (340 ac) on State-owned land (West Maui Forest Reserve). The unit contains Ukumehame Valley. It provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *H. coriacea* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, steep, rocky slopes in dry lowland *Dodonaea viscosa*-dominated shrublands. This unit is essential to the conservation of the species because it provides for one population within this multi-island species' historical range on Maui that is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 17—*Hedyotis mannii*—a

This unit is critical habitat for *Hedyotis mannii* and is 2,234 ha (5,521 ac) on State (Panaewa Section of the West Maui NAR) and privately owned land. The unit contains the Needle Summit, Poohahouhoa Stream, Nakalaloa Stream, Iao Valley, Kauaula, Makila Stream, and Kanaha Stream. It provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *H. mannii* and is currently occupied by fewer than 10 plants. The habitat features contained in this unit that are essential for this species include, but are not limited to, basalt cliffs along stream banks in *Metrosideros polymorpha-Dicranopteris* linearis montane wet forest. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 17—*Hesperomannia arbuscula*—a

This unit is critical habitat for *Hesperomannia arbuscula* and is 392 ha (968 ac) on State (Panaewa Section of the West Maui NAR) and privately owned land. The unit contains Panaewa Valley and Halona and Kanaha streams. It provides habitat for two populations of 100 mature, reproducing individuals of the long-lived perennial *H. arbuscula* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, steep forested slopes and ridges in mesic forest dominated by *Metrosideros polymorpha* or *Diospyros sandwicensis.* This is essential to the conservation of the species because it unit provides for two populations within this multi-island species' historical range on Maui that are some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 17—*Hesperomannia arbuscula*—b

This unit is critical habitat for *Hesperomannia arbuscula* and is 436 ha (1,076 ac) on privately owned land. The unit contains Iao Valley and Needle, and Poohahaonao, Nakalaloa, and Kinihapai streams. It provides habitat for 3 populations of 100 mature, reproducing individuals of the long-lived perennial *H. arbuscula* and is currently occupied by 10 plants. The habitat features contained in this unit that are essential for this species include, but are not limited to, steep forested slopes and ridges in mesic forest dominated by *Metrosideros polymorpha* or *Diospyros sandwicensis.* This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 16—*Hibiscus brackenridgei*—a

This unit is critical habitat for *Hibiscus brackenridgei* and is 212 ha (524 ac) on privately owned land. The unit contains Paleaanu and Kaonohoa gulches and Kaunoahua Ridge. It provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *H. brackenridgei* and is currently occupied by 8 plants. The habitat features contained in this unit that are essential for this species include, but are not limited to, lowland dry forest, sometimes with *Erythrina sandwicensis* as the dominant tree. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 17—*Hibiscus brackenridgei*—b

This unit is critical habitat for *Hibiscus brackenridgei* and is 667 ha (1,645 ac) on State (Lihau Section of the West Maui NAR, West Maui Forest Reserve) and privately owned land. The unit contains Olowalu Valley, Olowalu Stream, and Ukumehame. It provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *H. brackenridgei* and is currently occupied by 14 plants. The habitat features contained in this unit that are essential for this species include, but are not limited to, lowland dry forest, sometimes with *Erythrina sandwicensis* as the dominant tree. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 6—*Ischaemum byrone*—a

This unit is critical habitat for *Ischaemum byrone* and is 18 ha (42 ac) on State and privately owned land. The unit contains Kopiliula Stream, Kapaula Gulch, Waiaaka Stream, Waiohue Bay and Paakea Gulch. It provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *I. byrone* and is currently occupied by fewer than 10 plants. The habitat features contained in this unit that are essential for this species include, but are not limited to, close proximity to the ocean, among rocks or on basalt cliffs in windward coastal dry shrubland. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the

expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 7—*Ischaemum byrone*—b

This unit is critical habitat for *Ischaemum byrone* and is 11 ha (27 ac) on State-owned land (Waianapanapa State Park). The unit contains Pailoa and Keawaiki Bays, and Pukaulaa Point. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *I. byrone* and is currently occupied by 50 to 100 plants. The habitat features contained in this unit that are essential for this species include, but are not limited to, close proximity to the ocean, among rocks or on basalt cliffs in windward coastal dry shrubland. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the speciess on the island from being destroyed by one naturally occurring catastrophic event.

Maui 17—*Isodendrion pyrifolium*—a

This unit is critical habitat for *Isodendrion pyrifolium* and is 224 ha (555 ac) on State (Lihau Section of the West Maui NAR, West Maui Forest Reserve) and privately owned land. The unit contains Olowalu Valley, Olowalu Stream, and Ukumehame. It provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *I. pyrifolium* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, close proximity to the ocean, among rocks or on basalt cliffs in windward coastal dry shrubland. This unit is essential to the conservation of the species because it provides for two populations within this multi-island species' historical range on Maui that are some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 9—*Lipochaeta kamolensis—a*

This unit is critical habitat for *Lipochaeta kamolensis* and is 1,474 ha (3,644 ac) on State and privately owned land. The unit contains Lualailua Hills and Manawainui, Kamole, and Palaha gulches. It provides habitat for 4 populations of 300 mature, reproducing individuals of the short-lived perennial *L. kamolensis* and is currently occupied by 100 to 200 plants. The habitat features contained in this unit that are essential for this species include, but are not limited to, gulches or gentle slopes outside gulches in dry shrubland. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. Although we do not believe that there is enough habitat that currently exists to reach the recovery goal of 8 to 10 populations for this island-endemic species, the units are of an appropriate distance apart to avoid their destruction by one naturally occurring catastrophic event.

Maui 11—*Lipochaeta kamolensis*—b

This unit is critical habitat for *Lipochaeta kamolensis* and is 42 ha (105 ac) on State-owned land. The unit contains Pahihi Gulch. It, in combination with Haleakala Ranch lands, provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *L. kamolensis* and is currently unoccupied. This unit is essential to the conservation of the species because it supports habitat that is necessary to the establishment of additional populations on Maui in order to reach recovery goals. The habitat features contained in this unit that are essential for this species include, but are not limited to, gulches or gentle slopes outside gulches in dry shrubland. Although we do not believe that there is enough habitat that currently exists to reach the recovery goal of 8 to 10 populations for this island-endemic species, this unit is some distance away from the other critical habitat for this species in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophic event.

Maui 17—*Lysimachia lydgatei*—a

This unit is critical habitat for *Lysimachia lydgatei* and is 90 ha (221 ac) on State (Lihau Section of the West Maui NAR, West Maui Forest Reserve) and privately owned land. The unit contains Lihau Summit and Olowalu Valley. It provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *L. lydgatei* and is currently occupied by 50 to 100 plants. The habitat features contained in this unit that are essential for this species include, but are not limited to, sides of steep ridges in *Metrosideros polymorpha-Dicranopteris linearis*-dominated wet to mesic shrubland or *M. polymorpha-Cheirodendron* sp. montane forest. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 17—*Lysimachia lydgatei*—b

This unit is critical habitat for *Lysimachia lydgatei* and is 158 ha (391 ac) on State (West Maui Forest Reserve) and privately owned land. The unit contains Pohakea Gulch and Hanaula Summit. It, in combination with Haleakala Ranch lands, provides habitat for 4 populations of 300 mature, reproducing individuals of the short-lived perennial *L. lydgatei* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, sides of steep ridges in *Metrosideros polymorpha-Dicranopteris linearis*-dominated wet to mesic shrubland or *M. polymorpha-Cheirodendron* sp. montane forest. This unit is essential to the conservation of the species because, in combination with Haleakala Ranch, it provides for four populations within this multi-island species' historical range on Maui that are some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 17—*Lysimachia lydgatei*—c

This unit is critical habitat for *Lysimachia lydgatei* and is 47 ha (116 ac) on State (Panaewa Section of the West Maui NAR) and privately owned land. The unit contains no named natural features. It, in combination with Haleakala Ranch Lands, provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *L. lydgatei* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, sides of steep ridges in *Metrosideros polymorpha-Dicranopteris linearis*-dominated wet to mesic shrubland or *M. polymorpha-Cheirodendron* sp. montane forest. This unit is essential to the conservation of the species because, in combination with Haleakala Ranch, it provides for

one population within this multi-island species' historical range on Maui that is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 17—*Lysimachia lydgatei*—d

This unit is critical habitat for *Lysimachia lydgatei* and is 98 ha (242 ac) on State (West Maui Forest Reserve) and privately owned land. The unit contains Helu Summit. It provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *L. lydgatei* and is currently occupied by 40 plants. The habitat features contained in this unit that are essential for this species include, but are not limited to, sides of steep ridges in *Metrosideros polymorpha-Dicranopteris linearis*-dominated wet to mesic shrubland or *M. polymorpha-Cheirodendron* sp. montane forest. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 17—*Lysimachia lydgatei*—e

This unit is critical habitat for *Lysimachia lydgatei* and is 18 ha (44 ac) on State-owned land (West Maui Forest Reserve). The unit contains Halepohaku Summit. It provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *L. lydgatei* and is currently occupied by 50 to 100 plants. The habitat features contained in this unit that are essential for this species include, but are not limited to, sides of steep ridges in *Metrosideros polymorpha-Dicranopteris linearis*-dominated wet to mesic shrubland or *M. polymorpha-Cheirodendron* sp. montane forest. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 6—*Mariscus pennatiformis*—a

This unit is critical habitat for *Mariscus pennatiformis* and is 30 ha (74 ac) on State and privately owned land. The unit contains Pahiha Point, Kopiliula Stream, Paakea Gulch, Waiohue Bay, Waiaaka Stream, Kapaula Gulch, and Hanawi Stream. It provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *M. pennatiformis* and is currently occupied by two plants. The habitat features contained in this unit that are essential for this species include, but are not limited to, cliffs with brown soil and talus within reach of ocean spray. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 13—*Melicope adscendens*—a

This unit is critical habitat for *Melicope adscendens* and is 160 ha (398 ac) on State (Kanaio NAR) land. The unit contains no named natural features. It, in combination with Ulupalakua Ranch land, provides habitat for one population of 100 mature, reproducing individuals of the long-lived perennial *M. adscendens* and is currently occupied by one plant. The habitat features contained in this unit that are essential for this species include, but are not limited to, aa lava with pockets of soil in *Nestegis sandwicensis-Pleomele auwahiensis-Dodonaea viscosa* lowland mesic forest or open dry forest. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. Although we do not believe that there is enough habitat designated to reach the recovery goal of 8 to 10 populations, this species is a very narrow endemic and probably never naturally occurred in more than a single or a few populations.

Maui 8—*Melicope balloui*—a

This unit is critical habitat for *Melicope balloui* and is 151 ha (373 ac) on State (Makawao Forest Reserve) and privately owned land. The unit contains Puu o Kakae. It, in combination with Waikamoi Preserve land, provides habitat for one population of 100 mature, reproducing individuals of the long-lived perennial *M. balloui* and is currently occupied by one plant. The habitat features contained in this unit that are essential for this species include, but are not limited to, mesic to wet forest. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. Although we do not believe that there is enough habitat that currently exists to reach the recovery goal of 8 to 10 populations for this island-endemic species, this unit is of an appropriate size so that each potential population within the unit is geographically separated enough to avoid their destruction by one naturally occurring catastrophic event.

Maui 9—*Melicope balloui*—b

This unit is critical habitat for *Melicope balloui* and is 394 ha (972 ac) on federally owned land (Haleakala National Park). The unit contains Kipahulu Valley and Palikea Stream. It provides habitat for two populations of 100 mature, reproducing individuals of the long-lived perennial *M. balloui* and is currently occupied by 10 to 50 plants. The habitat features contained in this unit that are essential for this species include, but are not limited to, mesic to wet forest. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. Although we do not believe that there is enough habitat that currently exists to reach the recovery goal of 8 to 10 populations for this island-endemic species, this unit is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species from being destroyed by one naturally occurring catastrophic event.

Maui 9—*Melicope knudsenii*—a

This unit is critical habitat for *Melicope knudsenii* and is 28 ha (69 ac) on State-owned land (Kanaio NAR). The unit contains no named natural features. It, in combination with Ulupalakua Ranch land, provides habitat for one population of 100 mature, reproducing individuals of the long-lived perennial *M. knudsenii* and is currently occupied by 12 plants. The habitat features contained in this unit that are essential for this species include, but are not limited to, forested flats or talus slopes in *Nestegis sandwicensis-Pleomele* sp. mixed open dry forests. This unit is essential to the conservation of the species because it supports an extant

colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 13—*Melicope knudsenii*—b

This unit is critical habitat for *Melicope knudsenii* and is 163 ha (403 ac) on State-owned land. The unit contains no named natural features. This unit is essential to the conservation of the species because, in combination with Ulupalakua Ranch, it provides habitat for one population of 100 mature, reproducing individuals of the long-lived perennial *M. knudsenii* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, forested flats or talus slopes in *Nestegis sandwicensis-Pleomele* sp. mixed open dry forests. This unit, in combination with Ulupalakua Ranch, provides for one population within this multi-island species' historical range on Maui that is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 9—*Melicope mucronulata*—a

This unit is critical habitat for *Melicope mucronulata* and is 34 ha (83 ac) on State-owned land (Kanaio NAR). The unit contains no named natural features. It, in combination with Ulupalakua Ranch, provides habitat for one population of 100 mature, reproducing individuals of the long-lived perennial *M. mucronulata* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, gentle south-facing slopes in lowland dry to mesic forest. This unit is essential to the conservation of the species because, in combination with Haleakala Ranch, it provides for one population within this multi-island species' historical range on Maui that is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 13—*Melicope mucronulata*—b

This unit is critical habitat for *Melicope mucronulata* and is 194 ha (481 ac) on State-owned land. The unit contains no named natural features. It, in combination with Ulupalakua Ranch, provides habitat for one population of 100 mature, reproducing individuals of the long-lived perennial *M. mucronulata* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, gentle south-facing slopes in lowland dry to mesic forest. This unit is essential to the conservation of the species because, in combination with Ulupalakua Ranch, it provides for one population within this multi-island species' historical range on Maui that is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 9—*Melicope ovalis*—a

This unit is critical habitat for *Melicope ovalis* and is 934 ha (2,306 ac) on State and Federal (Haleakala National Park) land. The unit contains Kipahulu Valley, Palikea Stream, and Kaukaui Gulch. It provides habitat for 3 populations of 100 mature, reproducing individuals of the long-lived perennial *M. ovalis* and is currently occupied by 250 plants. The habitat features contained in this unit that are essential for this species include, but are not limited to, *Acacia koa* and *Metrosideros polymorpha*-dominated montane wet forests along streams. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. Although we do not believe that there is enough habitat that currently exists to reach the recovery goal of 8 to 10 populations for this island-endemic species, this unit is of an appropriate size so that each potential populations important for the conservation of the specie within the unit is geographically separated enough to avoid their destruction by one naturally occurring catastrophic event.

Maui 9—*Neraudia sericea*—a

This unit is critical habitat for *Neraudia sericea* and is 623 ha (1,539 ac) on State-owned land. The unit contains Manawainui Gulch, Kamole Gulch and Puu Pane. It provides habitat for 3 populations of 300 mature, reproducing individuals of the short-lived perennial *N. sericea* and is currently occupied by 4 plants. The habitat features contained in this unit that are essential for this species include, but are not limited to, dry to mesic *Metrosideros polymorpha-Dodonaea viscosa-Leptecophylla tameiameiae* shrubland or forest or *Acacia koa* forest. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 17—*Neraudia sericea*—b

This unit is critical habitat for *Neraudia sericea* and is 1,188 ha (2,938 ac) on State (Lihau Section of the West Maui NAR, West Maui Forest Reserve) and privately owned land. The unit contains Olowalu Valley, Pohakea, and Lihau, Hokuula, and Halepohaku summits. It provides habitat for 4 populations of 300 mature, reproducing individuals of the short-lived perennial *N. sericea* and is currently occupied by one plant. The habitat features contained in this unit that are essential for this species include, but are not limited to, dry to mesic *Metrosideros polymorpha-Dodonaea viscosa-Leptecophylla tameiameiae* shrubland or forest or *Acacia koa* forest. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all recovery populations on the island from being destroyed by one naturally occurring catastrophic event.

Maui 9—Nototrichium Humile—a

This unit is critical habitat for *Nototrichium humile* and is 397 ha (982 ac) on State (DHHL) and privately owned land. The unit contains Lualailua Hills. It provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *N. humile* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, old cinder cones in dry shrubland. This unit is essential to the conservation of the species because it provides for two populations within this multi-island species' historical range on Maui that are some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being

destroyed by one naturally occurring catastrophic event.

Maui 4—*Peucedanum sandwicense*—a

This unit is critical habitat for *Peucedanum sandwicense* and is 1 ha (2 ac) on State-owned land. The unit contains all of Keopuka Rock. It provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *P. sandwicense* and is currently occupied by 20 to 30 plants. The habitat features contained in this unit that are essential for this species include, but are not limited to, sparsely vegetated steep to vertical cliff habitats with little soil in mesic or coastal communities. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 17—*Peucedanum sandwicense*—b

This unit is critical habitat for *Peucedanum sandwicense* and is 117 ha (289 ac) on privately owned land. The unit contains Iao Valley. It provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *P. sandwicense* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, sparsely vegetated steep to vertical cliff habitats with little soil in mesic or coastal communities. This unit is essential to the conservation of the species because it provides for one population within this multi-island species' historical range on Maui that is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 8—*Phlegmariurus mannii*—a

This unit is critical habitat for *Phlegmariurus mannii* and is 221 ha (548 ac) on State (Makawao Forest Reserve) and privately owned land. The unit contains Puu o Kakae and Opana Gulch. It, in combination with Waikamoi Preserve, provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *P. mannii* and is currently occupied by at least one plant. The habitat features contained in this unit that are essential for this species include, but are not limited to, epiphytic growth on *Metrosideros polymorpha, Dodonaea viscosa,* or *Acacia koa* trees in moist protected gulches or mossy tussocks in mesic to wet montane *M. polymorpha-Acacia koa* forests. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 9—*Phlegmariurus mannii*—b

This unit is critical habitat for *Phlegmariurus mannii* and is 383 ha (947 ac) on State-owned land. The unit contains Manawainui Gulch. It provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *P. mannii* and is currently occupied by at least one plant. The habitat features contained in this unit that are essential for this species include, but are not limited to, epiphytic growth on *Metrosideros polymorpha, Dodonaea viscosa,* or *Acacia koa* trees in moist protected gulches or mossy tussocks in mesic to wet montane *M. polymorpha-Acacia koa* forests. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 9—*Phlegmariurus mannii*—c

This unit is critical habitat for *Phlegmariurus mannii* and is 476 ha (1,176 ac) on State (Kipahulu Forest Reserve) and federally owned land (Haleakala National Park). The unit contains Puu Anulili and Manawainui Gulch. It provides habitat for 3 populations of 300 mature, reproducing individuals of the short-lived perennial *P. mannii* and is currently occupied by two plants. The habitat features contained in this unit that are essential for this species include, but are not limited to, epiphytic growth on *Metrosideros polymorpha, Dodonaea viscosa,* or *Acacia koa* trees in moist protected gulches or mossy tussocks in mesic to wet montane *M. polymorpha-Acacia koa* forests. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 17—*Phlegmariurus mannii*—d

This unit is critical habitat for *Phlegmariurus mannii* and is 57 ha (141 ac) on Dtate (Honokowai Section of the West Maui NAR) and privately owned land. The unit contains Amahu and Kanaha streams. It provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *P. mannii* and is currently occupied by at least one plant. The habitat features contained in this unit that are essential for this species include, but are not limited to, epiphytic growth on *Metrosideros polymorpha, Dodonaea viscosa,* or *Acacia koa* trees in moist protected gulches or mossy tussocks in mesic to wet montane *M. polymorpha-Acacia koa* forests. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 17—*Phlegmariurus mannii*—e

This unit is critical habitat for *Phlegmariurus mannii* and is 35 ha (87 ac) on State (Lihau Section of the West Maui NAR and West Maui Forest Reserve) and privately owned land. The unit contains Lihau Summit. It provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *P. mannii* and is currently occupied by at least one plant. The habitat features contained in this unit that are essential for this species include, but are not limited to, epiphytic growth on *Metrosideros polymorpha, Dodonaea viscosa,* or *Acacia koa* trees in moist protected gulches or mossy tussocks in mesic to wet montane *M. polymorpha-Acacia koa* forests. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present

population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 8—*Phyllostegia mannii*—a

This unit is critical habitat for *Phyllostegia mannii* and is 570 ha (1,408 ac) on State (Makawao Forest Reserve) and privately owned land. The unit contains Opana Gulch and Waikamoi, Honomanu, Haipuaena, and Puohakamau streams. It provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *P. mannii* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, gentle slopes and the steep sides of gulches in mesic to wet forest dominated by *Acacia koa* and/or *Metrosideros polymorpha.* This unit is essential to the conservation of the species because it provides for two populations within this multi-island species' historical range on Maui that are some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 8—*Phyllostegia mollis*—a

This unit is critical habitat for *Phyllostegia mollis* and is 128 ha (316 ac) on State-owned land (Makawao Forest Reserve). The unit contains Opana Gulch. It provides habitat for one population in combination with Haleakala Ranch land of 300 mature, reproducing individuals of the short-lived perennial *P. mollis* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, steep slopes and gulches in mesic forest dominated by *Metrosideros polymorpha* and/or *Acacia koa.* This unit is essential to the conservation of the species because it provides for one population within this multi-island species' historical range on Maui that is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 9—*Phyllostegia mollis*—b

This unit is critical habitat for *Phyllostegia mollis* and is 509 ha (1,256 ac) on State-owned land. The unit contains Puu Pane. It provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *P. mollis* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, steep slopes and gulches in mesic forest dominated by *Metrosideros polymorpha* and/or *Acacia koa.* This unit is essential to the conservation of the species because it provides for two populations within this multi-island species' historical range on Maui that are some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 9—*Plantago princeps*—a

This unit is critical habitat for *Plantago princeps* and is 164 ha (406 ac) on federally owned land (Haleakala National Park). The unit contains Haleakala Summit and Kaopo Gap. It provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *P. princeps* and is currently occupied by 44 plants. The habitat features contained in this unit that are essential for this species include, but are not limited to, basalt cliffs that are windblown with little vegetation in *Metrosideros polymorpha* lowland wet forest, *Acacia koa-M. polymorpha* montane wet forest, or *M. polymorpha* montane wet shrubland. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 17—*Plantago princeps*—b

This unit is critical habitat for *Plantago princeps* and is 327 ha (807 ac) on State (West Maui Forest Reserve) and privately owned land. The unit contains Iao Valley and Kahoolewa Ridge. It provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *P. princeps* and is currently occupied by 51 plants. The habitat features contained in this unit that are essential for this species include, but are not limited to, basalt cliffs that are windblown with little vegetation in *Metrosideros polymorpha* lowland wet forest, *Acacia koa-M. polymorpha* montane wet forest, or *M. polymorpha* montane wet shrubland. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 9—*Platanthera holochila*—a

This unit is critical habitat for *Platanthera holochila* and is 240 ha (596 ac) on State (Hana Forest Reserve) and federally owned land (Haleakala National Park). The unit contains Anapanapa Lake and Kalapawili Ridge. It provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *P. holochila* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, *Metrosideros polymorpha-Dicranopteris linearis* montane wet forest, *M. polymorpha* mixed montane bog, or mesic scrubby *M. polymorpha* forest. This unit is essential to the conservation of the species because it provides for one population within this multi-island species' historical range on Maui that is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 17—*Platanthera holochila*—b

This unit is critical habitat for *Platanthera holochila* and is 8 ha (19 ac) on State (West Maui Forest Reserve) and privately owned land. The unit contains no named natural features. It, in combination with Maui 17–*Platanthera holochila*—c, provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *P. holochila* and is currently occupied by two plants. The habitat features contained in this unit that are essential for this species include, but are not limited to, *Metrosideros polymorpha-Dicranopteris linearis* montane wet forest, *M. polymorpha* mixed montane bog, or mesic scrubby *M. polymorpha* forest. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the

conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 17—*Platanthera holochila*—c

This unit is critical habitat for *Platanthera holochila* and is 189 ha (466 ac) on State (Honokowai Section of the West Maui NAR) and privately owned land. The unit contains Kapaloa and Amala streams. It, in combination with Maui 17–*Platanthera holochila*—b, provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *P. holochila* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, *Metrosideros polymorpha-Dicranopteris linearis* montane wet forest, *M. polymorpha* mixed montane bog, or mesic scrubby *M. polymorpha* forest. This unit, in combination with Maui 17–*Platanthera holochila*—b, is essential to the conservation of the species because it provides for one population within this multi-island species' historical range on Maui that is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 17—*Pteris lidgatei*—a

This unit is critical habitat for *Pteris lidgatei* and is 1,168 ha (2,887 ac) on State (Kahakuloa Section of the West Maui NAR) and privately owned land. The unit contains Eke Crater, Keahikauo Summit, and Mananole Stream. It provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *P. lidgatei* and is currently occupied by at least one plant. The habitat features contained in this unit that are essential for this species include, but are not limited to, steep stream banks in wet *Metrosideros polymorpha-Dicranopteris linearis* montane forest. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 17—*Pteris lidgatei*—b

This unit is critical habitat for *Pteris lidgatei* and is 163 ha (403 ac) on privately owned land. The unit contains Kauaula Valley. It provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *P. lidgatei* and is currently occupied by at least one plant. The habitat features contained in this unit that are essential for this species include, but are not limited to, steep stream banks in wet *Metrosideros polymorpha-Dicranopteris linearis* montane forest. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 17—*Remya mauiensis*—a

This unit is critical habitat for *Remya mauiensis* and is 228 ha (564 ac) on State (West Maui Forest Reserve) and privately owned land. The unit contains Ukumehame Valley and Hanaulaiki. It provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *R. mauiensis* and is currently occupied by two plants. The habitat features contained in this unit that are essential for this species include, but are not limited to, steep, north or northeast-facing slopes in mixed mesophytic forests or *Metrosideros polymorpha* montane wet forests. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. Although we do not believe that there is enough habitat that currently exists to reach the recovery goal of 8 to 10 populations for this island-endemic species, the units are essential because they are an appropriate distance apart to avoid their destruction by one naturally occurring catastrophic event.

Maui 17—*Remya mauiensis*—b

This unit is critical habitat for *Remya mauiensis* and is 567 ha (1,400 ac) on State (West Maui Forest Reserve and Panaewa Section of the West Maui NAR) and privately owned land. The unit contains Wahikuli and Puuiki Gulches and Kula Valley. It provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *R. mauiensis* and is currently occupied by at least one plant. The habitat features contained in this unit that are essential for this species include, but are not limited to, steep, north or northeast-facing slopes in mixed mesophytic forests or *Metrosideros polymorpha* montane wet forests. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. Although we do not believe that there is enough habitat that currently exists to reach the recovery goal of 8 to 10 populations for this island-endemic species, the units are essential because they are an appropriate distance apart to avoid their destruction by one naturally occurring catastrophic event.

Maui 17—*Remya mauiensis*—c

This unit is critical habitat for *Remya mauiensis* and is 31 ha (78 ac) on State (West Maui Forest Reserve and Honokowai Section of the West Maui NAR) and privately owned land. The unit contains Honokowai Valley. It, in combination with Maui 18—*Remya mauiensis*—d and Kapunakea Preserve, provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *R. mauiensis* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, steep, north or northeast-facing slopes in mixed mesophytic forests or *Metrosideros polymorpha* montane wet forests. Although we do not believe that there is enough habitat that currently exists to reach the recovery goal of 8 to 10 populations for this island-endemic species, the units are essential because they are an appropriate distance apart to avoid their destruction by one naturally occurring catastrophic event.

Maui 18—*Remya mauiensis*—d

This unit is critical habitat for *Remya mauiensis* and is 2 ha (6 ac) on State (West Maui Forest Reserve) and privately owned land. The unit contains no named natural features. It, in combination with Maui 17—*Remya mauiensis*—c and Kapunakea Preserve, provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *R. mauiensis* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, steep, north or northeast-facing slopes in mixed mesophytic forests or *Metrosideros polymorpha* montane wet forests. Although we do not believe that there is enough habitat that currently exists to reach the recovery goal of 8 to 10 populations for this island-endemic species, the units are essential because

they are an appropriate distance apart to avoid their destruction by one naturally occurring catastrophic event.

Maui 17—*Sanicula purpurea*—a

This unit is critical habitat for *Sanicula purpurea* and is 34 ha (83 ac) on State (Kahakuloa Section of the West Maui NAR) and privately owned land. The unit contains Eke Crater. It, in combination with Maui 17—*Sanicula purpurea*—c, provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *S. purpurea* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, open *Metrosideros polymorpha* mixed montane bogs. This unit is essential to the conservation of the species because it, in combination with Maui 17—*Sanicula purpurea*—c, provides for one population within this multi-island species' historical range on Maui that is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species from being destroyed by one naturally occurring catastrophic event.

Maui 17—*Sanicula purpurea*—b

This unit is critical habitat for *Sanicula purpurea* and is 306 ha (756 ac) on State (Panaewa and Honokowai Sections of the West Maui NAR) and privately owned land. The unit contains Kahoolewa, Kahoolewa Ridge, Puu Kukui Summit, and Violet Lake. It provides habitat for 3 populations of 300 mature, reproducing individuals of the short-lived perennial *S. purpurea* and is currently occupied by 70 to 150 plants. The habitat features contained in this unit that are essential for this species include, but are not limited to, open *Metrosideros polymorpha* mixed montane bogs. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 17—*Sanicula purpurea*—c

This unit is critical habitat for *Sanicula purpurea* and is 8 ha (19 ac) on privately owned land. The unit contains no named natural features. It, in combination with Maui 17—*Sanicula purpurea*—a, provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *S. purpurea* and is currently occupied by 50 plants. The habitat features contained in this unit that are essential for this species include, but are not limited to, open *Metrosideros polymorpha* mixed montane bogs. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 9—*Schiedea haleakalensis*—a

This unit is critical habitat for *Schiedea haleakalensis* and is 26 ha (64 ac) on federally owned land (Haleakala National Park). The unit is located in Haleakala Crater. It provides habitat for one population of 300 mature, reproducing individuals of the long-lived perennial *S. haleakalensis* and is currently occupied by 20 plants. The habitat features contained in this unit that are essential for this species include, but are not limited to, rock cracks on sheer cliffs adjacent to barren lava; subalpine shrublands and grasslands with cinder, weathered volcanic ash; or bare lava substrate with little or no soil development and periodic freezing temperatures. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. Although we do not believe that there is enough habitat that currently exists to reach the recovery goal of 8 to 10 populations for this island-endemic species, the units are essential because they are an appropriate distance apart to avoid their destruction by one naturally occurring catastrophic event.

Maui 9—*Schiedea haleakalensis*—b

This unit is critical habitat for *Schiedea haleakalensis* and is 77 ha (189 ac) on federally owned land (Haleakala National Park). The unit is located in Haleakala Crater. It provides habitat for one population of 300 mature, reproducing individuals of the long-lived perennial *S. haleakalensis* and is currently occupied by at least one plant. The habitat features contained in this unit that are essential for this species include, but are not limited to, rock cracks on sheer cliffs adjacent to barren lava; subalpine shrublands and grasslands with cinder, weathered volcanic ash; or bare lava substrate with little or no soil development and periodic freezing temperatures. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. Although we do not believe that there is enough habitat that currently exists to reach the recovery goal of 8 to 10 populations for this island-endemic species, the units are essential because they are an appropriate distance apart to avoid their destruction by one naturally occurring catastrophic event.

Maui 1—*Sesbania tomentosa*—a

This unit is critical habitat for *Sesbania tomentosa* and is 38 ha (94 ac) on non-managed State and privately owned land. The unit contains Honanana Gulch, Alapapa Gulch, Mokolea Point, and Papanahoa Gulch. It provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Sesbania tomentosa* and is currently occupied by 30 plants. The habitat features contained in this unit that are essential for this species include, but are not limited to, windswept slopes, sea cliffs, and cinder cones in *Scaevola taccada* coastal dry shrublands. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 13—*Sesbania tomentosa*—b

This unit is critical habitat for *Sesbania tomentosa* and is 79 ha (195 ac) on State-owned land. The unit contains Pimoe and Pohakea summits. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Sesbania tomentosa* and is currently occupied by 13 plants. The habitat features contained in this unit that are essential for this species include, but are not limited to, windswept slopes, sea cliffs, and cinder cones in *Scaevola taccada* coastal dry shrublands. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the

island from being destroyed by one naturally occurring catastrophic event.

Maui 13—*Spermolepis hawaiiensis*—a

This unit is critical habitat for *Spermolepis hawaiiensis* and is 91 ha (224 ac) on State (Kanaio NAR) land. The unit contains no named natural features. It provides habitat for one population of 500 mature, reproducing individuals of the annual *S. hawaiiensis* and is currently occupied by 100 plants. The habitat features contained in this unit that are essential for this species include, but are not limited to, shady spots in *Dodonaea viscosa* lowland dry shrubland. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 17—*Spermolepis hawaiiensis*—b

This unit is critical habitat for *Spermolepis hawaiiensis* and is 23 ha (56 ac) on State-owned land (Lihau Section of the West Maui NAR). The unit contains Olowalu Valley. It provides habitat for one population of 500 mature, reproducing individuals of the annual *S. hawaiiensis* and is currently occupied by 300 plants. The habitat features contained in this unit that are essential for this species include, but are not limited to, shady spots in *Dodonaea viscosa* lowland dry shrubland. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 17—*Tetramolopium capillare*—a

This unit is critical habitat for *Tetramolopium capillare* and is 1,782 ha (4,404 ac) on State (Lihau Section of the West Maui NAR, West Maui Forest Reserve) and privately owned land. The unit contains Halepohaku, Hanaulaiki, Helu, Koai, Lihau, Luakoi, and Ulaula summits. It provides habitat for 6 populations of 300 mature, reproducing individuals of the short-lived perennial *T. capillare* and is currently occupied by 50 to 100 plants. The habitat features contained in this unit that are essential for this species include, but are not limited to, rocky substrates in *Heteropogon contortus* lowland dry forest. This unit is essential to the conservation of the species because it supports an extant colony of this species, includes habitat that is important for the expansion of the present population, and is the only habitat essential for the conservation of this species on Maui. Although we do not feel that there is enough habitat that currently exists to reach the recovery goal of 8 to 10 populations for this island-endemic species, this unit is of an appropriate size so that each potential populations important for the conservation of the specie within the unit is geographically separated enough to avoid their destruction by one naturally occurring event.

Maui 17—*Tetramolopium remyi*—a

This unit is critical habitat for *Tetramolopium remyi* and is 287 ha (712 ac) on State (Lihau Section of the West Maui NAR, West Maui Forest Reserve) and privately owned land. The unit contains Olowalu Stream and Valley. It provides habitat for 3 populations of 300 mature, reproducing individuals of the short-lived perennial *T. remyi* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, red sandy loam soil in dry *Dodonaea viscosa-Heteropogon contortus* communities. This unit is essential to the conservation of the species because it provides for three populations within this multi-island species' historical range on Maui that are some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species from being destroyed by one naturally occurring catastrophic event.

Maui 12—*Vigna o-wahuensis*—a

This unit is critical habitat for *Vigna o-wahuensis* and is 144 ha (356 ac) on State-owned land. The unit contains area east of Kamanamana Point. It provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *V. o-wahuensis* and is currently occupied by two plants. The habitat features contained in this unit that are essential for this species include, but are not limited to, dry or mesic grassland or shrubland. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Maui 8—*Zanthoxylum hawaiiense*—a

This unit is critical habitat for *Zanthoxylum hawaiiense* and is 363 ha (895 ac) on State (Makawao Forest Reserve) and privately owned land. The unit contains Kahakapao Stream. It provides habitat for one population of 100 mature, reproducing individuals of the long-lived perennial *Z. hawaiiense* and is currently occupied by 3 plants. The habitat features contained in this unit that are essential for this species include, but are not limited to, open lowland dry or mesic *Nestegis sandwicensis-Pleomele auwahiensis* forests or *Acacia koa-Pleomele auwahiensis* forest, or montane dry forest. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It is some distance away from the other critical habitat for this species, in order to avoid all populations important for the conservation of the species on the island from being destroyed by one naturally occurring catastrophic event.

Kahoolawe 1—*Kanaloa kahoolawensis*—a

This unit is critical habitat for *Kanaloa kahoolawensis* and is 562 ha (1,388 ac) on State (KIRC) land. The unit contains Keana Keiki, Laa o Kealaikahiki, Honukanaenae, and Wai Honu Gulch. This unit provides habitat for two populations of 100 mature, reproducing individuals of the long-lived perennial *K. kahoolawensis* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, steep, rocky talus slopes. Although we do not believe that there is enough habitat that currently exists to reach the recovery goal of 8 to 10 populations for this island-endemic species, the units are essential because they are an appropriate distance apart to avoid their destruction by one naturally occurring catastrophic event.

Kahoolawe 2—*Kanaloa kahoolawensis*—b

This unit is critical habitat for *Kanaloa kahoolawensis* and is 613 ha (1,515 ac) on State (KIRC) land. The unit contains Aleale, Kunaka Cave, Kamohio Bay, Iliililoa, Lae o Kuakaiwa, Lae O Kaka, Lae o Halona, Keoheuli Bay,

Kaukamaka Gulch, Pali o Kalapakea, Kalua o Kamohoalii, Hula Kao, and Lae o ka Ule. This unit provides habitat for 4 populations of 100 mature, reproducing individuals of the long-lived perennial *K. kahoolawensis* and is currently occupied by two plants. The habitat features contained in this unit that are essential for this species include, but are not limited to, steep, rocky talus slopes. This unit is essential to the conservation of the species because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. Although we do not feel that there is enough habitat that currently exists to reach the recovery goal of 8 to 10 populations for this island-endemic species, the units are of an appropriate distance apart to avoid their destruction by one naturally occurring catastrophic event.

Kahoolawe 3—*Kanaloa kahoolawensis*—c

This unit is critical habitat for *Kanaloa kahoolawensis* and is 5 ha (12 ac) on State (KIRC) land. The unit contains the entirety of Puu Koae Islet. This unit, in combination with a portion of Kahoolawe 2—*Kanaloa kahoolawensis*—b, provides habitat for one population of 100 mature, reproducing individuals of the long-lived perennial *K. kahoolawensis* and is currently unoccupied. The habitat features contained in this unit that are essential for this species include, but are not limited to, steep, rocky talus slopes. Although we do not believe that there is enough habitat that currently exists to reach the recovery goal of 8 to 10 populations for this island-endemic species, the units are essential because they are an appropriate distance apart to avoid their destruction by one naturally occurring catastrophic event.

Effects of Critical Habitat Designation

Section 7 Consultation

Section 7(a)(2) of the Act requires Federal agencies, including the Service, to ensure that actions they fund, authorize, or carry out are not likely to destroy or adversely modify critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal action agency must enter into consultation with us. Section 7(a)(4) of the Act requires Federal agencies (action agency) to confer with us on any action that is likely to jeopardize the continued existence of a species proposed for listing or result in destruction or adverse modification of proposed critical habitat. Destruction or adverse modification of critical habitat occurs when a Federal action directly or indirectly alters critical habitat to the extent that it appreciably diminishes the value of critical habitat for the conservation of the species. Individuals, organizations, States, local governments, and other non-Federal entities are affected by the designation of critical habitat when their actions occur on Federal lands, require a Federal permit, license, or other authorization, or involve Federal funding. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR part 402.

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

If we issue a biological opinion concluding that a project is likely to result in the destruction or adverse modification of critical habitat, we also provide ''reasonable and prudent alternatives'' to the project, if any are identifiable. Reasonable and prudent alternatives are defined at 50 CFR 402.02 as alternative actions identified during consultation that can be implemented in a manner consistent with the intended purpose of the action, that are consistent with the scope of the Federal agency's legal authority and jurisdiction, that are economically and technologically feasible, and that the Director believes would avoid the likelihood of the destruction or adverse modification of critical habitat. Reasonable and prudent alternatives can vary from slight project modifications to extensive redesign or relocation of the project. Costs associated with implementing a reasonable and prudent alternative are similarly variable.

Activities on Federal lands that may affect the critical habitat of one or more of the 60 plant species from Maui and Kahoolawe will require section 7 consultation. Activities on private or State lands requiring a permit from a Federal agency, such as a permit from the U.S. Army Corps of Engineers (Corps) under section 404 of the Clean Water Act (33 U.S.C. 1344 *et seq.,*) the Department of Housing and Urban Development, or a section 10(a)(1)(B) permit from us; or some other Federal action, including funding (*e.g.,* from the Federal Highway Administration, Federal Aviation Administration (FAA), Federal Emergency Management Agency (FEMA), Environmental Protection Agency (EPA), or Department of Energy), regulation of airport improvement activities by the FAA; and construction of communication sites licensed by the Federal Communications Commission, may also be subject to the section 7 consultation process. Federal actions not affecting critical habitat and actions on non-Federal lands that are not federally funded, authorized, or permitted would not require section 7 consultation as a result of this rule designating critical habitat.

Section 4(b)(8) of the Act requires us to briefly describe and evaluate in any proposed or final regulation that designates critical habitat those activities involving a Federal action that may adversely modify such habitat or that may be affected by such designation. We note that such activities may also jeopardize the continued existence of the species.

Activities that, when carried out, funded, or authorized by a Federal agency, may directly or indirectly destroy or adversely modify critical habitat include, but are not limited to:

(1) Activities that appreciably degrade or destroy the primary constituent elements including, but not limited to: Overgrazing; maintenance of feral ungulates; clearing or cutting of native live trees and shrubs, whether by burning or mechanical, chemical, or other means (*e.g.,* woodcutting, bulldozing, construction, road building, mining, herbicide application); introducing or enabling the spread of nonnative species; and taking actions that pose a risk of fire;

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

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

(4) Recreational activities that appreciably degrade vegetation;

(5) Mining of sand or other minerals;

(6) Introducing or encouraging the spread of nonnative plant species into critical habitat units; and

(7) Importation of nonnative species for research, agriculture, and aquaculture, and the release of biological control agents that would have unanticipated deleterious effects on the listed species and the primary constituent elements of their habitats.

If you have questions regarding whether specific activities will likely 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 inquiries about prohibitions and permits may be addressed to the U.S. Fish and Wildlife Service, Division of Endangered Species, 911 N.E. 11th Ave., Portland, OR 97232–4181 (telephone 503/231–2063; facsimile 503/231–6243).

Analysis of Managed Lands Under Section 3(5)(A)

Pursuant to the definition of critical habitat in section 3(5)(A) of the Act, the primary constituent elements as found in any area so designated must also require ''special management considerations or protections.'' Adequate special management or protection is provided by a legally operative plan that addresses the maintenance and improvement of the essential elements and provides for the long-term conservation of the species. We consider a plan adequate when it: (1) Provides a conservation benefit to the species (*i.e.,* the plan must maintain or provide for an increase in the species' population or the enhancement or restoration of its habitat within the area covered by the plan); (2) provides assurances that the management plan will be implemented (*i.e.,* those responsible for implementing the plan are capable of accomplishing the objectives, have an implementation schedule and have adequate funding for the management plan); and, (3) provides assurances that 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 achieve the plan's goals and objectives). If an area is covered by a plan that meets these criteria, it does not constitute critical habitat as defined by the Act because the primary constituent elements found there are not in need of special management or protection.

Currently occupied and historically known sites containing one or more of the primary constituent elements considered essential to the conservation of these 60 plant species were examined to determine the adequacy of special management considerations or protection are required and, consequently, whether such areas meet the definition of critical habitat under section 3(5)(A). We reviewed all available management information on these plants at these sites, including published reports and surveys; annual performance and progress reports; management plans; grants; memoranda of understanding and cooperative agreements; DOFAW planning documents; internal letters and memos; biological assessments and environmental impact statements; and section 7 consultations. Additionally, we contacted the major private landowners on Maui and Kahoolawe by mail and we met with several landowners between the publication of the revised proposal on April 3, 2002, and the end of the comment period on September 30, 2002, to discuss their current management for the plants on their lands. We also met with Maui District DOFAW staff to discuss management activities they are conducting on Maui. In addition, we reviewed new biological information and public comments received during the public comment periods and at the public hearing.

In determining whether a management plan or agreement provides adequate management or protection, we first consider whether that plan provides a conservation benefit to the species. We considered the following threats and associated recommended management actions:

(1) The factors that led to the listing of the species, as described in the final rules for listing each of the species. Effects of clearing and burning for agricultural purposes and of invasive non-native plant and animal species have contributed to the decline of nearly all endangered and threatened plants in Hawaii (Cuddihy and Stone 1990; Howarth 1985; Loope 1998; Scott *et al.* 1986; Service 1994, 1995, 1996, 1997, 1998a, 1998b, 1998c, 1999, 2001; Smith 1985; Stone 1985; Vitousek 1992; Wagner *et al.* 1985).

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

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

(3) The management actions needed for assurance of survival and ultimate recovery of these plants. These actions are described in our recovery plans for these 60 species (Service 1995a, 1995b, 1996a, 1996b, 1997, 1998a, 1998b, 1999, 2001), in the 1998 HPPRCC report to us, and in various other documents and publications relating to plant conservation in Hawaii (Cuddihy and Stone 1990; Mueller-Dombois 1985; Smith 1985; Stone 1985; Stone *et al.* 1992). In addition to monitoring the plant populations, these actions include, but are not limited to: (1) Feral ungulate control; (2) non-native plant control; (3) rodent control; (4) invertebrate pest control; (5) fire management; (6) maintenance of genetic material of the endangered and threatened plant species; (7) propagation, reintroduction, and 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 important in providing a conservation benefit to the species: Feral ungulate control; wildfire management; non-native plant control; rodent control; invertebrate pest control; maintenance of genetic material of the endangered and threatened plant species; propagation, reintroduction, and 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 (Service 1995a, 1995b, 1996a, 1996b, 1997, 1998a, 1998b, 1999, 2001). On a case-by-case basis, these actions may rise to different levels 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.

As shown in Table 2, the 60 species of plants are found on Federal, State, and private lands on the islands of Maui and Kahoolawe. Information received in response to our public notices; meetings with landowners of Maui County and Maui District DOFAW staff; the December 18, 2000, and April 3, 2002, proposals; public comment periods; and the March 20, 2001, and September 12, 2002, public hearings; as well as information in our files, indicated that there is limited on-going conservation management action for these plants, except as noted below. Without management plans and assurances that the plans will be implemented, we are unable to find that the other areas do require special management or protection. The following discussion analyzes current management plans that provide a conservation benefit to the species to assess whether they meet the Service's requirements for adequate management or protection

Federal Lands

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

One species, *Sesbania tomentosa,* occurs on Kanaio Training Area (Hawaii Army National Guard) lands on the island of Maui, and we believe this land is essential for the conservation of this species. In 1998, funds were provided for protective fencing and monitoring of *Sesbania tomentosa* on this land. 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). Because appropriate conservation management strategies have not been adequately funded or effectively implemented for *Sesbania tomentosa* on this land, we cannot at this time find that management of this land under Federal jurisdiction is sufficient to find that they do not meet the definition of critical habitat. Therefore, this area has been included within the critical habitat units.

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 Act 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 special management is not required for the listed plant species, and areas on the island are included within the critical habitat units for *Kanaloa kahoolawensis.*

State of Hawaii Lands

The Upper Areas of Hanawi Natural Area Reserve (HNAR)

Three plant species, *Geranium multiflorum,* and *Clermontia samuelii* ssp. *hanaensis,* and Cyanea mceldowneyi are reported from the upper areas of HNAR (GDSI 2000; HINHP Database 2000). The HNAR was established in 1986, and comprises 3,035 ha (7,500 ac) of diverse native ecosystems and endangered forest bird habitat. The Department of Land and Natural Resources (DLNR) manages Natural Area Reserves, except that any use must be specifically approved by the Natural Area Reserve System Commission. The State holds Natural Area Reserves in trust and they may not be non-nativeated 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. sections 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 non-native 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 809 ha (2,000 ac) has been fenced and pigs removed. Fences have been 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, Poouli Unit, and Kuhiwai/Waieleele 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'' (Willian Evanson, DLNR, 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 ongoing. Weeds are controlled manually, chemically, or through a combination of both. Monitoring transects help locate developing populations of other priority weed species and, if necessary, removal of these populations is conducted (DLNR 1989).

Because *Geranium multiflorum* and *Clermontia samuelii* ssp. *hanaenis* and their habitats within the upper areas of HNAR (above 1,525 m (5,000 ft) elevation) are permanently protected and managed by State law and because the continued successful management of this area is assured by State funding, HRS 195–9 (Natural Area Reserve Fund; Heritage Program; established) establishes in the state treasury a special fund known as the natural area reserve fund to implement the purposes of this chapter, including the identification, establishment, and management of natural area reserves * * * the fund shall be administered by the department [DLNR]. Since its establishment, DLNR has received funding for this program each year from the Legislature and funding for natural resource programs such as this is a high priority and unlikely to be discontinued (Randy Kennedy, Native Resource Program Manager, DOFAW, pers. comm. 2003). 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 HNAR does not meet the definition of critical habitat in the Act, and we are not designating 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)) as workload and resources allow.

Private Lands

The Nature Conservancy of Hawaii's Waikamoi and Kapunakea Preserves, which are located on the northeastern slopes of Haleakala and in the West Maui mountains, respectively

Lands within The Nature Conservancy of Hawaii's (TNCH) Maui preserves were not included within proposed critical habitat. Sixteen species (*Alectryon macrococcus, Argyroxiphium sandwicense* ssp. *macrocephalum, Asplenium fragile* var. *insulare, Bonamia menziesii, Colubrina oppositifolia, Ctenitis squamigera, Cyanea lobata, Diplazium molokaiense, Geranium arboreum, Geranium multiflorum, Melicope balloui, Phlegmariurus mannii, Plantago princeps, Platanthera holochila, Remya mauiensis,* and *Sanicula purpurea*) are reported from TNCH's Waikamoi and Kapunakea Preserves, which are located on the northeastern slopes of Haleakala and in the West Maui mountains, respectively (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 DLNR and DLNR makes annual inspections of the work in the reserve areas. *See* Haw. Rev. Stat. sections 195–1—195–11; Hawaii Administrative Rules section 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 ten 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 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 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 extends 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 non-native 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 ongoing. Weeds are controlled manually, chemically, or through a combination of both. Preventive measures (prevention protocol) are required by all who enter the preserves. This protocol includes such things as brushing footgear 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 State Division of Conservation and Resources Enforcement (DOCARE) in marijuana control, as needed.

The effects of nonnative invertebrates and small mammals on native Hawaiian ecosystems are 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 Honokowai section of the West Maui NAR. TNCH currently acts as a consultant to Maui Land and Pineapple Company, managers of Puu Kukui WMA, and has a Master Cooperative Agreement with 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, Koolau Forest Reserve, and the State's Hanawi NAR. An agreement between the DLNR, East Maui Irrigation Company, Keola Hana Maui Inc., Haleakala Ranch Company, County of Maui, TNCH, and Haleakala National Park was signed in order to implement a joint management plan (East Maui Watershed Partnership Plan) for the entire East Maui Watershed. Management efforts at Waikamoi complement the objectives of the plan as much as possible. The partnership agreement is being 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 provide a conservation benefit to the species and because they are permanently protected and managed, these lands are not in need of special management or protection. 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 designating 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)).

Maui Land and Pineapple Co., Ltd.

Maui Pineapple Company's Puu Kukui WMA, Located in The West Maui Mountains

Lands within Maui Land and Pineapple Co.'s Puu Kukui Watershed Management Area, located in the West Maui Mountains, were included in proposed critical habitat on Maui. Eight species (*Ctenitis squamigera, Clermontia oblongifolia* ssp. *mauiensis, Cyanea lobata, Cyrtandra munroi, Hesperomannia arborescens, Phlegmariurus mannii, Platanthera holochila,* and *Sanicula purpurea*) are reported from the Puu Kukui WMA (GDSI 2000; HINHP Database 2000; Maui Land and Pineapple Co., Ltd. undated). In the December 18, 2000, proposal we proposed that lands within the Puu Kukui WMA were adequately managed for the conservation of the listed species that occur on those lands and were not in need of special management considerations or protection. Therefore, we proposed that these lands did not meet the definition of critical habitat in the Act, and we did not propose designation of these lands as critical habitat. However, during the comment periods on the December 18, 2000, proposal we received information from the Watershed Supervisor that funding for the conservation and management of the listed plant species on lands within Puu Kukui WMA was not adequate nor assured. However, during the comment periods for the April 3, 2002, proposal we received yet more information from the Watershed Supervisor that, contrary to the previous comments submitted, funding for Puu Kukui WMA was indeed secure. In his September 30, 2002, letter to us the Puu Kukui Watershed Supervisor stated that since 1988 Maui Land and Pineapple has proactively managed Puu Kukui Watershed and that they are currently in their second, six-year contract with the State of Hawaii's NAP Program to preserve the native biodiversity of their conservation lands. They are also receiving funding from the Service to survey for rare plants on their lands and build feral ungulate control fences for the protection of listed plants. In other words, they have a history of self-funding and conducting proactive conservation efforts in Puu Kukui, they are enrolled in the State's NAP Program and they receive funding from the Service to support their conservation efforts. Therefore, we have determined that the private land within Puu Kukui WMA does not meet the definition of critical habitat in the Act as discussed below, and we are not designating critical habitat on this land.

At just over 3,483 ha (8,600 ac), 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 NAP program. In the NAP program, Puu Kukui WMA staff are 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 non-native 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 removal of ungulates within the Puu Kukui WMA.

The nonnative plant control program within Puu Kukui WMA focuses on habitat modifying 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 *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, nonnative 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, and remote survey trips within the watershed is provided.

For these reasons, Puu Kukui WMA meets the three criteria for determining that an area is not in need of special management as discussed 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 designating 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)).

In summary, we believe that the habitat within Waikamoi and Kapunakea Preserves, Puu Kukui WMA, and the upper area (above 1,525 m (5,000 ft)) of Hanawi NAR, 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 designating these lands as critical habitat.

Analysis of Impacts Under Section 4(b)(2)

Section 4(b)(2) of the Act requires us to designate critical habitat on the basis of the best scientific information available, and to consider the economic and other relevant impacts of designating a particular area as critical habitat. We may exclude areas from critical habitat upon a determination that the benefits of exclusion outweigh the benefits of specifying such areas as critical habitat. We cannot exclude such areas from critical habitat when exclusion will result in the extinction of the species concerned.

Economic Impacts

Following the publication of the revised proposed critical habitat designation on April 5, 2002, a draft economic analysis (DEA) was prepared to estimate the potential economic impact of the proposed designation in accordance with the Court's decision in the *N.M. Cattlegrowers Ass'n* v. *U.S. Fish and Wildlife Serv.,* 248 F.3d 1277 (10th Cir. 2001). The draft analysis was made available for review on October 2, 2002 (67 FR 61845). We accepted comments on the draft analysis until November 2, 2002.

Our draft economic analysis evaluated the potential direct and indirect economic impacts of section 7 associated with the proposed critical habitat designation for the 61 plant species from the islands of Maui and Kahoolawe over the next ten years. Direct impacts are those related to consultations under section 7 of the Act. They include the cost of completing the section 7 consultation process and potential project modifications resulting from the consultation. Indirect impacts are secondary costs and benefits that could occur coextensively with critical habitat designation, but are not necessarily directly related to the Act. Examples of indirect impacts include potential effects to property values, potential effects of redistricting of land from agricultural or urban to conservation, and social welfare benefits of ecological improvements.

The categories of potential direct and indirect costs considered in the analysis included the costs associated with: (1) Conducting section 7 consultations including incremental consultations and technical assistance; (2) Modifications to projects, activities, or land uses resulting from the section 7 consultations; (3) Uncertainty and public perceptions resulting from the designation of critical habitat including potential indirect costs resulting from the loss of hunting opportunities and the interaction of State and local laws; and (4) Potential offsetting beneficial impacts associated with critical habitat, including educational benefits. The most likely economic effects of critical habitat designation are on activities funded, authorized, or carried out by a Federal agency (*i.e.*, direct costs).

The analysis in the DEA incorporates two baselines: one which addresses the impact of critical habitat designation that may be ''attributable co-extensively'' to the listing of the species and one which addresses the incremental impact of the critical habitat designation itself.

This Addendum utilizes one baseline and analyzes the impacts of critical habitat designation that may be attributable co-extensively to the listing of the species. Because of the potential uncertainty about the benefits and economic costs resulting solely from critical habitat designations, the Service believes that it is reasonable to estimate the effects of the designation utilizing this approach to avoid understating potential economic impacts. It is important to note that the inclusion of impacts attributable co-extensively to the listing does not convert the economic analysis into a tool to be considered in the context of a listing decision.

The addendum incorporates public comments on the draft analysis and makes other changes in the draft. These changes were primarily the result of modifications made to the proposed critical habitat designation based on biological information received during the comment periods. In addition, we have completed an amendment to the addendum in which we have examined the potential economic impacts of a critical habitat designation in areas that were not included in the original proposal because we believed they were areas essential to the conservation of the species but did not require special management considerations or protection and thus could be excluded from designation under section 3(5)(a) of the Act.

Together, the draft economic analysis, the addendum and the addendum amendment constitute our final economic analysis. The draft economic analysis estimated the total direct cost of the designation of critical habitat on Maui and Kahoolawe for the 60 plant species co-extensive with the listing to be between $418,700 and $2,075,600 over 10 years. This direct cost was revised in the addendum to $241,700 to $1,441,200 over 10 years. The reduction of $177,000 to $634,400 from the costs estimated in the draft economic analysis is primarily due to the exclusion of some proposed units and the significant reduction in size of other proposed units. Using a seven percent discount rate and assuming these direct costs are distributed evenly over the 10-year period, the annualized direct costs range from $24,170 to $144,120 per year.

Certain costs identified the final economic analysis are based on ''worst-case'' scenarios that, while possible, do not seem likely based on past consultation histories for these species. In particular, the final economic analysis includes an evaluation of potential indirect costs associated with the designation of critical habitat for 60 plant species on Maui and Kahoolawe. These reported costs are speculative and, in general, thought to have a low probability of occurrence. In addition, the final economic analysis discusses economic benefits in qualitative terms rather than providing quantitative estimates because of the lack of information available to estimate the economic benefits of endangered species preservation and ecosystem improvements.

The likely direct cost impact of designating critical habitat on Maui and Kahoolawe for the 60 plant species is estimated to be between $24,170 to $144,120 per year over the next 10 years. This estimate, however, includes areas that were proposed as critical habitat, but have been excluded under sections 3(5)(a) and/or 4(b)(2) of the Act. Therefore, the direct cost of designating critical habitat for these 60 plant species is likely to be somewhat less than this amount.

A more detailed discussion of our economic analysis is contained in the draft economic analysis and the addendum. Both documents are included in our administrative record and are available for inspection at the Pacific Islands Fish and Wildlife Office (*see* **ADDRESSES** section).

Other Impacts

As described in the ''Analysis of Managed Lands Under Section 3(5)(A)'' section above, based on our evaluation of the adequacy of special management and protection that is provided in current management plans involving *Alectryon macrococcus, Argyroxiphium sandwicense* ssp. *macrocephalum, Asplenium fragile* var. *insulare, Bonamia menziesii, Clermontia oblongifolia ssp. mauiensis, Clermontia samuelii, Colubrina oppositifolia, Ctenitis squamigera, Cyanea lobata, Cyanea mceldowneyi, Cyrtandra munroi, Diplazium molokaiense, Geranium arboreum, Geranium multiflorum, Hesperomannia arborescens, Melicope balloui, Phlegmariurus mannii, Plantago princeps, Platanthera holochila, Remya mauiensis,* and *Sanicula purpurea* in accordance with section 3(5)(A)(i) of the Act, we have not included TNCH's Waikamoi and Kapunakea Preserves, Maui Land and Pineapple's Puu Kukui WMA, and the State's upper Hanawi NAR lands, in this final designation of critical habitat. However, to the extent that special management considerations and protection may be required for these areas, and they therefore meet the definition of critical habitat according to section 3(5)(A)(i), they are properly excluded from designation under section 4(b)(2) of the Act, based on the following analysis.

In addition, approximately 3,894 ha (9,622 ac) within five proposed critical habitat units (Maui units H, I1, I2, and I4) located on private lands owned by Ulupalakua and Haleakala Ranches are excluded from designation under section 4(b)(2) because the benefits provided by these two landowners' voluntary conservation activities within and adjacent to these units outweigh the benefits provided by a designation of critical habitat.

The Service believes that designation of critical habitat on these lands would be a disincentive to those that have demonstrated a willingness to manage their lands in a manner compatible with the conservation of listed and non-listed species on Maui and Kahoolawe. Designation, therefore, would have a strong possibility of having a detrimental effect on the recovery of the listed species on these lands. The exclusion of these lands from critical habitat, on the other hand, will help improve and maintain our positive relationship with the landowners involved and it will also provide incentives to other landowners on Maui and Kahoolawe to consider implementing similar voluntary conservation activities, conservation partnerships, and beneficial natural resource programs on their lands.

TNCH's Waikamoi and Kapunakea Preserves contain occupied habitat for 13 species (*Alectryon macrococcus, Argyroxiphium sandwicense* ssp. *macrocephalum, Asplenium fragile* var. *insulare, Bonamia menziesii, Colubrina oppositifolia, Ctenitis squamigera, Cyanea lobata, Diplazium molokaiense, Geranium arboreum, Geranium multiflorum, Plantago princeps, Platanthera holochila,* and *Sanicula purpurea*) and unoccupied habitat for three species (*Melicope balloui, Phlegmariurus mannii,* and *Remya mauiensis*). The State's upper Hanawi NAR contains occupied habitat for *Clermontia samuelii* and *Geranium multiflorum,* and unoccupied habitat for *Cyanea mceldowneyi.* Eight species (*Ctenitis squamigera, Clermontia oblongifolia* ssp. *mauiensis, Cyanea lobata, Cyrtandra munroi, Hesperomannia arborescens, Phlegmariurus mannii, Platanthera holochila,* and *Sanicula purpurea*) occur within the Maui Land and Pineapple Company's Puu Kukui WMA. For a more detailed description of the management activities conducted on TNCH's Waikamoi and Kapunakea Preserves, the State's Hanawi NAR and Maui Land and Pineapple's Puu Kukui WMA, see the ''Analysis of Managed Lands Under Section 3(5)(A)'' section.

The portion of proposed unit Maui H on Ulupalakua Ranch lands is occupied habitat for nine species: *Alectryon macrococcus; Bonamia menziesii; Cenchrus agrimonioides; Flueggea neowawraea; Geranium arboreum; Lipochaeta kamolensis; Melicope adscendens; Melicope knudsenii;* and *Melicope mucronulata.* It is unoccupied habitat for three species: *Clermontia lindseyana; Colubrina oppositifolia;* and *Diellia erecta.*

Ulupalakua Ranch is involved in several important voluntary conservation agreements and is currently carrying out some of these activities for the conservation of these species. For example, the Partners for Fish and Wildlife Auwahi and Puu Makua agreements were entered into in fiscal year 1997 and 1998 with the stated purpose of protecting and restoring dryland forest including construction of exclosure fences, a greenhouse, access road, and propagation and outplanting of native plants. Preservation of these areas conserves critically endangered species of plants and animals in one of Hawaii's most degraded ecosystem types (lowland dry forest). This management strategy is consistent with recovery of these species. The Auwahi agreement (Auwahi I Project) is between Ulupalakua Ranch, USGS–BRD, and the Service. The Service provided funding ($64,388) for fence materials, plant

propagation and outplanting, and weed control, Ulupalakua Ranch provided labor and materials valued at $18,000, and USGS–BRD provided materials and technical assistance as well as staff and volunteer labor. In the 4 ha (10 ac) Auwahi project area, Ulupalakua Ranch has built the exclosure fence, outplanted native plants grown in the greenhouse including *Alectryon macrococcus* var. *auwahiensis* and *Zanthoxylum hawaiiense,* removed the majority of nonnative alien species within the fence, and removed all ungulates. The Service provided $31,675 through an agreement with Ulupalakua Ranch for restoration work at Puu Makua. Ulupalakua Ranch has provided in-kind labor and materials valued at $37,055 to construct a fence around the 40-ha (100-ac) exclosure, removal of ungulates, control of nonnative plants and out-planting of native plants. The first two tasks have been completed, with weed control and out-planting ongoing.

A third voluntary partnership project undertaken in cooperation with the Ulupalakua Ranch is the Auwahi II Dryforest Restoration Project. The Service provided $76,500 (matched by in-kind services valued at $52,000) for this 8-ha (20-ac) restoration effort adjacent to the Auwahi I project. This project is ongoing, and will employ the same methods used at Auwahi I: construct of ungulate exclosure fence; remove ungulates; control nonnative plants; and out-plant native species (including listed species).

In addition, Ulupalakua Ranch entered a partnership with Ducks Unlimited, a private conservation organization, and the Natural Resources Conservation Service's (NRCS) Wetland Reserve Program in 2000, to create wetland complexes suitable for two endangered birds, the Hawaiian Goose, nene (*Branta sandvicensis*) and Hawaiian duck, koloa (*Anas wyvilliana*). NRCS Wetland Reserve Program (WRP) provided $100,000 for funding and technical support to develop the wetland complex, Ducks Unlimited provided matching funds and provided full survey, design, construction management and completion of wetland development practices, and Ulupalakua Ranch provided fencing, equipment, labor or other in-kind services as required to match the WRP funds. Ducks Unlimited also conducted waterfowl monitoring at the four ponds for one full year after pond construction. In 2001, a 14 ha (35 ac) area was fenced and encompassed four constructed artificial ponds and associated upland habitat at a 1,585 m (5,200 ft) elevation site. The ponds were created to attract nene and koloa pairs to forage and nest within the protected pond/wetland area, which totals approximately 0.4 ha (1 ac) of surface water, with 1–2 m (3–6 ft) depths filled and maintained by natural hydrology and rainfall. Nene may naturally disperse to Ulupalakua Ranch from Haleakala National Park and the few koloa now present on Maui may disperse to potential higher elevation habitat at the ranch. Normal grazing and management of pasture lands throughout Ulupalakua Ranch will also provide additional foraging areas for nene.

As endangered species are anticipated on the ranch, Ulupalakua Ranch is developing a Safe Harbor Agreement with the Service and the State through the Safe Harbor program. The Safe Harbor program encourages proactive management to benefit endangered and threatened species on non-Federal lands by providing regulatory assurances to landowners that no additional Endangered Species Act restrictions will be imposed on future land, water, or resource use for enrolled lands. The intended purpose of the ranch's Safe Harbor Agreement is to restore and enhance foraging and breeding habitat for two endangered Hawaiian waterbirds at Ulupalakua Ranch in East Maui. Under this Agreement, Ulupalakua Ranch will create a fenced 14-ha (35-ac) pond/wetland area and maintain it for 20 years. If endangered species are attracted to the area, Ulupalakua Ranch's voluntary conservation activities will contribute to recovery by increasing their reproduction, survival, and distribution on Maui.

The portion of proposed units Maui H, I1, I2, and I4 on Haleakala Ranch Company lands is occupied habitat for seven species: *Alectryon macrococcus; Cyanea mceldowneyi; Diellia erecta; Diplazium molokaiense; Geranium arboreum; Melicope balloui;* and *Phlegmariurus mannii.* It is unoccupied habitat for 11 species: *Argyroxiphium sandwicense* ssp. *macrocephalum; Asplenium fragile* var. *insulare; Clermontia lindseyana; Cyanea glabra; Geranium multiflorum; Lipochaeta kamolensis; Neraudia sericea; Phyllostegia mannii; Phyllostegia mollis; Plantago princeps; and Platanthera holochila.*

Haleakala Ranch Company is involved in several important voluntary conservation agreements that benefit the species included in the proposed critical habitat. For example, in the mid-1980s, Haleakala Ranch Company granted TNCH a perpetual conservation easement that included over 19,000 ha (47,000 ac) (Waikamoi Preserve) on Maui in order to protect its native forest resources and watershed from damage caused by pigs and cattle. Haleakala Ranch Company has been working with the Central Maui Soil and Water Conservation District to address soil and resource issues. In cooperation with the NRCS Environmental Quality Incentives Program (EQIP), Haleakala Ranch Company has implemented a weed control program that has been on-going for over 80 years. Eight years ago, the Haleakala Ranch Company Directors created and filled a Land Steward position in order to shepherd the ranch's conservation efforts and update the conservation plans for all Haleakala Ranch Company lands.

In addition, the Service's Partners for Fish and Wildlife Puu Pahu agreement with Haleakala Ranch Co. and NRCS within proposed unit Maui I1 was entered into in fiscal year 2001 with the stated purpose of protecting and restoring native subalpine dry shrubland. This agreement included construction of a 6.9 km (4.3 mi) exclosure fence and removal of ungulates within the area in order to allow the already semi-intact native vegetation to regenerate. Preservation of this area conserves critically endangered species of plants and animals in one of Hawaii's most restricted ecosystem types (subalpine dry shrubland). This management strategy is consistent with the recovery of these species. The Service and NRCS provided funding for fencing materials ($91,418 from the Service) and are providing technical assistance on the conservation of *Geranium arboreum* and restoration of the subalpine dry shrubland. Haleakala Ranch Co. is building the fence and removing the ungulates (in-kind cost-share valued at $28,875). This work is planned for completion by August 30, 2003. Haleakala Ranch Co. has also worked with DOFAW for the past 2 years on an ungulate-free reserve for native habitat regeneration in the Waiopae area. Haleakala Ranch Co. is fencing the area to improve grazing management from the forest to the shoreline. These actions will include riparian protection to improve habitat for native plants, especially *Lipochaeta kamolensis* and *Alectryon macrococcus,* and watershed management.

According to our published recovery plans, recovery of the species addressed in this rule will require self-sustaining populations distributed across the landscape of sufficient robustness to withstand periodic threats due to natural disaster or biological threats (Service 1995a, 1995b, 1996a, 1996b, 1997, 1998a, 1998b, 1999, 2001). The highest priority recovery tasks include active management such as plant

propagation and reintroduction, fire control, nonnative species removal, and ungulate fencing. Failure to implement these management measures, all of which require voluntary landowner support and participation, virtually assures the extinction of these species. Many of these types of conservation actions in these areas of Maui are carried out as part of TNCH's, the State's, ML&P's, and Ulupalakua and Haleakala Ranch's participation in landowner incentive-based programs, and by actions taken on the landowner's initiative, as well as by actions taken on the State's prioritization and initiative, and Ulupalakua Ranch's and Haleakala Ranch's participation with the Service's Partners for Fish and Wildlife. These activities, which are described in more detail above, require substantial voluntary cooperation by each entity and other cooperating landowners and local residents.

The following analysis describes the likely conservation benefits of a critical habitat designation compared to the conservation benefits without critical habitat designation. In particular we considered: to what extent a critical habitat designation would confer additional regulatory conservation benefits on these species; to what extent the designation would provide an educational benefit to the members of the public that would lead to enhanced conservation; and whether the critical habitat designation would have a positive, neutral, or negative impact on voluntary conservation efforts on each landowner's lands as well as other non-Federal lands on Maui that could contribute to recovery.

(1) Benefits of Inclusion

These areas contain habitat essential to the conservation of the species listed for each area as described above. The primary direct benefit of inclusion of these lands as critical habitat would result from the requirement under section 7 of the Act that Federal agencies consult with us to ensure that any proposed Federal actions do not destroy or adversely modify critical habitat.

The benefit of a critical habitat designation would ensure that any actions authorized, funded or carried out by a Federal agency would not likely destroy or adversely modify any critical habitat. Without critical habitat, some site-specific projects might not trigger consultation requirements under the Act in areas where species are not currently present; in contrast, Federal actions in areas occupied by listed species would still require consultation under section 7 of the Act to determine if the action is likely to jeopardize the continued existence of the listed species.

Much of the area on TNCH's lands is already occupied habitat for 13 of the 16 listed species. Therefore, any Federal activities that may affect these areas will likely require section 7 jeopardy consultation. Historically, we have conducted only one informal consultation under section 7 regarding Federal actions on TNCH's land on Maui. This consultation was conducted with the U.S. Department of Agriculture to review the effect of feral pig removal on listed endangered and threatened species within Waikamoi and Kapunakea Preserves. Thirteen of the 60 species, *Alectryon macrococcus, Argyroxiphium sandwicense* ssp. *macrocephalum, Asplenium fragile* var. *insulare, Bonamia menziesii, Colubrina oppositifolia, Ctenitis squamigera, Cyanea lobata, Diplazium molokaiense, Geranium arboreum, Geranium multiflorum, Plantago princeps, Platanthera holochila,* and *Sanicula purpurea,* are known to occur within the preserves.

Much of the area on State lands is already occupied habitat for two of the three listed species. Therefore, any Federal activities that may affect these areas will likely require section 7 jeopardy consultation. Historically, we have conducted one formal consultation and 16 informal consultations under section 7 on the islands of Maui and Kahoolawe for one or more of the 60 plant species. None of these consultations involved this State land.

Much of the area in the ML&P's Puu Kukui WMA is already occupied by *Ctenitis squamigera, Clermontia oblongifolia* ssp. *mauiensis, Cyanea lobata, Cyrtandra munroi, Hesperomannia arborescens, Phlegmariurus mannii, Platanthera holochila,* and *Sanicula purpurea.* Therefore, any Federal activities that may affect these areas will in all likelihood require section 7 jeopardy consultation. Historically, we have conducted one informal consultation for this property. It addressed the beneficial effects of Federal funding for ungulate exclusion on listed endangered and threatened species within the Puu Kukui Partnership Project area.

On Maui, historically we have conducted only one formal consultation and 16 informal consultations under section 7 for any of the plant species found on Maui. Of these, only two informal consultations were conducted on Ulupalakua Ranch. These were intra-Service consultations on the effects of fencing and outplanting within the Puu Makua Partnership Project area and the Auwahi Partnership Project area (see discussion below).

We have never completed a section 7 consultation on Haleakala Ranch Company's lands (although one is in the process of being completed for the Puu Pahu project that the Service is funding in part).

As a result of the low level of previous Federal activity on these lands, and after considering the future Federal activities that might occur on these lands, it is the Service's opinion that there is likely to be a low number of future Federal activities that would adversely affect habitat on the lands described above. Therefore, we anticipate little additional regulatory benefits from including these areas in critical habitat beyond what is already provided by the existing section 7 nexus for habitat areas occupied by the listed extant species.

Another possible benefit of designating critical habitat is that the designation can educate the public regarding the potential conservation value of an area, which may contribute to conservation efforts by other parties by clearly delineating areas of high conservation value for certain species. Information about the species for which suitable habitat was identified on these lands on Maui, including other parties engaged in conservation activities, could have a positive conservation benefit for the species.

While we believe this educational outcome is important for the conservation of these species, we believe it has already been achieved through the existing management, education, and public outreach efforts carried out by land owners and their conservation partners. The Nature Conservancy of Hawaii has a well-developed public outreach infrastructure that includes magazines, newsletters, and well-publicized public events on Maui and throughout Hawaii. The State has a well-developed public outreach infrastructure that includes websites, newsletters, and well-publicized public events on Maui and throughout Hawaii. ML&P features the Puu Kukui Watershed preserve on its Web site (*http://www.maui.net/mauilnp/puu_kukui.html*) and the Puu Kukui Watershed department staff hold monthly volunteer weed service trips throughout the year. An annual boardwalk hike ($1,500/person) for a dozen people is held in August/September with one free ''prize'' slot reserved for the student winner of an environmental essay contest from Maui County high schools (Randy Bartlett, Watershed Management Supervisor, ML&P, in litt., 2002). Through the

critical habitat designation process, the portion of unit Maui H that lies within Ulupalakua Ranch and the portion of units Maui H, I1, I2, and I4 that lie within Haleakala Ranch have been identified as essential to the conservation of 25 of the 60 Maui plant species addressed in this rule. In addition, the existing conservation activities being conducted within proposed unit Maui H that lies within Ulupalakua Ranch and the portion of proposed units Maui H, I1, I2, and I4 that lie within Haleakala Ranch, as well as other portions of each ranch, by the Service and other Federal agencies (*e.g.*, USDA NRCS), the State, and private organizations (*e.g.*, Ducks Unlimited) demonstrate that the public is already aware of the importance of this area for the conservation of the species located on each ranch. These examples and other media extol and explain the conservation importance of these lands and their conservation value. A final designation of critical habitat would simply affirm what is already widely accepted by Hawaii's conservationists, public agencies, and most of the public concerning the conservation value of these lands.

In sum, we believe that a critical habitat designation for listed plants on these lands on Maui would provide a relatively low level of additional regulatory conservation benefit to each of the plant species beyond what is already provided by existing section 7 consultation requirements due to the physical presence of the listed species. Any regulatory conservation benefits would accrue through the benefit associated with additional section 7 consultation associated with critical habitat. Based on a review of past consultations and consideration of the likely future activities in this specific area, there is little Federal activity expected to occur on this land that would trigger section 7 consultation. The Service also believes that a final critical habitat designation provides little additional educational benefits since the conservation value is already well known by the landowner, the State, Federal agencies, private organizations, and the public.

(2) Benefits of Exclusion

Proactive voluntary conservation efforts are necessary to prevent the extinction and promote the recovery of these listed plant species on Maui and other Hawaiian islands (Shogren *et al.* 1999, Wilcove and Chen 1998, Wilcove *et al.* 1998). Consideration of this concern is especially important in areas where species have been extirpated and their recovery requires access and permission for reintroduction efforts (Bean 2002, Wilcove *et al.* 1998). For example, three of the 16 species associated with Waikamoi and Kapunakea Preserve are extirpated from TNCH lands, *Cyanea mceldownei* associated with Hawaii NAR lands, three of the 12 species associated with proposed unit Maui H on Ulupalakau Ranch, and 11 of the 18 species associated with proposed units Maui H, I1, I2, and I4 on Haleakala Ranch Company are extirpated from these respective lands, and repopulation is likely not possible without human assistance and landowner cooperation. Although none of the species associated with ML&P lands are extirpated, augmentation of existing populations and establishment of new populations are also likely not possible without human assistance and landowner cooperation.

As described earlier, TNCH, the State, and ML&P have a history of entering into conservation agreements with various Federal and State agencies and other private organizations on their lands. The Nature Conservancy's mission is to preserve the plants, animals and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive. The State's NAR mission is to preserve and protect representative samples of the Hawaiian biological ecosystems and geological formations. One of ML&P's missions is to practice prudent stewardship of their land and water resources ensuring the protection of crucial water resources for the community, as well as the rare and endangered species of plants and animals.

To address the conservation needs of the species in a larger area, Ulupalakua Ranch has expanded their Partners for Fish and Wildlife projects with the Service, in cooperation with the State NAR program for conserving additional areas, which include the following important voluntary actions by Ulupalakua Ranch: (1) Construction of exclosure fencing around a portion of Ulupalakua Ranch and the Kanaio NAR (a portion of proposed Maui unit H) with $50,000 provided by Service, matched by in-kind services (*e.g.*, labor and materials) valued at $50,000; (2) Active management of feral ungulates that are negatively impacting listed plants within the fenced areas; (3) Active management of nonnative grasses and other fire hazards, and development of fire control measures; and (4) Nursery propagation and planting of native flora, including some of the 12 species, within the fenced areas.

Haleakala Ranch Company informed the Service that they are currently devising management plans for conserving resources, which include the following important voluntary actions by Haleakala Ranch Company: (1) Construction of a 9 ha (22 ac) exclosure fence around Keokea Gulch in Kihei to reduce sedimentation on the shoreline and reef and to reduce the fire hazard in the area by using R–1 reclaimed water to irrigate a riparian buffer. construction of an exclosure fence for a dryland lava flow in the Keokea area. In cooperation with DOFAW, fence construction of an exclosure in the Waiopae area for habitat protection of native forest and riparian areas (proposed units H, I1, I2, and I4); (2) Control of feral ungulates that are negatively impacting listed plants within the fenced areas; (3) Control of nonnative grasses and other fire hazards, and development of fire control measures; and (4) Habitat protection for natural regeneration of native flora within the fenced areas.

The Service believes that each of the listed species within these areas is benefitting substantially from the landowner's proactive management actions. Voluntary management actions include a reduction in ungulate browsing and habitat conversion, a reduction in competition with nonnative weeds, a reduction in risk of fire, and the reintroduction of species currently extirpated from various areas, and for which the technical ability to propagate these species currently exists or will be developed in the near future.

The conservation benefits of critical habitat are primarily regulatory or prohibitive in nature. But on Maui, simply preventing ''harmful activities'' alone will not slow the extinction of listed plant species (Bean 2002). Where consistent with the discretion provided by the Act, the Service believes it is necessary to implement policies that provide positive incentives to private landowners to voluntarily conserve natural resources and that remove or reduce disincentives to conservation (Wilcove *et al.* 1998). Thus, we believe it is essential for the recovery of these species to build on continued conservation activities such as these with a proven partner, and to provide positive incentives for other private landowners on Maui who might be considering implementing voluntary conservation activities but have concerns about incurring incidental regulatory or economic impacts.

Approximately 80 percent of imperiled species in the United States occur partly or solely on private lands where the Service has little management

authority (Wilcove *et al.* 1996). In addition, recovery actions involving the reintroduction of listed species onto private lands require the voluntary cooperation of the landowner (Bean 2002, James 2002, Knight 1999, Main *et al.* 1999, Norton 2000, Shogren *et al.* 1999, Wilcove *et al.* 1998). Therefore, ''a successful recovery program is highly dependent on developing working partnerships with a wide variety of entities, and the voluntary cooperation of thousands of non-Federal landowners and others is essential to accomplishing recovery for listed species' (Crouse *et al.* 2002). Because the Federal government manages relatively little land on Maui, and because large tracts of land suitable for conservation of threatened and endangered species are mostly owned by private landowners, successful recovery of listed species on Maui is especially dependent upon working partnerships and the voluntary cooperation of non-Federal landowners.

Therefore, the Service believes that excluding these lands from critical habitat will help maintain and improve our partnership relationship with these landowners by recognizing their positive contribution to conservation on Maui. It will also reduce the cost and logistical burden of unnecessary regulatory oversight. We also believe this recognition will provide other landowners with a positive incentive to undertake voluntary conservation activities on their lands, especially where there is no regulatory requirement to implement such actions.

(3) The Benefits of Exclusion Outweigh the Benefits of Inclusion

Based on the above considerations, and consistent with the direction provided in section 4(b)(2) of the Act, we have determined that the benefits of excluding the following areas as critical habitat for the Maui plant species concerned that occur on these lands as described above: TNCH's Maui preserves, the State's Hawaii NAR, ML&P's Kukui WMA, the Ulupalakua Ranch portion of proposed unit Maui H, and the Haleakala Ranch portion of proposed units Maui H, I1, I2, and I4.

This conclusion is based on the following factors:

(i) TNCH's mission is to preserve the plants, animals and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive. Therefore, all of their preserve lands are currently being managed on a voluntary basis in cooperation with the Service, State, and other private organizations to achieve important conservation goals. In the past, TNCH has cooperated with Federal and State agencies, and private organizations to implement voluntary conservation activities on their lands that have resulted in tangible conservation benefits.

The State's NAR mission is to preserve and protect representative samples of the Hawaiian biological ecosystems and geological formations. Therefore, the Hanawi NAR lands are currently being managed on a proactive basis in cooperation with the Service, the National Park, and private organizations to achieve important conservation goals. In the past, the State has cooperated with Federal agencies, and private organizations to implement proactive conservation activities on their lands that have resulted in tangible conservation benefits.

One of ML&P's missions is to practice prudent stewardship of their land and water resources ensuring the protection of crucial water resources for the community, as well as the rare and endangered species of plants and animals. Therefore, all of their Puu Kukui WMA lands are currently being managed on a voluntary basis in cooperation with the Service, State, and other private organizations to achieve important conservation goals. In the past, ML&P has cooperated with Federal and State agencies, and private organizations to implement voluntary conservation activities on their lands that have resulted in tangible conservation benefits.

A substantial amount of the Ulupalakua Ranch portion of proposed unit Maui H are currently being managed by the landowner on a voluntary basis in cooperation with us, the State of Hawaii, and USGS–BRD to achieve important conservation goals. In the past, Ulupalakua Ranch has cooperated with us, the State, and other organizations to implement voluntary conservation activities on their lands that have resulted in tangible conservation benefits.

A substantial amount of the Haleakala Ranch Co. portion of proposed units H, I1, I2, and I4 is currently being managed by the landowner on a voluntary basis in cooperation with us, the State of Hawaii, USGS–BRD, and TNCH to achieve important conservation goals. In the past, Haleakala Ranch has cooperated with us, the State, and other organizations to implement voluntary conservation activities on their lands that have resulted in tangible conservation benefits.

(ii) Simple regulation of ''harmful activities'' is not sufficient to conserve these species. Landowner cooperation and support is required to prevent the extinction and promote the recovery of all of the listed species on Maui due to the need to implement proactive conservation actions such as ungulate management, weed control, fire suppression, plant propagation, and outplanting.

The need for TNCH's cooperation is especially acute because 3 of the 16 reported species are not currently found on the preserves. Future conservation efforts, such as translocation of these three plant species on to these lands and expansion of the extant species, will require the cooperation of TNCH and other non-Federal landowners on Maui. Exclusion of TNCH lands from this critical habitat designation will help the Service maintain and improve this partnership by formally recognizing the positive contributions of TNCH to plant recovery, and by streamlining or reducing redundant regulatory oversight.

The need for the State's cooperation is also especially acute because the upper Hanawi NAR is unoccupied by *Cyanea mceldowneyi.* Future conservation efforts, such as translocation of this plant species back into unoccupied habitat on this land and expansion of the extant species, will require the cooperation of the State and other non-Federal landowners on Maui. Exclusion of the State's Hanawi NAR lands from this critical habitat designation will help the Service maintain and improve this partnership by formally recognizing the positive contributions of the State NAR to plant recovery, and by streamlining or reducing unnecessary regulatory oversight.

The need for ML&P's cooperation is necessary because future conservation efforts, such as expansion of the extant species, will require the cooperation of ML&P and other non-Federal landowners on Maui. Exclusion of ML&P lands from this critical habitat designation will help the Service maintain and improve this partnership by formally recognizing the positive contributions of ML&P to plant recovery, and by streamlining or reducing unnecessary regulatory oversight.

The need for Ulupalakua Ranch's cooperation is important because the proposed unit Maui H is unoccupied by 3 of the 12 species. Future conservation efforts, such as translocation of these three plant species back into unoccupied habitat on these lands, will require the cooperation of Ulupalakua Ranch.

The need for Haleakala Ranch Co.'s cooperation is especially acute because the proposed units Maui H, I1, I2, and I4 are unoccupied by 11 of the 18 species. Future conservation efforts,

such as reintroduction of these 11 plant species back into unoccupied habitat on these lands, will require the cooperation of Haleakala Ranch Co.

(iii) The Service believes the additional regulatory and educational benefits of including these lands as critical habitat are relatively small. The current partnership agreements between TNCH and many organizations, the State and many organizations, ML&P and many organizations, and current agreements between the Service and Ulupalakua Ranch and Haleakala Ranch already provide significant conservation and educational benefits.

The designation of critical habitat can serve to educate the general public as well as conservation organizations regarding the potential conservation value of an area, but this goal is already being accomplished through the identification of this area in the management plans described above and through public outreach efforts. Likewise, there will be little additional Federal regulatory benefit to the species because (a) there is a low likelihood that these proposed critical habitat units will be negatively affected to any significant degree by Federal activities requiring section 7 consultation, and (b) on land owned by TNCH, the State, Ulupalakua and Haleakala Ranches, and ML&P much of the areas are already occupied by listed species and a section 7 nexus already exists. The Service is unable to identify any other potential benefits associated with critical habitat for these proposed units.

(iv) It is documented that publicly and privately owned lands and lands owned by conservation organizations such as these, alone, are too small and poorly distributed to provide for the conservation of most listed species (Bean 2002, Crouse *et al.* 2002). Excluding these lands from critical habitat may, by way of example, provide positive social, legal, and economic incentives to other non-Federal landowners on Maui who own lands that could contribute to listed species recovery if voluntary conservation measures on these lands are implemented (Norton 2000, Main *et al.* 1999, Shogren *et al.* 1999, Wilcove and Chen 1998). As resources allow, the Service would be willing to consider future revisions or amendments to this final critical habitat rule if landowners affected by this rule develop conservation programs or partnerships (*e.g.*, Habitat Conservation Plans, Safe Harbor Agreements, conservation agreements, etc.) on their lands that outweigh the regulatory and educational benefits of a critical habitat designation.

As described above, the overall benefits to these species of a critical habitat designation for these areas are relatively small. In contrast, we believe that this exclusion will enhance our existing partnership with each landowner and it will set a positive example and provide positive incentives to other non-Federal landowners who may be considering implementing voluntary conservation activities on their lands. There is a higher likelihood of beneficial conservation activities occurring in these and other areas of Maui without designated critical habitat than there would be with designated critical habitat in these areas. In conclusion, we find that the designation of critical habitat on the TNCH Maui preserves, the State's Hawaii upper Hanawi NAR, ML&P's Kukui WMA, the Ulupalakua Ranch portion of proposed unit Maui H, and the Haleakala Ranch portion of proposed units Maui H, I1, I2, and I4 would most likely have a negative effect on the recovery and conservation of the Maui plant species concerned. Therefore, the Service's conclusion is that the net benefits of excluding these areas from critical habitat outweigh the benefits of including these areas.

(4) Exclusion of This Unit Will Not Cause Extinction of the Species

In considering whether or not exclusion of the TNCH preserve lands might result in the extinction of any of the 16 reported species, the Service first considered the impacts to the five species endemic to Maui (*Argyroxiphium sandwicense* ssp. *macrocephalum, Geranium arboreum, Geranium multiflorum, Melicope balloui,* and *Remya mauiensis*).

For both the five endemic and the 11 ''multi-island'' species, it is the Service's conclusion that the TNCH's mission and management plans will provide as much or more net conservation benefits as would be provided if these preserves were designated as critical habitat. These management plans, which are described above, will provide tangible proactive conservation benefits that will reduce the likelihood of extinction for the listed plants in these areas of Maui and increase their likelihood of recovery. Extinction for any of these species as a consequence of this exclusion is unlikely because there are no known threats in these preserves due to any current or reasonably anticipated Federal actions that might be regulated under section 7 of the Act. The DEA indicates that there may be future programmatic consultations. These management actions were designed to protect and provide for the conservation of these species and will not create any threats or risks of extinction to these species. Further, these areas are already occupied by 13 of the 16 species and thereby benefit from the section 7 protections of the Act, should such an unlikely Federal threat actually materialize. The exclusion of these preserves will not increase the risk of extinction to any of these species, and it may increase the likelihood that these species will recover by encouraging other landowners to implement voluntary conservation activities as TNCH has done.

In addition, critical habitat is being designated on other areas of Maui for all five of the endemic species (9—*Argyroxiphium sandwicense* ssp. *macrocephalum*—a, Maui 9—*Geranium arboreum*—a, Maui 14—*Geranium arboreum*—b, Maui 15—*Geranium arboreum*—c, Maui 8—*Geranium multiflorum*—a, Maui 9—*Geranium multiflorum*—b, Maui 9—*Geranium multiflorum*—c, Maui 8—*Melicope balloui*—a, Maui 9—*Melicope balloui*—b, Maui 17—*Remya mauiensis*—a, Maui 17—*Remya mauiensis*—b, Maui 17—*Remya mauiensis*—c, and Maui 18—*Remya mauiensis*—d), and critical habitat has been designated elsewhere on Maui, and proposed or designated on other islands for the remaining 11 multi-island species consistent with the guidance in recovery plans. These other designations identify conservation areas for the maintenance and expansion of the existing populations and are sufficient to prevent extinction of the species concerned.

In considering whether or not exclusion of the State's upper Hanawi NAR might result in the extinction of *Clermontia samuelii, Cyanea mceldowneyi,* and *Geranium multiflorum* the Service considered potential impacts. For all three endemic species, it is the Service's conclusion that the State's NAR mission and management provide a significant conservation benefit. The management will provide tangible proactive conservation benefits that will reduce the likelihood of extinction for the listed plants in this area of Maui and increase their likelihood of recovery. Extinction for any of these species as a consequence of this exclusion is unlikely because there are no known threats in the NAR due to any current or reasonably anticipated Federal actions that might be regulated under section 7 of the Act. Further, this area is already occupied by two of the three species and thereby benefits from the section 7 protections of the Act, should such an unlikely Federal threat actually

materialize. The exclusion of this NAR will not increase the risk of extinction to any of these species, and it may increase the likelihood these species will recover by encouraging other landowners to implement voluntary conservation activities as the State has done.

In addition, critical habitat is being designated on another area of Maui for all three endemic species (Maui 9—*Clermontia samuelii*—a, Maui 8—*Cyanea mceldowneyi*—a, Maui 8—*Geranium multiflorum*—a, Maui 9—*Geranium multiflorum*—b, and Maui 9—*Geranium multiflorum*—c). These other designations identify conservation areas for the maintenance and expansion of the existing populations.

In considering whether or not exclusion of the Puu Kukui WMA might result in the extinction of any of the eight species, the Service first considered the impacts to the Maui endemic, *Hesperomannia arborescens.*

For both the endemic *Hesperomannia arborescens* and the seven ''multi-island'' species, it is the Service's conclusion that ML&P's mission and management programs will provide as much or more net conservation benefits as would be provided if this area was designated as critical habitat. These management programs, which are described above, will provide tangible proactive conservation benefits that will reduce the likelihood of extinction for the listed plants in these areas of Maui and increase their likelihood of recovery. Extinction for any of these species as a consequence of this exclusion is unlikely because there are no known threats in Puu Kukui WMA due to any current or reasonably anticipated Federal actions that might be regulated under section 7 of the Act. Further, this area is already occupied by all of the eight species and thereby benefit from the section 7 protections of the Act, should such an unlikely Federal threat actually materialize. The exclusion of Puu Kukui WMA will not increase the risk of extinction to any of these species, and it may increase the likelihood these species will recover by encouraging other landowners to implement voluntary conservation activities as ML&P has done.

In addition, critical habitat has been designated elsewhere on Maui, and proposed or designated on other islands for the remaining seven multi-island species consistent with the guidance in recovery plans. These other designations identify conservation areas for the maintenance and expansion of the existing populations.

In considering whether or not exclusion of Ulupalakua Ranch's proposed unit Maui H might result in the extinction of any of the 12 species, the Service first considered the impacts to the three species endemic to Maui (*Geranium arboreum, Lipochaeta kamolensis,* and *Melicope adscendens*), and second to the nine species known from Maui and one or more other Hawaiian islands.

For both the three endemic and the nine ''multi-island'' species, it is the Service's conclusion that the partnership agreements developed by Ulupalakua Ranch and the Service will provide more net conservation benefits than would be provided by designating the portion of proposed unit Maui H as critical habitat. These agreements, which are described above, will provide tangible proactive conservation benefits that will reduce the likelihood of extinction for the listed plants in this area of Maui and increase their likelihood of recovery. Extinction for any of these species as a consequence of this exclusion is unlikely because there are no known threats in this portion of proposed unit Maui H due to any current or reasonably anticipated Federal actions that might be regulated under section 7 of the Act. Implementation of the partnership agreements between the landowner and the Service and the exclusion of the portion of proposed unit Maui H have the highest likelihood of preventing extinction of these 12 species, especially the species endemic to the island of Maui.

In addition, critical habitat is being designated on another area of Maui for all three of the endemic species (Maui 9—*Geranium arboreum*—a, Maui 9—*Lipochaeta kamolensis*—a, and Maui 13—*Melicope adscendens*—a). These other designations identify conservation areas for the maintenance and expansion of the existing populations.

In considering whether or not exclusion of Haleakala Ranch Company's portions of proposed units Maui H, I1, I2, and I4 might result in the extinction of any of the 18 species, the Service first considered the impacts to the six species endemic to Maui (*Argyroxiphium sandwicense* ssp. *macrocephalum, Cyanea mceldowneyi, Geranium arboreum, Geranium multiflorum, Lipochaeta kamolensis,* and *Melicope balloui*), and second to the 12 species known from Maui and one or more other Hawaiian islands.

For both the six endemic and the 12 ''multi-island'' species, it is the Service's conclusion that the partnership agreements developed by Haleakala Ranch and the Service will provide more net conservation benefits than would be provided by designating the portion of proposed units H, I1, I2, and I4 as critical habitat. These agreements, which are described above, will provide tangible proactive conservation benefits that will reduce the likelihood of extinction for the listed plants in this area of Maui and increase their likelihood of recovery. Extinction for any of these species as a consequence of this exclusion is unlikely because there are no known threats in these portions of proposed units Maui H, I1, I2, and I4 due to any current or reasonably anticipated Federal actions that might be regulated under section 7 of the Act. Implementation of the partnership agreements between the landowner and the Service, and the exclusion of the portion of proposed units Maui H, I1, I2, and I4, have the highest likelihood of preventing extinction of these 18 species, especially the species endemic to the island of Maui.

In addition, critical habitat is being designated on other areas of Maui for all six of the endemic species (Maui 9—*Argyroxiphium sandwicense* ssp. *macrocephalum*—a, Maui 8—*Cyanea mceldowneyi*—a, Maui 9—*Geranium arboreum*—a, Maui 14—*Geranium arboreum*—b, Maui 14—*Geranium arboreum*—c, Maui 8—*Geranium multiflorum*—a, Maui 8—*Geranium multiflorum*—b, Maui 9—*Geranium multiflorum*—c, Maui 9—*Lipochaeta kamolensis*—a, Maui 8—*Melicope balloui*—a, and Maui 8—*Melicope balloui*—b), and critical habitat has been designated elsewhere on Maui, and proposed or designated on other islands for the remaining 12 multi-island species consistent with the guidance in the recovery plans for these species. These other designations identify conservation areas for the maintenance and expansion of the existing populations.

In addition, § 195D–4 (Hawaii Revised Statutes, Endangered species and threatened species) stipulates that species determined to be endangered or threatened under the Federal ESA shall be deemed endangered or threatened under the state law. It is unlawful under the state law, with some exceptions, to ''take'' such species, or to possess, sell, carry or transport them. For plants, take is defined in the State statute as to ''cut, collect, uproot, destroy, injure, or possess''. The statutory protections for these plants provide additional assurances that exclusion of these areas from critical habitat will not result in extinction of the species in question.

In sum, the above analysis concludes that an exclusion of these areas from final critical habitat on Maui will have a net beneficial impact with little risk of

negative impacts. Therefore the exclusion of these lands will not cause extinction and should in fact improve the chance of recovery for *Alectryon macrococcus, Argyroxiphium sandwicense* ssp. *macrocephalum, Asplenium fragile* var. *insulare, Bonamia menziesii, Cenchrus agrimonioides, Clermontia lindseyana, Clermontia oblongifolia* ssp. *mauiensis, Clermontia samuelii, Colubrina oppositifolia, Ctenitis squamigera, Cyanea glabra, Cyanea lobata, Cyanea mceldowneyi, Cyrtandra munroi, Diellia erecta, Diplazium molokaiense, Flueggea neowawraea, Geranium arboreum, Geranium multiflorum, Hesperomannia arborescens, Lipochaeta kamolensis, Melicope adscendens, Melicope balloui, Melicope knudsenii, Melicope mucronulata, Neraudia sericea, Phlegmariurus mannii, Phyllostegia mannii, Phyllostegia mollis, Plantago princeps, Platanthera holochila, Remya mauiensis,* and *Sanicula purpurea.*

Taxonomic Changes

At the time we listed *Clermontia peleana*, *Cyanea grimesiana* ssp. *grimesiana*, *Cyanea lobata*, *Delissea undulata*, *Mariscus pennatiformis*, *Phyllostegia parviflora*, and *Phyllostegia mollis*, we followed the taxonomic treatments in Wagner *et al.* (1990), the widely used and accepted *Manual of the Flowering Plants of Hawaii*. For *Phlegmariurus mannii*, we used the ''Revised Checklist of Hawaiian Pteridophytes'' (Wagner and Wagner 1994). Subsequent to the final listing, we became aware of new taxonomic treatments of these species. Also, in the recently published *Hawaii's Ferns and Fern Allies* (Plamer 2003), the family name for *Ctenitis squamigera* has changed (from Aspleniaceae to Dryopteridaceae). Due to the court-ordered deadlines, we are required to publish this final rule to designate critical habitat on Maui and Kahoolawe before we can prepare and publish a notice of taxonomic changes for these nine species. We plan to publish a taxonomic change notice for these nine species after we have published the final critical habitat designations on Maui and Kahoolawe.

Required Determinations

Regulatory Planning and Review

In accordance with Executive Order 12866, the Office of Management and Budget (OMB) has determined that this critical habitat designation is not a significant regulatory action. This rule will not have an annual economic effect of $100 million or more or adversely affect any economic sector, productivity, competition, jobs, the environment, or other units of government. This designation will not create inconsistencies with other agencies' actions or otherwise interfere with an action taken or planned by another agency. It will not materially affect entitlements, grants, user fees, loan programs, or the rights and obligations of their recipients. Finally, this designation will not raise novel legal or policy issues. Accordingly, OMB has not formally reviewed this final critical habitat designation.

Regulatory Flexibility Act

Under the Regulatory Flexibility Act (RFA) (as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996), whenever a Federal agency is required to publish a notice of rulemaking for any proposed or final rule, it must prepare and make available for public comment a regulatory flexibility analysis that describes the effect of the rule on small entities (*i.e.,* small businesses, small organizations, and small governmental jurisdictions). However, no regulatory flexibility analysis is required if the head of the agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. SBREFA amended the RFA to require Federal agencies to provide a statement of the factual basis for certifying that a rule will not have a significant economic impact on a substantial number of small entities.

Based on the information in our economic analysis (draft economic analysis, supplement, and addendum), we are certifying that the critical habitat designation for 60 Maui and Kahoolawe plant species will not have a significant effect on a substantial number of small entities because a substantial number of small entities are not affected by the designation.

SBREFA does not explicitly define either ''substantial number'' or ''significant economic impact.'' Consequently, to assess whether a ''substantial number'' of small entities is affected by this designation, this analysis considers the relative number of small entities likely to be impacted in the area. Similarly, this analysis considers the relative cost of compliance on the revenues/profit margins of small entities in determining whether or not entities incur a ''significant economic impact.'' Federal courts and Congress have indicated that an RFA/SBREFA analysis should be limited to all impacts to entities directly subject to the requirements of the regulation (*See Mid-Tex Electric Co-Op, Inc.* v. *F.E.R.C.* and *America Trucking Associations, Inc.* v. *EPA.*). As such, entities indirectly impacted by the plant listings and critical habitat and, therefore, not directly regulated by the listing or critical habitat designation are not considered in this section of the analysis.

Small entities include small organizations, such as independent non-profit organizations, and small governmental jurisdictions, such as school boards and city and town governments that serve fewer than 50,000 residents, as well as small businesses. Refer to the draft economic analysis for a further discussion of the definition of small entities.

The RFA/SBREFA defines ''small governmental jurisdiction'' as the government of a city, county, town, school district with a population of less than 50,000. By this definition, Federal government agencies are not small business under SBA guidelines, and State agencies are not considered small governments under the RFA. The County of Maui is also not a small governmental jurisdiction because its population was approximately 128,240 in 2000.

SBREFA further defines ''small organization'' as any not-for-profit enterprise that is independently owned and operated and is not dominant in its field. The East Maui Watershed Partnership and the West Maui Watershed Partnership are not independently owned but are public-private partnerships between Federal agencies, State agencies, private landowners, and community organizations that are dominant in setting policy for watershed protection. While the definition of ''small organization'' leaves some room for interpretation, based on the above factors, the economic analysis does not consider either partnership to be a ''small organization.'' Our draft economic analysis further identified one other organization that may be affected by the critical habitat designation on Maui, although, to this point, we have never consulted with them directly or indirectly, as Hawaii Television Broadcasters Association (HTBA). The HTBA is a Hawaii nonprofit corporation that represents the common interests of Hawaii's television broadcasters, each of which has annual revenues in excess of $750,000. As the entity representing all the local broadcast stations, HTBA appears to be dominant in its field and therefore does not appear to meet SBREFA's definition of a ''small organization.''

The RFA/SBREFA requires that agencies use the SBA's definition of ''small business,'' which is codified at 13 CFR 121.201. The draft economic analysis identified the following small businesses. Zond Pond, a company formed to develop wind projects in Hawaii that have not yet been constructed, and several livestock operations. Zond Pond currently has no sales by which to evaluate whether it meets the definition of a small business. However, our DEA concluded, based on a public declaration from Zond Pond that it is not a small business and the projected scale of its windfarm projects, that Zond Pond does not qualify as a ''small business'' under SBA's small business definitions. In 2000, there were 170 cattle livestock operations in Maui County. The combined cattle sales of all of these operations in 2000 was about $3.2 millions (Statistics of Hawaii Agriculture, 2000). Since this implies average annual cattles sales per business of $19,000, it is likely that all of almost all of the Maui County cattle operations meet the definition of a small business (annual sales less thant $750,000).

To determine if the rule would affect a substantial number of small entities, we consider the number of small entities affected within particular types of economic activities (*e.g.*, housing development, grazing, oil and gas production, timber harvesting, etc.) in this particular area/market affected by the regulation. We apply the ''substantial number'' test individually to each industry to determine if certification is appropriate. In estimating the numbers of small entities potentially affected, we also consider whether their activities have any Federal involvement. Some kinds of activities are unlikely to have any Federal involvement, and so will not be affected by critical habitat designation.

The primary projects and activities that might be affected by the designation and could affect small entities include ranching operations in Maui County. The economic analysis predicts that between zero and two section 7 consultations will be conducted over the next 10 years on ranches in Maui County. The economic analysis estimates that these consultations may affect one to four businesses out of 170 (1 to two percent) of the small businesses in the cattle industry in Maui County. (This is an overestimate of the number of businesses potentially affected because it is based on more consultations occurring than is currently estimated.)

The entire island of Kahoolawe is under State ownership and within the State Conservation District. The current and projected land uses on Kahoolawe are land restoration and ordnance removal (Decision Analysts Hawaii (DAHI) 2001). For these reasons, the draft economic analysis concluded that the proposed rule would not affect a substantial number of small entities on the island of Kahoolawe. Based on the above analysis, a significant economic impact on a substantial number of small entities will not result from the proposed critical habitat designation on Maui and Kahoolawe.

This conclusion are supported by the history of consultations on Maui. Since these 60 plant species were listed (between 1991 and 1999), on the island of Maui we have conducted only one formal consultation and 16 informal consultations, in addition to consultations on Federal grants to State wildlife programs, which do not affect small entities. Three informal consultations were conducted with the U.S. Air Force, for the Maui Space Surveillance Site, who requested we review their final draft ''Environmental Assessment, ''Integrated Natural Resources Management Plan for the Maui Space Surveillance Complex,'' and the effects of the construction of the surveillance site on listed and proposed endangered and threatened species. Three informal consultations were conducted with Haleakala National Park, regarding a collecting permit for two of the 60 species, *Geranium arboreum* and *Geranium multiflorum*, and we reviewed the ''Environmental Assessment for Replacement of the Summit Comfort Station and Utilities Systems' and a park highway resurfacing project. One informal consultation was conducted with the Service's Ecological Services Program for the effects of fencing and replanting on listed endangered and threatened species within the Auwahi Partnership Project area. One informal consultation was conducted with the Service's Ecological Services Program for the effects of fencing and hunting on listed endangered and threatened species within the Kahikinui Partnership Project area. One informal consultation was conducted with the Service's Ecological Services Program, for the effects of fencing and outplanting on listed endangered and threatened species within the Puu Makua Partnership Project area. One informal consultation was conducted with the Service for the effects of ungulate exclusion on listed endangered and threatened species within the Puu Kukui Partnership Project area. One informal consultation was conducted with the Department of Defense for review of the effects of the Kanaio National Guard Training Area on listed endangered and threatened species and review of ''Natural Resources Management Plan: Kanaio Guard Training Area.'' Two informal consultations were conducted with the Department of Transportation for review of the effects of the proposed Kihei-Upcountry Highway on listed endangered and threatened species. One informal consultations was conducted with the U.S. Department of Agriculture for review of the effect of feral pig removal on listed endangered and threatened species within Waikamoi and Kapunakea Preserves. One informal consultation was conducted with the Service's Ecological Services Program for the effects of fencing and replanting listed endangered and threatened species within the Puu O Kali restoration area. One informal consultation was conducted with NRCS for the effects of ranching operations on listed endangered and threatened species within 38 acres of private land. One formal consultation was conducted with the Federal Aviation Administration (FAA) for the review of the ''Final Environmental Impact Statement, Kahului Airport Improvements.''

None of these consultations affected or concerned small entities. In all 16 informal consultations, we concurred with each agency's determination that the project, as proposed, was not likely to adversely affect listed species. For the formal consultation, we determined that the airport improvement project, which included a mandatory state-of-the-art alien species interdiction facility, was not likely to jeopardize listed species nor adversely affect designated critical habitat for *Gouania hillebrandii* on the island of Maui. In addition, only the FAA's proposed airport improvement project is ongoing. The FAA is not a small entity. Therefore, the requirement to reinitiate consultation for ongoing projects will not affect a substantial number of small entities on Maui.

There has been one informal consultation on the island of Kahoolawe. The consultation was conducted on behalf of the Department of the Navy for the effects of ordnance cleanup on listed endangered and threatened species. The Department of the Navy is not a small entity; therefore this consultation did not affect or concern small entities. In this case, we concurred with the agency's determination that the project as proposed was not likely to adversely affect listed species. Although this project is ongoing, it does not affect nor concern small entities, so the

requirement to reinitiate consultation for ongoing projects will not affect a substantial number of small entities on Kahoolawe.

In addition, on Maui, nearly all of the land within the critical habitat units is unsuitable for development, land uses, and activities. This is due to their remote locations, lack of access, and rugged terrain. Approximately 86 percent of this land, and all of the land on Kahoolawe, is within the State Conservation District where State land-use controls severely limit development and most activities, and approximately 14 percent of this land is within the State Agricultural District.

Even where the requirements of section 7 might apply due to critical habitat, based on our experience with section 7 consultations for all listed species, virtually all projects—including those that, in their initial proposed form, would result in jeopardy or adverse modification determinations under section 7—can be implemented successfully with, at most, the adoption of reasonable and prudent alternatives. These measures by definition must be economically feasible and within the scope of authority of the Federal agency involved in the consultation.

For these reasons, we are certifying that the designation of critical habitat for *Alectryon macrococcus, Argyroxiphium sandwicense* ssp. *macrocephalum, Asplenium fragile* var. *insulare, Bidens micrantha* ssp. *kalealaha, Bonamia menziesii, Brighamia rockii, 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, Gouania vitifolia, Hedyotis coriacea, Hedyotis mannii, Hesperomannia arbuscula, Hibiscus brackenridgei, Ischaemum byrone, Isodendrion pyrifolium, Kanaloa kahoolawensis, Lipochaeta kamolensis, Lysimachia lydgatei, Mariscus pennatiformis, Melicope adscendens, Melicope balloui, Melicope knudsenii, Melicope mucronulata, Melicope ovalis, Neraudia sericea, Nototrichium humile, Peucedanum sandwicense, Phlegmariurus mannii, Phyllostegia mannii, Phyllostegia mollis, Plantago princeps, Platanthera holochila, Pteris lidgatei, Remya mauiensis, Sanicula purpurea, Schiedea haleakalensis, Sesbania tomentosa, Spermolepis hawaiiensis, Tetramolopium capillare, Tetramolopium remyi, Vigna o-wahuensis,* and *Zanthoxylum hawaiiense* will not have a significant economic impact on a substantial number of small entities. Therefore, a regulatory flexibility analysis is not required.

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

Under the Small Business Regulatory Enforcement Fairness Act (5 U.S.C. 801 *et seq.*), this rule is not a major rule. Our detailed assessment of the economic effects of this designation are described in the draft economic analysis, the final addendum and the supplement to the economic analysis. Based on the effects identified in these documents, we believe that this rule will not have an effect on the economy of $100 million or more per year, will not cause a major increase in costs or prices for consumers, and will not have significant adverse effects on competition, employment, investment, productivity, innovation, or the ability of U.S.-based enterprises to compete with foreign-based enterprises. Refer to the final addendum to the economic analysis for a discussion of the effects of this determination.

Executive Order 13211

On May 18, 2001, the President issued Executive Order 13211, on regulations that significantly affect energy supply, distribution, and use. Executive Order 13211 requires agencies to prepare Statements of Energy Effects when undertaking certain actions. According to OMB, this rule is not a significant regulatory action under Executive Order 12866, and we do not expect to significantly affect energy production supply and distribution facilities because no significant energy production, supply, and distribution facilities are included within designated critical habitat. Further, for the reasons described in the economic analysis, we do not believe that designation of critical habitat for the 60 species on Maui and Kahoolawe will affect future energy production. Therefore, this action is not a significant energy action, and no Statement of Energy Effects is required.

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

In accordance with the Unfunded Mandates Reform Act (2 U.S.C. 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 not be affected unless they propose an action requiring Federal funds, permits, or other authorizations. Any such activities will require that the Federal agency ensure that the action will not adversely modify or destroy designated critical habitat.

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

Takings

In accordance with Executive Order 12630 (''Government Actions and Interference with Constitutionally Protected Private Property Rights''), we have analyzed the potential takings implications of designating critical habitat for the 60 species from Maui and Kahoolawe in a takings implications assessment. The takings implications assessment concludes that this final rule does not pose significant takings implications.

Federalism

In accordance with Executive Order 13132, this final rule does not have significant Federalism effects. A Federalism assessment is not required. In keeping with Department of Interior policy, we requested information from appropriate State agencies in Hawaii. This rule imposes no regulatory requirements unless an agency is seeking Federal funding or authorization, so it does not have Federal implications. In addition, this rule will not have substantial direct compliance costs because many of the planned projects that could affect critical habitat have no Federal involvement.

The designations may have some benefit to these governments, in that the areas essential to the conservation of these species are more clearly defined and the primary constituent elements of the habitat necessary to the survival of the species are specifically identified. While this definition and identification does not alter where and what federally sponsored activities may occur, it may assist these local governments in long-range planning, rather than waiting for case-by-case section 7 consultation to occur.

Civil Justice Reform

In accordance with Executive Order 12988, the Department of the Interiors's Office of the Solicitor has determined that this rule does not unduly burden the judicial system and does meet the requirements of sections 3(a) and 3(b)(2) of the Order. We have designated 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 60 plant species from Maui and Kahoolawe.

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. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a valid OMB control number.

National Environmental Policy Act

We have determined that we do not need to prepare an Environmental Assessment and/or an Environmental Impact Statement as defined by the National Environmental Policy Act of 1969 in connection with regulations adopted pursuant to section 4(a) of the Endangered Species Act. We published a notice outlining our reason for this determination in the **Federal Register** on October 25, 1983 (48 FR 49244). This determination does not constitute a major Federal action significantly affecting the quality of the human environment.

Government-to-Government Relationship with Tribes

In accordance with the President's memorandum of April 29, 1994, ''Government-to-Government Relations with Native American Tribal Governments'' (59 FR 22951), Executive Order 13175, and the Department of the Interior's manual at 512 DM 2, we readily acknowledge our responsibility to communicate meaningfully with recognized Federal Tribes on a government-to-government basis. We have determined that there are no Tribal lands essential for the conservation of these 60 plant species. Therefore, designation of critical habitat for these 60 species does not involve any Tribal lands.

References Cited

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

Authors

The primary authors of this final rule are staff of the Pacific Islands Fish and Wildlife Office (*see* **ADDRESSES** section).

List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Reporting and recordkeeping requirements, Transportation.

Regulation Promulgation

■ Accordingly, we hereby 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. Amend § 17.12(h), the List of Endangered and Threatened Plants, as set forth below:

■ a. Under the table's heading FLOWERING PLANTS, by revising the entries for *Alectryon macrococcus, Argyroxiphium sandwicense* ssp. *macrocephalum, Bidens micrantha* ssp. *kalealaha, Bonamia menziesii, Brighamia rockii, 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, Gouania vitifolia, Hedyotis coriacea, Hedyotis mannii, Hesperomannia arbuscula, Hibiscus brackenridgei, Ischaemum byrone, Isodendrion pyrifolium, Kanaloa kahoolawensis, Lipochaeta kamolensis, Lysimachia lydgatei, Mariscus pennatiformis, Melicope adscendens, Melicope balloui, Melicope knudsenii, Melicope mucronulata, Melicope ovalis, Neraudia sericea, Nototrichium humile, Peucedanum sandwicense, Phyllostegia mannii, Phyllostegia mollis, Plantago princeps, Platanthera holochila, Remya mauiensis, Sanicula purpurea, Schiedea haleakalensis, Sesbania tomentosa, Spermolepis hawaiiensis, Tetramolopium capillare, Tetramolopium remyi, Vigna o-wahuensis,* and *Zanthoxylum hawaiiense* to read as follows: and

■ b. Under the table's heading FERNS AND ALLIES, by revising the entries for *Asplenium fragile* var. *insulare, Ctenitis squamigera, Diellia erecta, Diplazium molokaiense,* and *Pteris lidgatei;* by removing the entry for *Huperzia* (=*Phlegmariurus,* =*Lycopodium*) *mannii;* and by adding an entry for *Phlegmariurus* (=*Lycopodum,* =*Huperzia*) *mannii* to read as follows.

§ 17.12 Endangered and threatened plants.

* * * * *

(h) * * *

Species		Historic range	Family	Status	When listed	Critical habitat	Special rules
Scientific name	Common name						
FLOWERING PLANTS							
*	*	*	*	*	*	*	
Alectryon macrococcus	Mahoe	U.S.A. (HI)	Sapindaceae	E	467	17.99(a)(1), (c) and (e)(1).	NA
*	*	*	*	*	*	*	
Argyroxiphium sandwicense ssp. *macrocephalum.*	Ahinahina	U.S.A. (HI)	Asteraceae	T	467	17.99(e)(1)	NA
*	*	*	*	*	*	*	
Bidens micrantha ssp. *kalealaha*	Kookoolau	U.S.A. (HI)	Asteraceae	E	467	17.96(b) and 17.99(e)(1).	NA
*	*	*	*	*	*	*	
Bonamia menziesii	None	U.S.A. (HI)	Convolvulaceae	E	559	17.99(a)(1) and (e)(1)	NA
*	*	*	*	*	*	*	
Brighamia rockii	Pua ala	U.S.A. (HI)	Campanulaceae	E	480	17.99(c) and (e)(1)	NA
*	*	*	*	*	*	*	
Cenchrus agrimonioides	Kamanomano	U.S.A. (HI)	Poaceae	E	592	17.99(e)(1)	NA

Species		Historic range	Family	Status	When listed	Critical habitat	Special rules
Scientific name	Common name						
(=Sandbur, agrimony)							
*	*	*	*	*	*	*	
Centaurium sebaeoides	Awiwi	U.S.A. (HI)	Gentianaceae	E	448	17.99(a)(1), (c) and (e)(1).	NA
*	*	*	*	*	*	*	
Clermontia lindseyana	Oha wai	U.S.A. (HI)	Campanulaceae	E	532	17.99(e)(1)	NA
*	*	*	*	*	*	*	
Clermontia oblongifolia ssp. *mauiensis*	Oha wai	U.S.A. (HI)	Campanulaceae	E	467	17.99(e)(1)	NA
*	*	*	*	*	*	*	
Clermontia samuelii	Oha wai	U.S.A. (HI)	Campanulaceae	E	666	17.99(e)(1)	NA
*	*	*	*	*	*	*	
Colubrina oppositifolia	Kauila	U.S.A. (HI)	Rhamnaceae	E	532	17.99(e)(1)	NA
*	*	*	*	*	*	*	
Cyanea copelandii ssp. *haleakalaensis*	Haha	U.S.A. (HI)	Campanulaceae	E	666	17.99(e)(1)	NA
*	*	*	*	*	*	*	
Cyanea glabra	Haha	U.S.A. (HI)	Campanulaceae	E	666	17.99(e)(1)	NA
*	*	*	*	*	*	*	
Cyanea grimesiana ssp. *grimesiana*	Haha	U.S.A. (HI)	Campanulaceae	E	592	17.99(c) and (e)(1)	NA
*	*	*	*	*	*	*	
Cyanea hamatiflora ssp. *hamatiflora*	Haha	U.S.A. (HI)	Campanulaceae	E	666	17.99(e)(1)	NA
*	*	*	*	*	*	*	
Cyanea lobata	Haha	U.S.A. (HI)	Campanulaceae	E	467	17.99(e)(1)	NA
*	*	*	*	*	*	*	
Cyanea mceldowneyi	Haha	U.S.A. (HI)	Campanulaceae	E	467	17.99(e)(1)	NA
*	*	*	*	*	*	*	
Cyrtandra munroi	Haiwale	U.S.A. (HI)	Gesneriaceae	E	467	17.99(e)(1)	NA
*	*	*	*	*	*	*	
Dubautia plantaginea ssp. *humilis*	Naenae	U.S.A. (HI)	Asteraceae	E	666	17.99(e)(1)	NA
*	*	*	*	*	*	*	
Flueggea neowawraea	Mehamehame	U.S.A. (HI)	Euphorbiaceae	E	559	17.99(a)(1), (c), and (e)(1).	NA
*	*	*	*	*	*	*	
Geranium arboreum	Hawaiian red-flowered geranium.	U.S.A. (HI)	Geraniaceae	E	465	17.99(e)(1)	NA
*	*	*	*	*	*	*	
Geranium multiflorum	Nohoanu	U.S.A. (HI)	Geraniaceae	E	467	17.99(e)(1)	NA
*	*	*	*	*	*	*	
Gouania vitifolia	None	U.S.A. (HI)	Rhamnaceae	E	541	17.99(e)(1)	NA
*	*	*	*	*	*	*	
Hedyotis coriacea	Kioele	U.S.A. (HI)	Rubiaceae	E	467	17.99(e)(1)	NA
*	*	*	*	*	*	*	
Hedyotis mannii	Pilo	U.S.A. (HI)	Rubiaceae	E	480	17.99(e)(1)	NA
*	*	*	*	*	*	*	
Hesperomannia arbuscula	None	U.S.A. (HI)	Asteraceae	E	448	17.99(e)(1)	NA
*	*	*	*	*	*	*	
Hibiscus brackenridgei	Mao hau hele	U.S.A. (HI)	Malvaceae	E	559	17.99(c) and (e)(1)	NA
*	*	*	*	*	*	*	
Ischaemum byrone	Hilo ischaemum	U.S.A. (HI)	Poaceae	E	532	17.99(a)(1), (c), and (e)(1).	NA
*	*	*	*	*	*	*	
Isodendrion pyrifolium	Wahine noho kula	U.S.A. (HI)	Violaceae	E	532	17.99(c) and (e)(1)	NA
*	*	*	*	*	*	*	
Kanaloa kahoolawensis	Kohe malama malama o kanaloa.	U.S.A. (HI)	Fabaceae	E	666	17.99(e)(2)	NA
*	*	*	*	*	*	*	
Lipochaeta kamolensis	Nehe	U.S.A. (HI)	Asteraceae	E	467	17.99(e)(1)	NA
*	*	*	*	*	*	*	
Lysimachia lydgatei	None	U.S.A. (HI)	Primulaceae	E	467	17.99(e)(1)	NA
*	*	*	*	*	*	*	
Mariscus pennatiformis	None	U.S.A. (HI)	Cyperaceae	E	559	17.99(a)(1) and (e)(1)	NA
*	*	*	*	*	*	*	
Melicope adscendens	Alani	U.S.A. (HI)	Rutaceae	E	565	17.99(e)(1)	NA
*	*	*	*	*	*	*	
Melicope balloui	Alani	U.S.A. (HI)	Rutaceae	E	565	17.99(e)(1)	NA
*	*	*	*	*	*	*	
Melicope knudsenii	Alani	U.S.A. (HI)	Rutaceae	E	530	17.99(a)(1) and (e)(1)	NA
*	*	*	*	*	*	*	
Melicope mucronulata	Alani	U.S.A. (HI)	Rutaceae	E	467	17.99(c) and (e)(1)	NA
*	*	*	*	*	*	*	
Melicope ovalis	Alani	U.S.A. (HI)	Rutaceae	E	565	17.99(e)(1)	NA
*	*	*	*	*	*	*	
Neraudia sericea	None	U.S.A. (HI)	Urticaceae	E	559	17.99(c) and (e)(1)	NA
*	*	*	*	*	*	*	
Nototrichium humile	Kului	U.S.A. (HI)	Amaranthaceae	E	448	17.99(e)(1)	NA
*	*	*	*	*	*	*	
Peucedanum sandwicense	Makou	U.S.A. (HI)	Apiaceae	T	530	17.99(a)(1), (c), and (e)(1).	NA
*	*	*	*	*	*	*	
Phyllostegia mannii	None	U.S.A. (HI)	Lamiaceae	E	480	17.99(c) and (e)(1)	NA

Species		Historic range	Family	Status	When listed	Critical habitat	Special rules
Scientific name	Common name						
*	*	*	*	*	*	*	
Phyllostegia mollis	None	U.S.A. (HI)	Lamiaceae	E	448	17.99(e)(1)	NA
*	*	*	*	*	*	*	
Plantago princeps	Laukahi kuahiwi	U.S.A. (HI)	Plantaginaceae	E	559	17.99(a)(1), (c), and (e)(1).	NA
*	*	*	*	*	*	*	
Platanthera holochila	None	U.S.A. (HI)	Orchidaceae	E	592	17.99(a)(1) and (e)(1)	NA
*	*	*	*	*	*	*	
Remya mauiensis	Maui remya	U.S.A. (HI)	Asteraceae	E	413	17.99(e)(1)	NA
*	*	*	*	*	*	*	
Sanicula purpurea	None	U.S.A. (HI)	Apiaceae	E	592	17.99(e)(1)	NA
*	*	*	*	*	*	*	
Schiedea haleakalensis	None	U.S.A. (HI)	Caryophyllaceae	E	467	17.99(e)(1)	NA
*	*	*	*	*	*	*	
Sesbania tomentosa	Ohai	U.S.A. (HI)	Fabaceae	E	559	17.99(a)(1), (c), and (e)(1).	NA
*	*	*	*	*	*	*	
Spermolepis hawaiiensis	None	U.S.A. (HI)	Apiaceae	E	559	17.99(a)(1), (c), and (e)(1).	NA
*	*	*	*	*	*	*	
Tetramolopium capillare	Pamakani	U.S.A. (HI)	Asteraceae	E	555	17.99(e)(1)	NA
*	*	*	*	*	*	*	
Tetramolopium remyi	None	U.S.A. (HI)	Asteraceae	E	435	17.96(b) and 17.99(e)(1).	NA
*	*	*	*	*	*	*	
Vigna o-wahuensis	None	U.S.A. (HI)	Fabaceae	E	559	17.99(e)(1)	NA
Zanthoxylum hawaiiense	Ae	U.S.A. (HI)	Rutaceae	E	532	17.99(a)(1), (c), and (e)(1).	NA
*	*	*	*	*	*	*	
FERNS AND ALLIES							
Asplenium fragile var. *insulare*	None	U.S.A. (HI)	Aspleniaceae	E	553	17.99(e)(1)	NA
*	*	*	*	*	*	*	
Ctenitis squamigera	Pauoa	U.S.A. (HI)	Aspleniaceae	E	553	17.99(a)(1), (c), and (e)(1).	NA
*	*	*	*	*	*	*	
Diellia erecta	Asplenium-leaved diellia.	U.S.A. (HI)	Aspleniaceae	E	559	17.99(a)(1), (c), and (e)(1).	NA
*	*	*	*	*	*	*	
Diplazium molokaiense	None	U.S.A. (HI)	Aspleniaceae	E	553	17.99(a)(1), (c), and (e)(1).	NA
*	*	*	*	*	*	*	
Phlegmariurus (=*Lycopodium*,=*Huperzia*) *mannii*.	Wawaeiole	U.S.A. (HI)	Lycopodiaceae	E	467	17.99(e)(1)	NA
*	*	*	*	*	*	*	
Pteris lidgatei	None	U.S.A. (HI)	Adiantaceae	E	553	17.99(c) and (e)(1)	NA

■ 3. Amend § 17.99 as set forth below:
■ a. By revising the section heading to read as follows: and
■ b. By adding paragraphs (e) and (f) to read as follows:

§ 17.99 Critical habitat; plants on the islands of Kauai, Niihau, Molokai, Maui and Kahoolawe, HI.

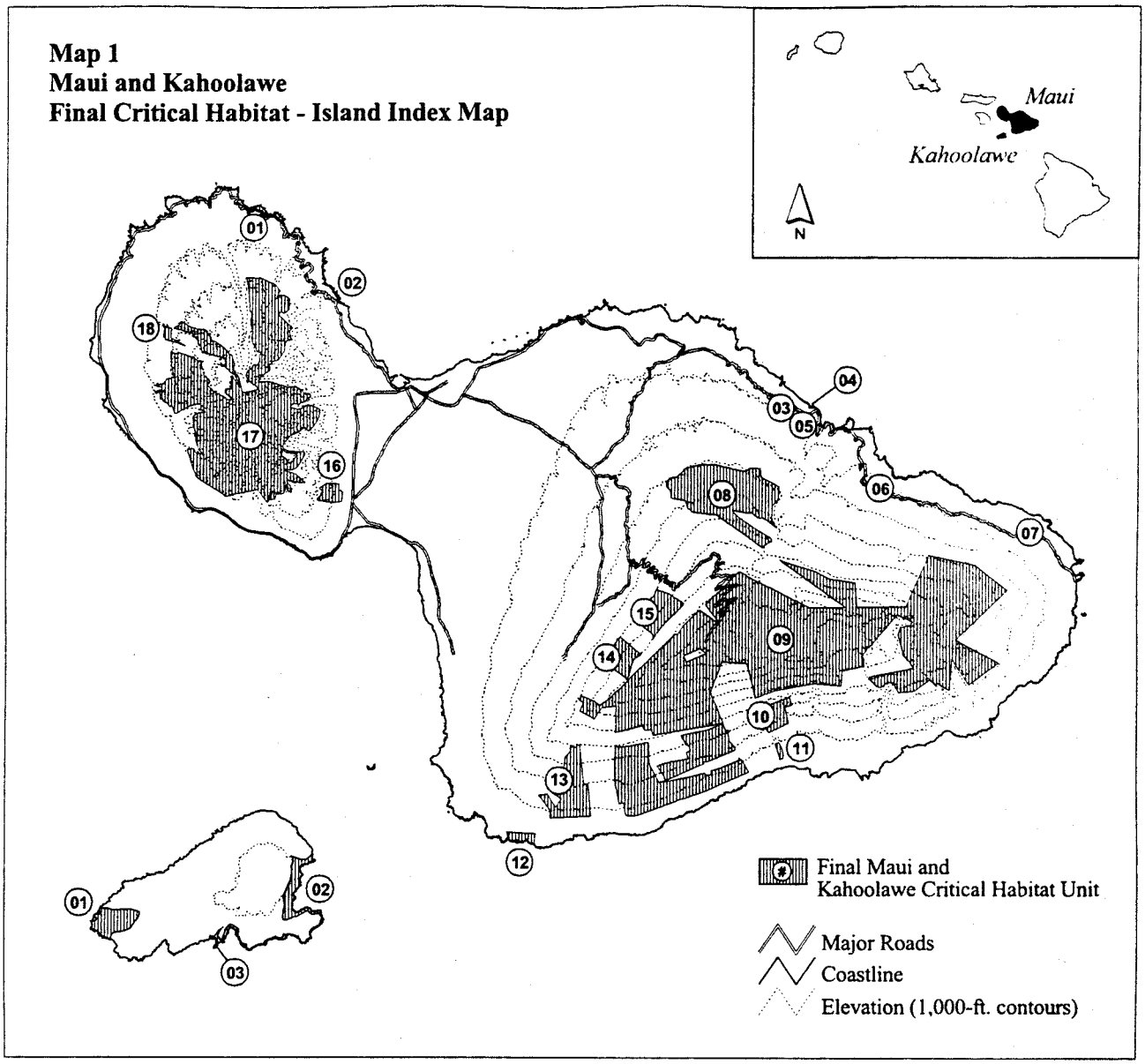
* * * * *

(e) *Maps and critical habitat unit descriptions for the islands of Maui and Kahoolawe, HI.* The following sections contain the legal descriptions of the critical habitat units designated for the islands of Maui and Kahoolawe, HI. Existing manmade features and structures within the boundaries of the mapped areas, such as buildings; roads; aqueducts and other water system features—including but not limited to pumping stations, irrigation ditches, pipelines, siphons, tunnels, water tanks, gaging stations, intakes, reservoirs, diversions, flumes, and wells; existing trails; campgrounds and their immediate surrounding landscaped area; scenic lookouts; remote helicopter landing sites; existing fences; telecommunications towers and associated structures and equipment; electrical transmission lines and distribution, and communication facilities and regularly maintained associated rights-of-way and access ways; radars and telemetry antennas; missile launch sites; arboreta and gardens; heiau (indigenous places of worship or shrines) and other archaeological sites; airports; other paved areas; and lawns and other rural residential landscaped areas do not contain the primary constituent elements described for each species in paragraph (f) of this section, except for the elevation primary constituent element, and therefore are not included in the critical habitat designations.

(1) *Maui.* Critical habitat units are described below. Coordinates in UTM Zone 4 with units in meters using North American Datum of 1983 (NAD83). The following map shows the general locations of the 136 critical habitat units designated on the island of Maui.

(i) **Note:** Map 1—Index map—follows:

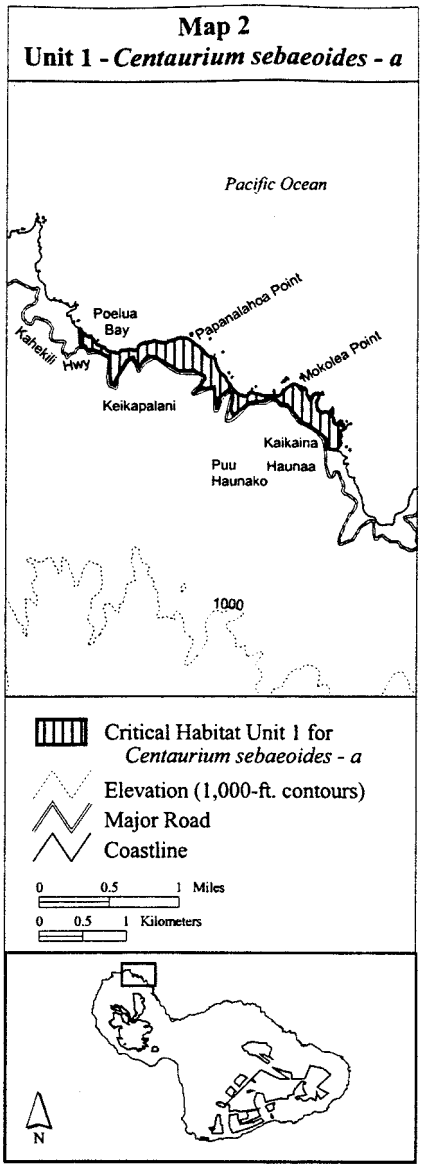
BILLING CODE 4310–55–P



(ii) Maui 1—*Centaurium sebaeoides*—a (71 ha; 174 ac).

(A) Unit consists of the following 93 boundary points and the intermediate coastline: Start at 751112, 2326166; 754099, 2324756; 754053, 2324754; 754053, 2324754; 753973, 2324765; 753966, 2324891; 753771, 2325042; 753692, 2325076; 753669, 2325092; 753524, 2325277; 753446, 2325286; 753446, 2325286; 753388, 2325342; 753388, 2325342; 753381, 2325348; 753372, 2325347; 753367, 2325346; 753332, 2325352; 753325, 2325353; 753299, 2325342; 753270, 2325329; 753238, 2325323; 753221, 2325320; 753189, 2325314; 753085, 2325303; 753085, 2325303; 753085, 2325303; 753077, 2325294; 753069, 2325293; 752894, 2325153; 752865, 2325227; 752886, 2325361; 752884, 2325378; 752893, 2325419; 752878, 2325426; 752833, 2325446; 752831, 2325447; 752829, 2325444; 752827, 2325442; 752732, 2325363; 752732, 2325363; 752732, 2325363; 752725, 2325288; 752717, 2325268; 752711, 2325276; 752692, 2325301; 752671, 2325491; 752670, 2325500; 752591, 2325471; 752535, 2325474; 752535, 2325474; 752535, 2325474; 752475, 2325438; 752566, 2325581; 752580, 2325602; 752559, 2325613; 752455, 2325669; 752444, 2325674; 752441, 2325676; 752268, 2325670; 751992, 2325839; 751990, 2325840; 751898, 2325842; 751835, 2325769; 751804, 2325709; 751734, 2325826; 751730, 2325834; 751715, 2325826; 751714, 2325826; 751713, 2325825; 751653, 2325794; 751526, 2325562; 751530, 2325511; 751525, 2325510; 751492, 2325530; 751475, 2325549; 751475, 2325549; 751461, 2325680; 751461, 2325835; 751461, 2325837; 751461, 2325837; 751461, 2325837; 751273, 2325927; 751251, 2325921; 751218, 2325911; 751187, 2325954; 751173, 2325973; 751154, 2325968; 751123, 2325981; 751122, 2325980; 751117, 2326075; 751115, 2326111; 751112, 2326166; return to starting point.

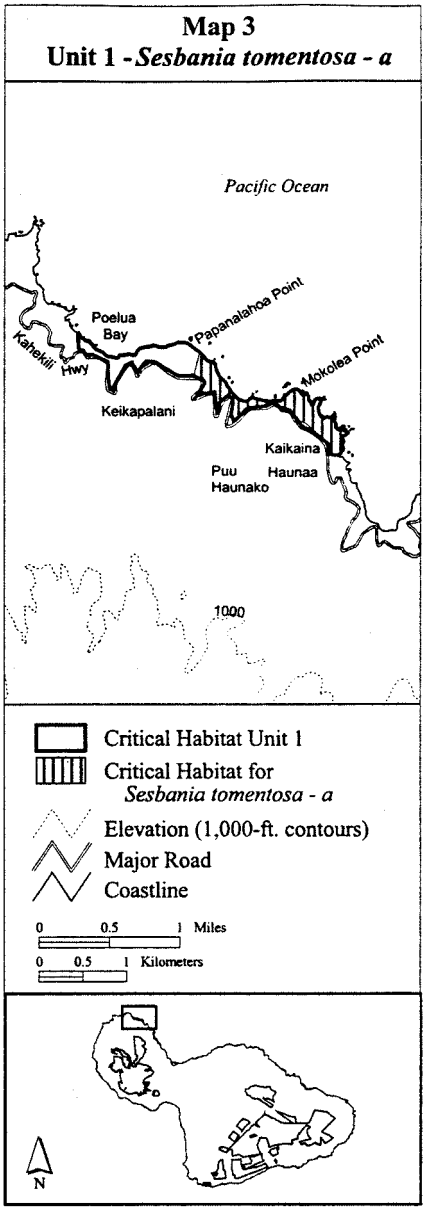
(B) **Note:** Map 2 follows:



(iii) Maui 1—*Sesbania tomentosa*—a (38 ha; 94 ac).

(A) Unit consists of the following 54 boundary points and the intermediate coastline: Start at 752505, 2325951; 754099, 2324756; 754053, 2324754; 754053, 2324754; 753994, 2324762; 753966, 2324896; 753718, 2325117; 753656, 2325144; 753550, 2325285; 753389, 2325341; 753388, 2325342; 753384, 2325343; 753372, 2325347; 753346, 2325356; 753332, 2325352; 753332, 2325352; 753325, 2325353; 753300, 2325342; 753299, 2325342; 753238, 2325323; 753231, 2325321; 753221, 2325320; 753036, 2325303; 752894, 2325153; 752865, 2325227; 752886, 2325361; 752882, 2325396; 752886, 2325418; 752878, 2325426; 752850, 2325454; 752833, 2325446; 752829, 2325444; 752753, 2325409; 752739, 2325369; 752739, 2325369; 752732, 2325363; 752730, 2325339; 752708, 2325279; 752708, 2325280; 752700, 2325498; 752671, 2325491; 752593, 2325471; 752535, 2325474; 752535, 2325474; 752487, 2325446; 752567, 2325578; 752566, 2325581; 752559, 2325613; 752549, 2325657; 752455, 2325669; 752443, 2325670; 752444, 2325674; 752504, 2325951; 752505, 2325951; return to starting point.

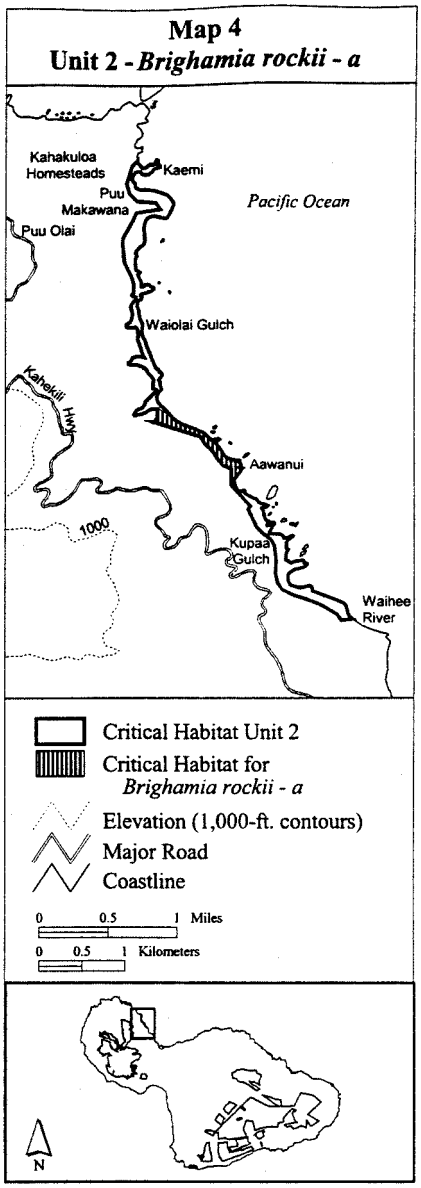
(B) **Note:** Map 3 follows:



(iv) Maui 2—*Brighamia rockii*—a (6 ha; 14 ac).

(A) Unit consists of the following 29 boundary points and the intermediate coastline: Start at 757892, 2319612; 757868, 2319613; 757861, 2319624; 757862, 2319690; 757862, 2319690; 757794, 2319720; 757771, 2319757; 757765, 2319756; 757726, 2319818; 757700, 2319852; 757688, 2319868; 757645, 2319908; 757645, 2319908; 757626, 2319942; 757626, 2319942; 757371, 2320024; 757371, 2320024; 757333, 2320052; 757268, 2320058; 757266, 2320058; 757272, 2320064; 757278, 2320070; 757288, 2320086; 757296, 2320107; 757292, 2320137; 757312, 2320161; 757387, 2320119; 757388, 2320120; 757892, 2319612; return to starting point.

(B) **Note:** Map 4 follows:

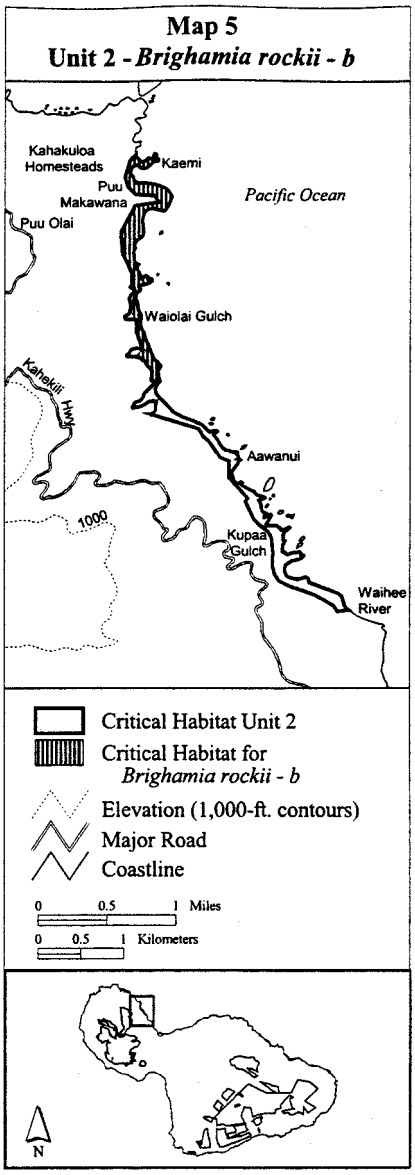


(v) Maui 2—*Brighamia rockii*—b (17 ha; 42 ac).

(A) Unit consists of the following 47 boundary points and the intermediate coastline: Start at 757133, 2322103; 757301, 2320290; 757290, 2320310; 757286, 2320313; 757279, 2320318; 757264, 2320330; 757264, 2320389; 757248, 2320415; 757247, 2320416; 757241, 2320425; 757211, 2320467;

757209, 2320469; 757193, 2320485; 757174, 2320504; 757148, 2320525; 757157, 2320542; 757190, 2320563; 757188, 2320568; 757183, 2320582; 757167, 2320630; 757140, 2320705; 757145, 2320746; 757139, 2320784; 757137, 2320794; 757102, 2320856; 757102, 2320918; 757125, 2321030; 757126, 2321037; 757127, 2321042; 757107, 2321136; 757104, 2321149; 757082, 2321207; 757031, 2321316; 757019, 2321449; 757019, 2321491; 757069, 2321583; 757108, 2321658; 757109, 2321661; 757127, 2321696; 757312, 2321727; 757278, 2321778; 757132, 2321784; 757073, 2321843; 757052, 2321922; 757086, 2322052; 757133, 2322103; 757133, 2322103; return to starting point.

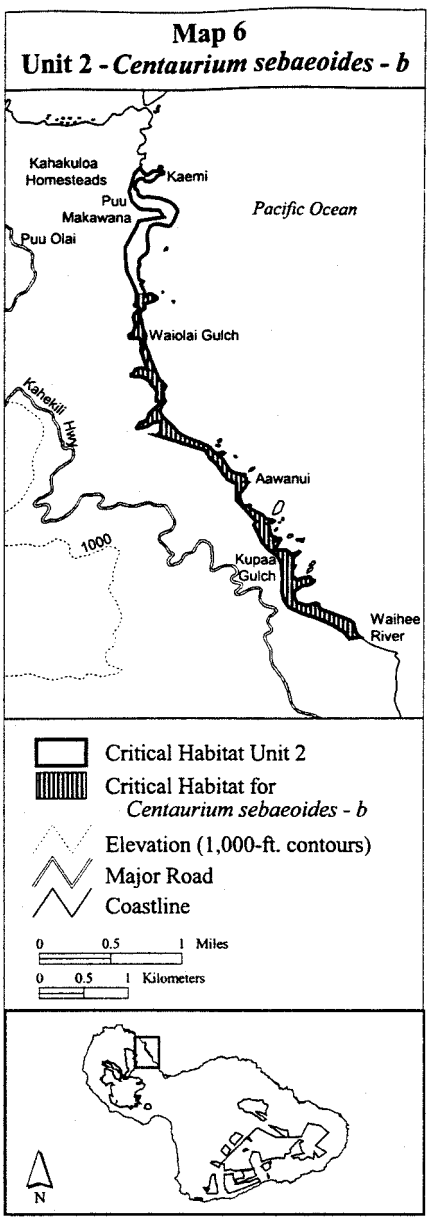
(B) **Note:** Map 5 follows:



(vi) Maui 2—*Centaurium sebaeoides*—b (27 ha; 66 ac).

(A) Unit consists of the following 106 boundary points and the intermediate coastline: Start at 757167, 2321145; 758803, 2318519; 758719, 2318510; 758683, 2318554; 758580, 2318620; 758534, 2318638; 758445, 2318673; 758344, 2318706; 758258, 2318748; 758224, 2318802; 758205, 2318870; 758210, 2318971; 758198, 2319087; 758172, 2319133; 758100, 2319189; 758059, 2319236; 757995, 2319372; 758013, 2319396; 758013, 2319396; 758013, 2319396; 757861, 2319563; 757861, 2319624; 757862, 2319690; 757794, 2319720; 757771, 2319757; 757727, 2319831; 757700, 2319852; 757658, 2319885; 757645, 2319908; 757626, 2319942; 757371, 2320024; 757267, 2320057; 757268, 2320058; 757272, 2320064; 757287, 2320085; 757291, 2320139; 757294, 2320164; 757273, 2320164; 757242, 2320158; 757201, 2320133; 757176, 2320121; 757115, 2320110; 757111, 2320116; 757132, 2320151; 757173, 2320169; 757193, 2320192; 757198, 2320217; 757211, 2320231; 757274, 2320293; 757290, 2320303; 757286, 2320313; 757285, 2320316; 757279, 2320318; 757259, 2320326; 757259, 2320339; 757260, 2320395; 757247, 2320416; 757243, 2320423; 757241, 2320425; 757213, 2320452; 757209, 2320469; 757205, 2320484; 757193, 2320485; 757184, 2320485; 757169, 2320504; 757152, 2320502; 757143, 2320509; 757089, 2320510; 757068, 2320516; 757067, 2320526; 757083, 2320535; 757093, 2320554; 757100, 2320567; 757138, 2320580; 757188, 2320568; 757191, 2320567; 757183, 2320582; 757171, 2320606; 757168, 2320622; 757167, 2320630; 757156, 2320685; 757142, 2320706; 757148, 2320745; 757139, 2320784; 757136, 2320795; 757126, 2320807; 757087, 2320802; 757054, 2320808; 757050, 2320822; 757051, 2320829; 757079, 2320846; 757094, 2320878; 757098, 2320909; 757087, 2320942; 757083, 2320967; 757092, 2320990; 757125, 2321030; 757127, 2321033; 757126, 2321037; 757124, 2321043; 757096, 2321047; 757094, 2321055; 757103, 2321074; 757107, 2321136; 757107, 2321139; 757167, 2321145; return to starting point.

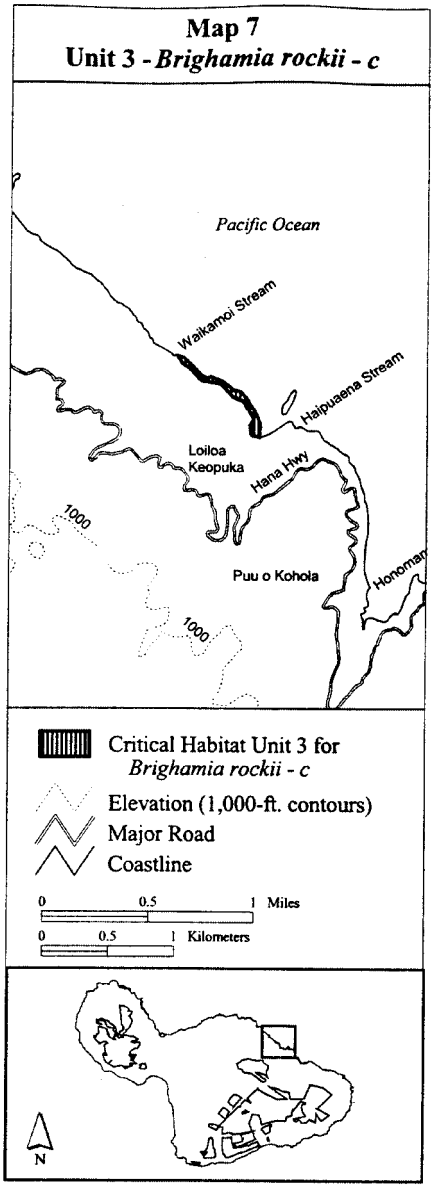
(B) **Note:** Map 6 follows:



(vii) Maui 3—*Brighamia rockii*—c (4 ha; 9 ac).

(A) Unit consists of the following 31 boundary points and the intermediate coastline: Start at 793379, 2311347; 793988, 2310722; 793937, 2310735; 793921, 2310750; 793918, 2310815; 793926, 2310829; 793943, 2310864; 793938, 2310875; 793940, 2310881; 793940, 2310881; 793940, 2310881; 793940, 2310881; 793931, 2310894; 793906, 2310935; 793885, 2310962; 793883, 2310973; 793856, 2311001; 793796, 2311026; 793781, 2311037; 793781, 2311037; 793768, 2311053; 793690, 2311134; 793635, 2311144; 793569, 2311152; 793544, 2311158; 793534, 2311167; 793459, 2311247; 793399, 2311287; 793362, 2311345; 793379, 2311347; return to starting point.

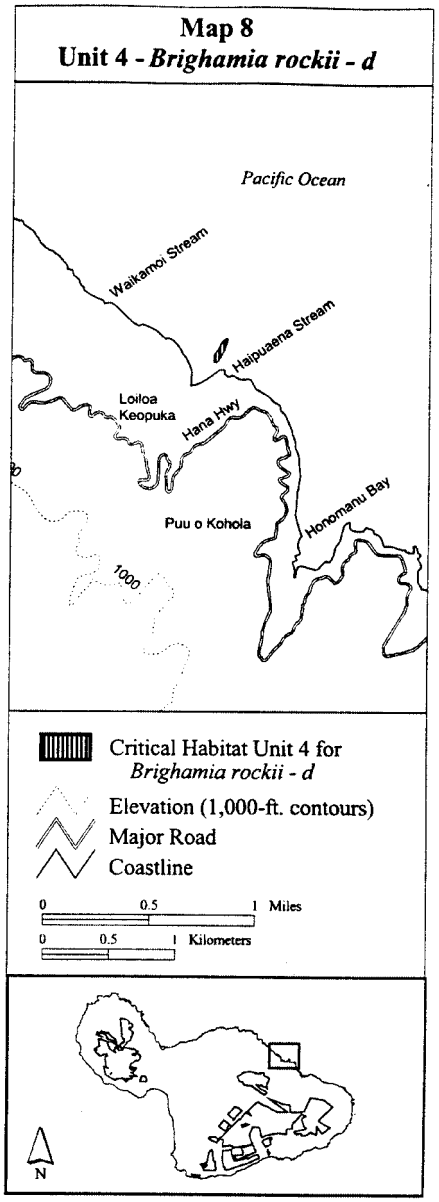
(B) **Note:** Map 7 follows:



(viii) Maui 4—*Brighamia rockii*—d (1 ha; 2 ac).

(A) Unit consists of the entire offshore island located at approximately: 794212, 2310986.

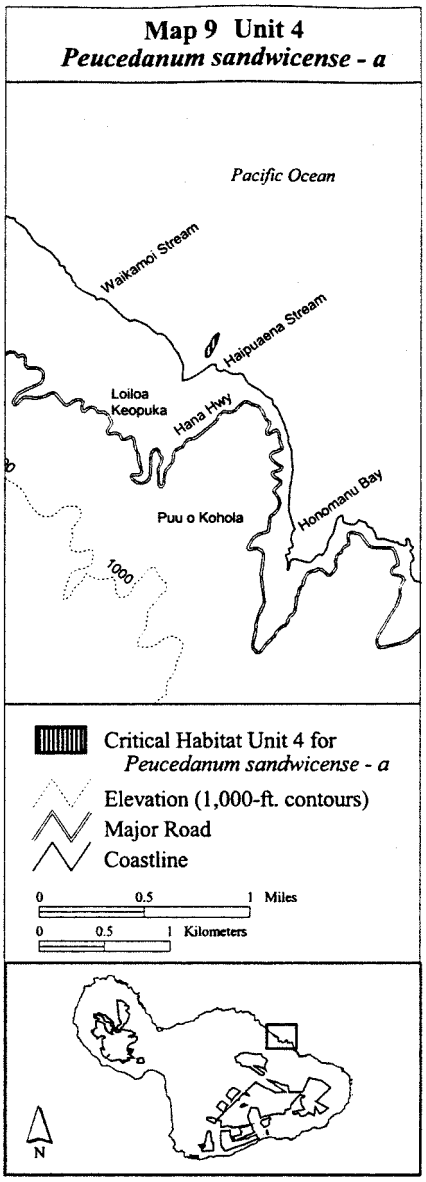
(B) **Note:** Map 8 follows:



(ix) Maui 4—*Peucedanum sandwicense*—a (1 ha; 2 ac).

(A) Unit consists of the entire offshore island located at approximately: 794212, 2310986.

(B) **Note:** Map 9 follows:

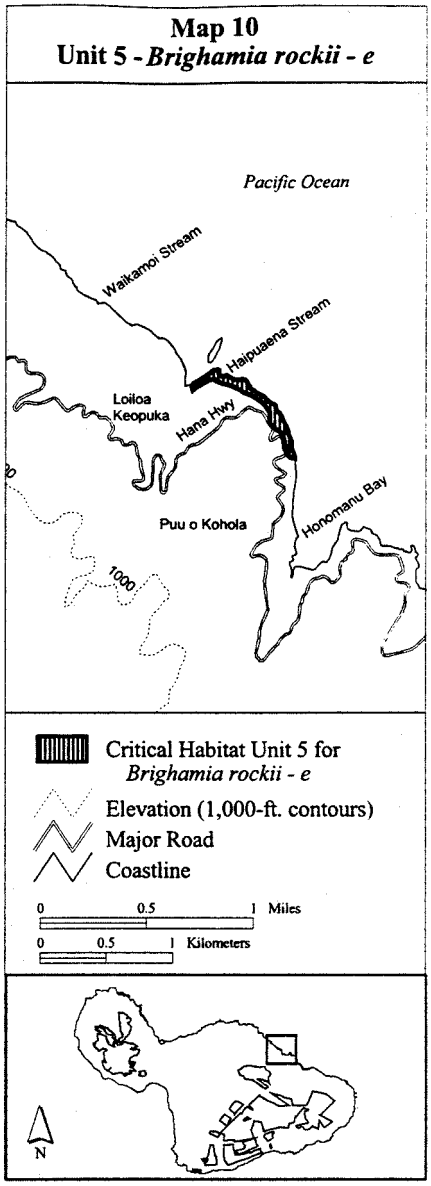


(x) Maui 5—*Brighamia rockii*—e (6 ha; 15 ac).

(A) Unit consists of the following 46 boundary points and the intermediate coastline: Start at 794814, 2310166; 794778, 2310176; 794770, 2310182; 794756, 2310193; 794756, 2310217; 794742, 2310240; 794739, 2310261; 794733, 2310282; 794733, 2310282; 794733, 2310282; 794732, 2310303; 794731, 2310313; 794728, 2310324; 794728, 2310324; 794728, 2310324; 794721, 2310337; 794712, 2310344; 794707, 2310362; 794706, 2310368; 794706, 2310368; 794706, 2310368; 794665, 2310393; 794660, 2310404; 794652, 2310413; 794642, 2310419; 794632, 2310428; 794632, 2310428; 794629, 2310436; 794625, 2310446; 794622, 2310523; 794573, 2310595; 794492, 2310647; 794439, 2310671; 794411, 2310685; 794335, 2310724; 794326, 2310728; 794266, 2310740;

794242, 2310754; 794222, 2310764; 794210, 2310773; 794177, 2310772; 794066, 2310705; 794050, 2310688; 794040, 2310715; 794043, 2310738; 794043, 2310738; return to starting point.

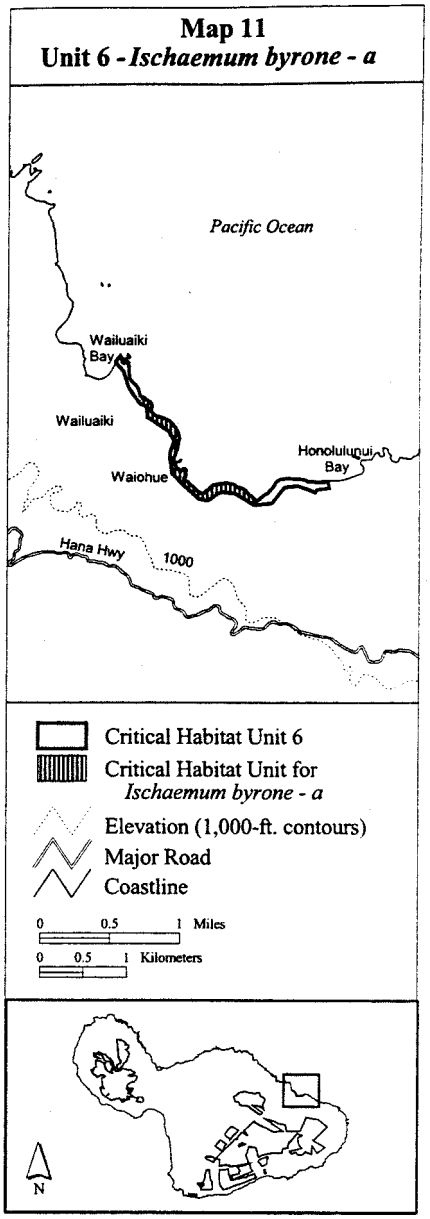
(B) **Note**: Map 10 follows:



(xi) Maui 6—*Ischaemum byrone*—a (17 ha; 43 ac).

(A) Unit consists of the following 34 boundary points and the intermediate coastline: Start at 799822, 2306499; 801132, 2305284; 801131, 2305234; 801117, 2305232; 801048, 2305275; 800891, 2305373; 800731, 2305387; 800581, 2305284; 800517, 2305297; 800481, 2305305; 800472, 2305307; 800472, 2305307; 800265, 2305505; 800166, 2305599; 800166, 2305599; 800166, 2305599; 800159, 2305694; 800147, 2305843; 800147, 2305849; 800147, 2305849; 800190, 2305990; 800138, 2306094; 800138, 2306094; 800060, 2306148; 800001, 2306188; 800001, 2306188; 799917, 2306240; 799879, 2306263; 799874, 2306386; 799796, 2306425; 799795, 2306425; 799795, 2306425; 799795, 2306425; 799822, 2306499; return to starting point.

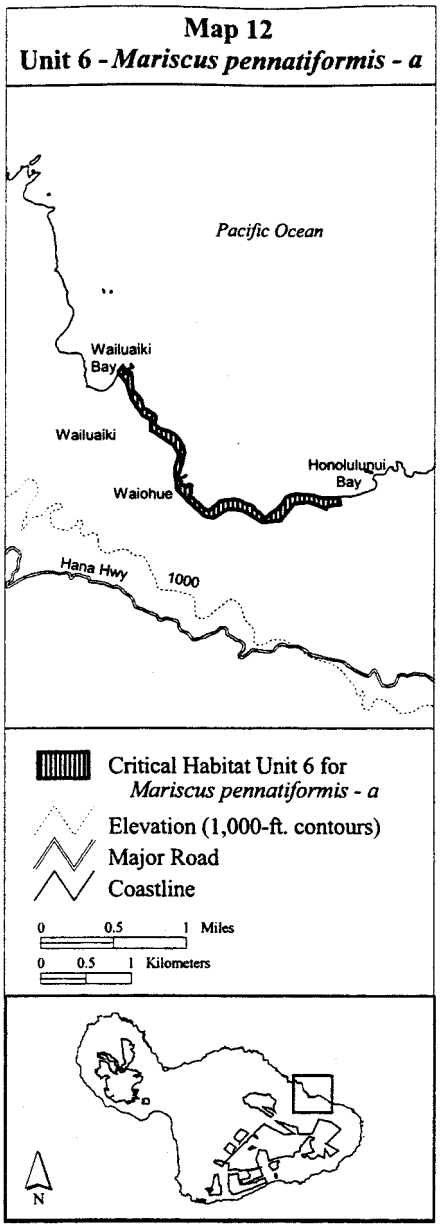
(B) **Note:** Map 11 follows:



(xii) Maui 6—*Mariscus pennatiformis*—a (30 ha; 75 ac).

(A) Unit consists of the following 47 boundary points and the intermediate coastline: Start at 799656, 2306630; 799606, 2306800; 799516, 2306902; 799516, 2306902; 801972, 2305512; 801972, 2305512; 801981, 2305435; 801840, 2305416; 801825, 2305385; 801734, 2305421; 801628, 2305464; 801558, 2305455; 801466, 2305444; 801320, 2305260; 801117, 2305232; 801067, 2305263; 801048, 2305275; 800896, 2305373; 800734, 2305390; 800586, 2305288; 800517, 2305297; 800517, 2305297; 800481, 2305305; 800481, 2305305; 800289, 2305482; 800265, 2305505; 800171, 2305595; 800159, 2305694; 800150, 2305769; 800147, 2305842; 800147, 2305843; 800171, 2305927; 800190, 2305990; 800156, 2306059; 800136, 2306101; 800060, 2306148; 800060, 2306148; 800001, 2306188; 799917, 2306240; 799917, 2306240; 799886, 2306262; 799874, 2306391; 799795, 2306425; 799789, 2306428; 799723, 2306527; 799721, 2306530; 799656, 2306630; return to starting point.

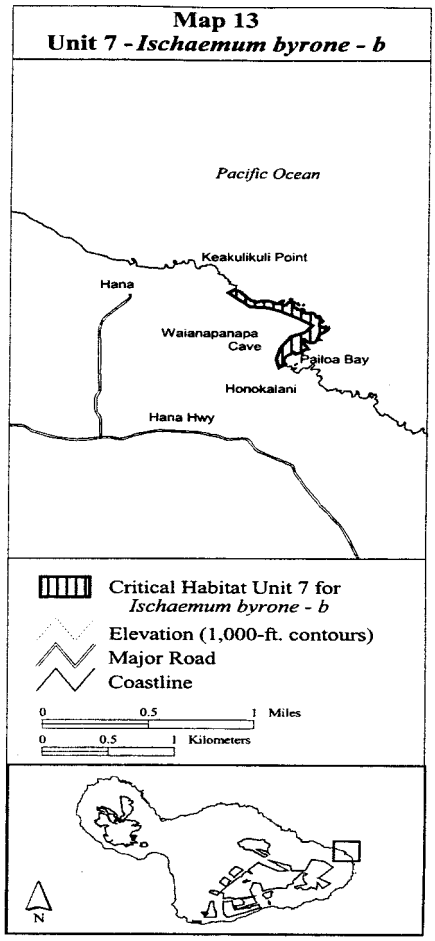
(B) **Note:** Map 12 follows:



(xiii) Maui 7—*Ischaemum byrone*—b (11 ha; 27 ac).

(A) Unit consists of the following 15 boundary points and the intermediate coastline: Start at 811597, 2302341; 811983, 2301617; 811982, 2301617; 811936, 2301585; 811916, 2301671; 811945, 2301774; 812026, 2301885; 812133, 2301927; 812193, 2301995; 812092, 2302061; 811938, 2302135; 811849, 2302164; 811717, 2302172; 811546, 2302307; 811597, 2302341; return to starting point.; return to starting point.

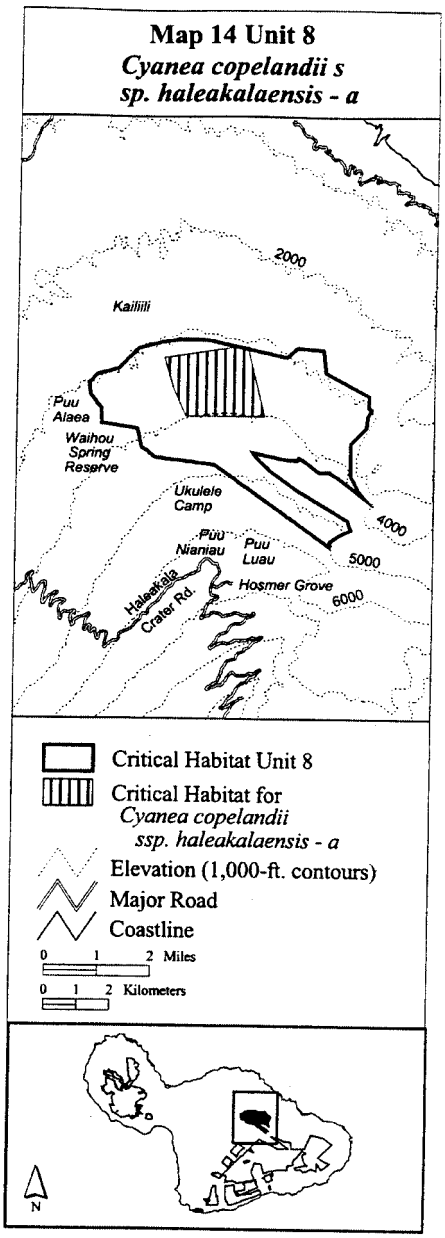
(B) **Note:** Map 13 follows:



(xiv) Maui 8—*Cyanea copelandii* ssp. *haleakalaensis*—a (501 ha; 1,238 ac).

(A) Unit consists of the following 10 boundary points: Start at 787682, 2306203; 787708, 2306208; 787902, 2306166; 787967, 2306151; 788003, 2306143; 788005, 2306134; 788521, 2304072; 786138, 2304072; 785730, 2304957; 785457, 2305842; return to starting point.

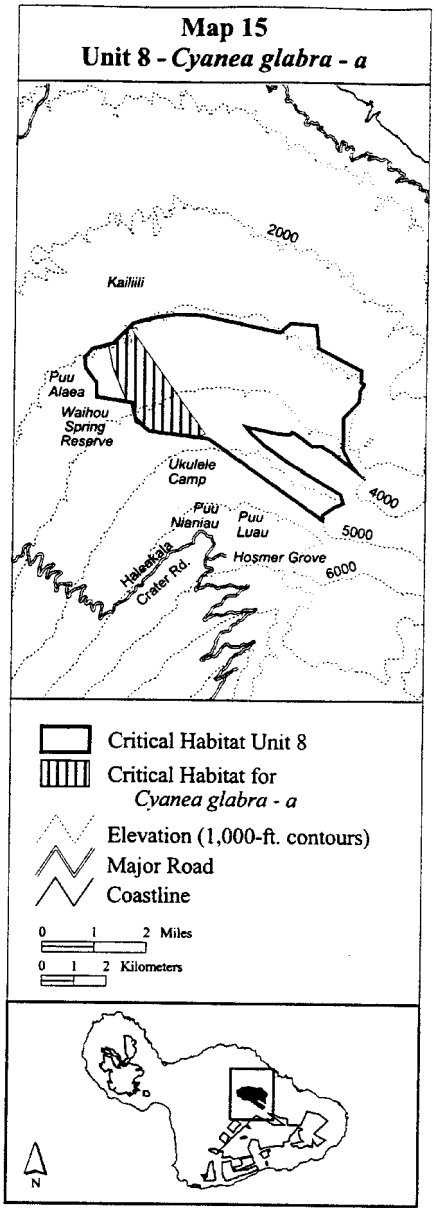
(B) **Note:** Map 14 follows:



(xv) Maui 8—*Cyanea glabra*—a (450 ha; 1,112 ac).

(A) Unit consists of the following 29 boundary points: Start at 783933, 2305472; 783933, 2305473; 783961, 2305480; 784075, 2305511; 784100, 2305536; 784575, 2306024; 784578, 2306020; 786938, 2302713; 786676, 2302611; 786661, 2302613; 786491, 2302633; 786339, 2302653; 786280, 2302660; 786106, 2302680; 786032, 2302690; 785884, 2302707; 785796, 2302718; 785680, 2302732; 785510, 2302753; 785357, 2302772; 785246, 2302785; 785242, 2302786; 785188, 2302835; 784760, 2303276; 784660, 2303678; 784487, 2303704; 784079, 2304760; 784008, 2305132; 783955, 2305292; return to starting point.

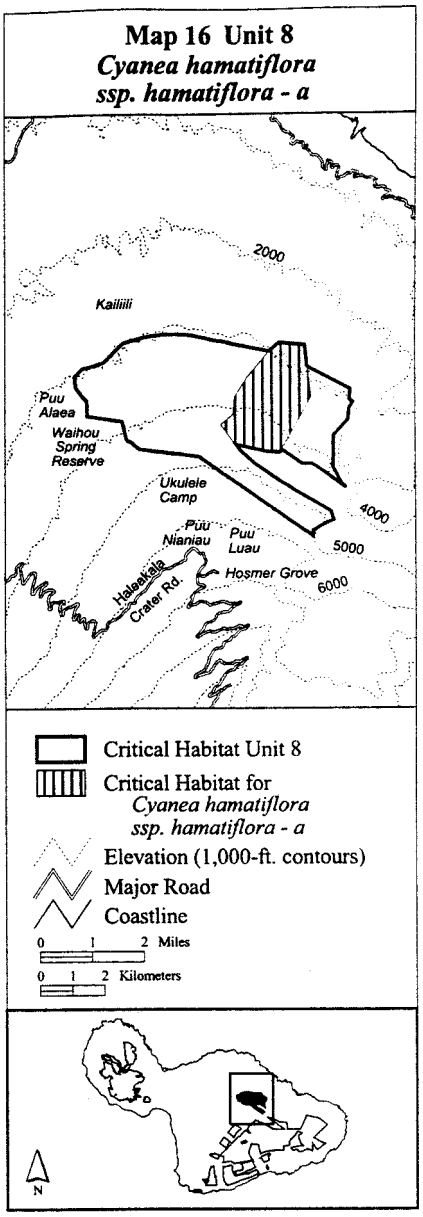
(B) **Note:** Map 15 follows:



(xvi) Maui 8—*Cyanea hamatiflora* ssp. *hamatiflora*—a (611 ha; 1,509 ac).

(A) Unit consists of the following 17 boundary points: Start at 789198, 2305890; 789215, 2305911; 789515, 2306162; 790281, 2306097; 790352, 2305511; 790360, 2305448; 790364, 2305412; 790482, 2304451; 789577, 2302791; 789530, 2302705; 789179, 2302726; 788179, 2302942; 788149, 2302948; 787716, 2303565; 788077, 2303893; 788127, 2304437; 788521, 2305059; return to starting point.

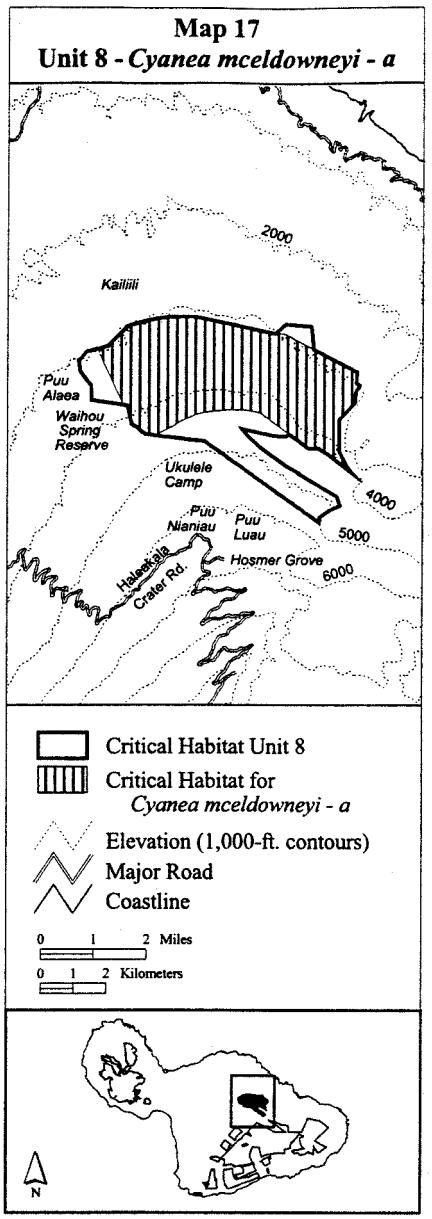
(B) **Note:** Map 16 follows:



(xvii) Maui 8—*Cyanea mceldowneyi*—a (2,127 ha; 5,256 ac).

(A) Unit consists of the following 56 boundary points: Start at 784578, 2306020; 784691, 2306136; 785400, 2306325; 785976, 2306411; 786598, 2306408; 786651, 2306403; 786837, 2306385; 787682, 2306203; 788005, 2306134; 789162, 2305885; 789198, 2305890; 789297, 2305904; 789492, 2305870; 790364, 2305412; 791696, 2304712; 791696, 2304710; 791671, 2304359; 791781, 2304297; 791780, 2304294; 791653, 2304101; 791627, 2303742; 791158, 2303230; 791158, 2302616; 791149, 2302250; 791407, 2301760; 791550, 2301582; 790766, 2302188; 790511, 2302348; 790503, 2302354; 790502, 2302354; 790198, 2302345; 790198, 2302344; 789827, 2302625; 788750, 2303441; 788540, 2303493; 788181, 2303547; 787765, 2303538; 787076, 2303479; 786758, 2303386; 786339, 2303226; 786095, 2303051; 785740, 2302863; 785554, 2302748; 785510, 2302753; 785357, 2302772; 785246, 2302785; 785206, 2302791; 785067, 2302898; 784947, 2303017; 784875, 2303047; 784803, 2303101; 784660, 2303678; 784551, 2303694; 783794, 2305326; 784087, 2305516; 784183, 2305615; return to starting point.

(B) **Note:** Map 17 follows:

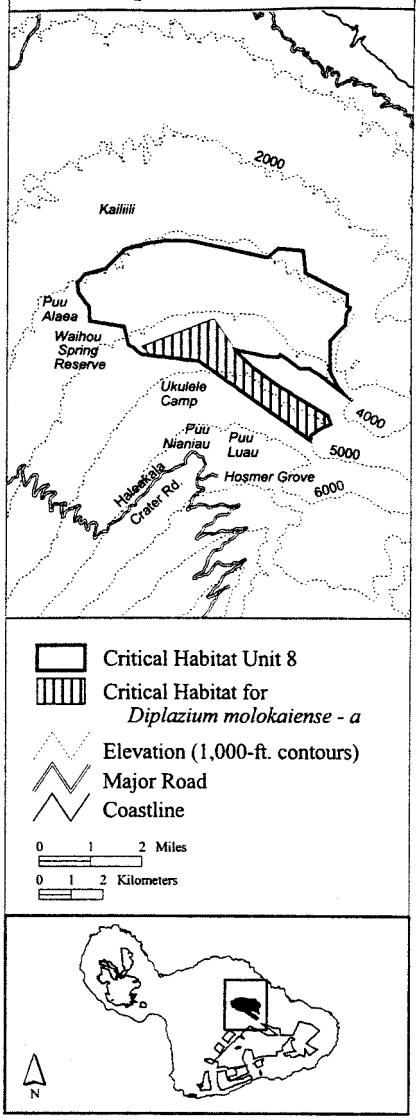


(xviii) Maui 8—*Diplazium molokaiense*—a (574 ha; 1,419 ac).

(A) Unit consists of the following 91 boundary points: Start at 788179, 2302942; 788284, 2302790; 788714, 2302383; 789527, 2301802; 789911, 2301569; 789906, 2301556; 791083, 2300859; 791083, 2300858; 791164, 2300577; 790858, 2300440; 790545, 2300227; 790534, 2300210; 790469, 2300111; 790425, 2300143; 790396, 2300164; 790270, 2300253; 790224, 2300285; 790198, 2300304; 790089, 2300382; 790055, 2300406; 790028, 2300425; 789912, 2300508; 789880, 2300531; 789749, 2300625; 789706, 2300655; 789647, 2300697; 789572, 2300752; 789531, 2300780; 789502, 2300802; 789471, 2300823; 789458, 2300832; 789393, 2300880; 789355, 2300906; 789339, 2300917; 789210, 2301009; 789182, 2301030; 789152, 2301051; 789038, 2301132; 789009, 2301153; 788981, 2301173; 788864, 2301257; 788834, 2301279; 788804, 2301301; 788692, 2301381; 788635, 2301422; 788527, 2301498; 788489, 2301526; 788434, 2301565; 788343, 2301629; 788313, 2301650; 788288, 2301668; 788190, 2301738; 788141, 2301774; 788117, 2301792; 787998, 2301875; 787965, 2301899; 787938, 2301919; 787838, 2301989; 787796, 2302020; 787771, 2302038; 787661, 2302116; 787622, 2302144; 787597, 2302162; 787492, 2302236; 787423, 2302286; 787307, 2302369; 787253, 2302408; 787141, 2302489; 787105, 2302512; 787079, 2302531; 787026, 2302568; 787026, 2302569; 786951, 2302579; 786738, 2302604; 786661, 2302613; 786491, 2302633; 786339, 2302653; 786280, 2302660; 786106, 2302680; 786032, 2302690; 785884, 2302707; 785796, 2302718; 785680, 2302732; 785510, 2302753; 785504, 2302754; 785239, 2303033; 785221, 2303039; 785230, 2303043; 785221, 2303052; 785248, 2303050; 787496, 2303927; return to starting point.

(B) **Note:** Map 18 follows:

Map 18
Unit 8 - *Diplazium molokaiense - a*

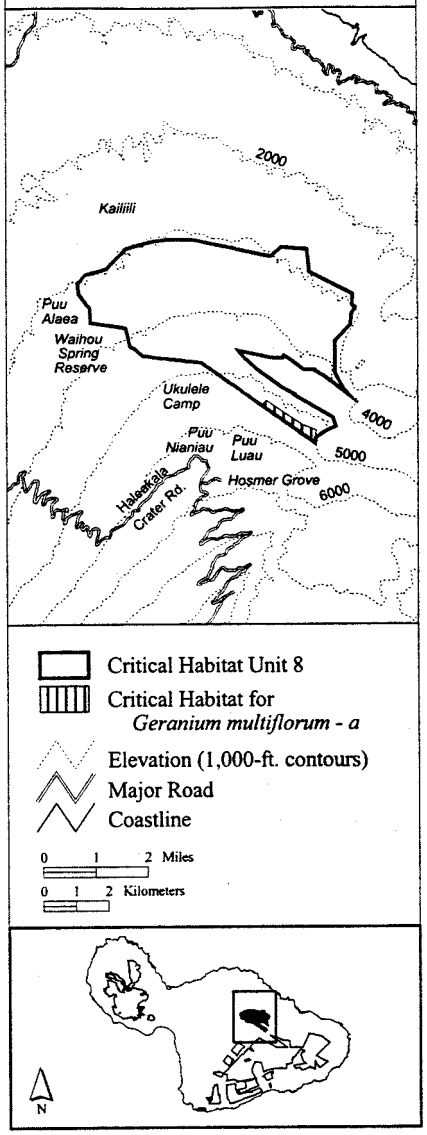


(xix) Maui 8—*Geranium multiflorum*—a (46 ha; 113 ac).

(A) Unit consists of the following 32 boundary points: Start at 790534, 2300210; 790525, 2300071; 790425, 2300143; 790396, 2300164; 790270, 2300253; 790224, 2300285; 790198, 2300304; 790089, 2300382; 790055, 2300406; 790028, 2300425; 789912, 2300508; 789880, 2300531; 789749, 2300625; 789706, 2300655; 789647, 2300697; 789572, 2300752; 789531, 2300780; 789502, 2300802; 789466, 2300826; 789393, 2300880; 789355, 2300906; 789339, 2300917; 789210, 2301009; 789182, 2301030; 789152, 2301051; 789038, 2301132; 789009, 2301153; 788981, 2301173; 788881, 2301245; 789034, 2301393; 790128, 2300638; 790551, 2300470; return to starting point.

(B) **Note:** Map 19 follows:

Map 19
Unit 8 - *Geranium multiflorum - a*

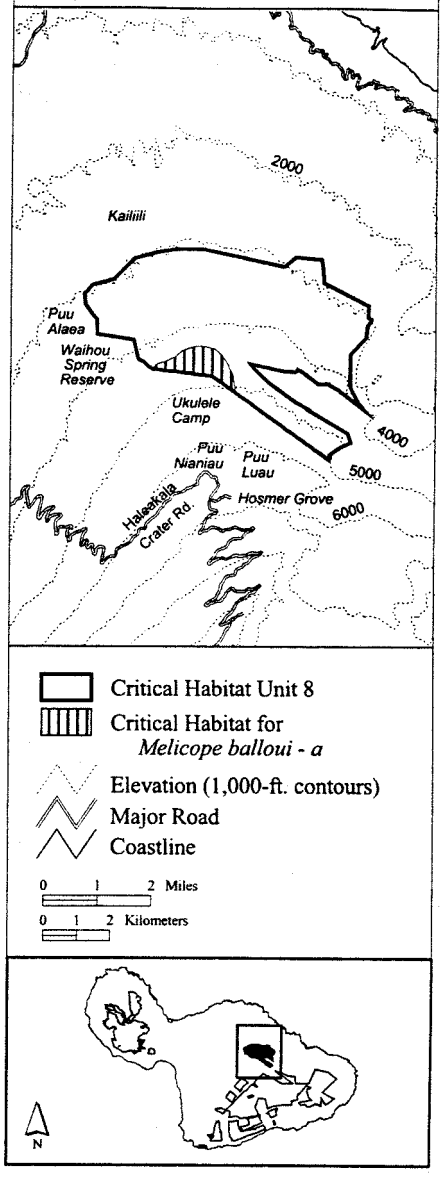


(xx) Maui 8—*Melicope balloui*—a (151 ha; 374 ac).

(A) Unit consists of the following 42 boundary points: Start at 787661, 2302116; 787622, 2302144; 787597, 2302162; 787492, 2302236; 787423, 2302286; 787307, 2302369; 787253, 2302408; 787141, 2302489; 787105, 2302512; 787079, 2302531; 787026, 2302568; 787026, 2302569; 786951, 2302579; 786738, 2302604; 786661, 2302613; 786491, 2302633; 786339, 2302653; 786280, 2302660; 786106, 2302680; 786032, 2302690; 785884, 2302707; 785796, 2302718; 785680, 2302732; 785510, 2302753; 785357, 2302772; 785248, 2302785; 785306, 2302888; 785406, 2302943; 785630, 2303011; 785923, 2303157; 786143, 2303330; 786357, 2303424; 786541, 2303481; 786781, 2303481; 787100, 2303408; 787288, 2303230; 787513, 2302911; 787513, 2302859; 787634, 2302639; 787702, 2302252; 787717, 2302148; 787677, 2302105; return to starting point.

(B) **Note:** Map 20 follows:

Map 20
Unit 8 - *Melicope balloui - a*

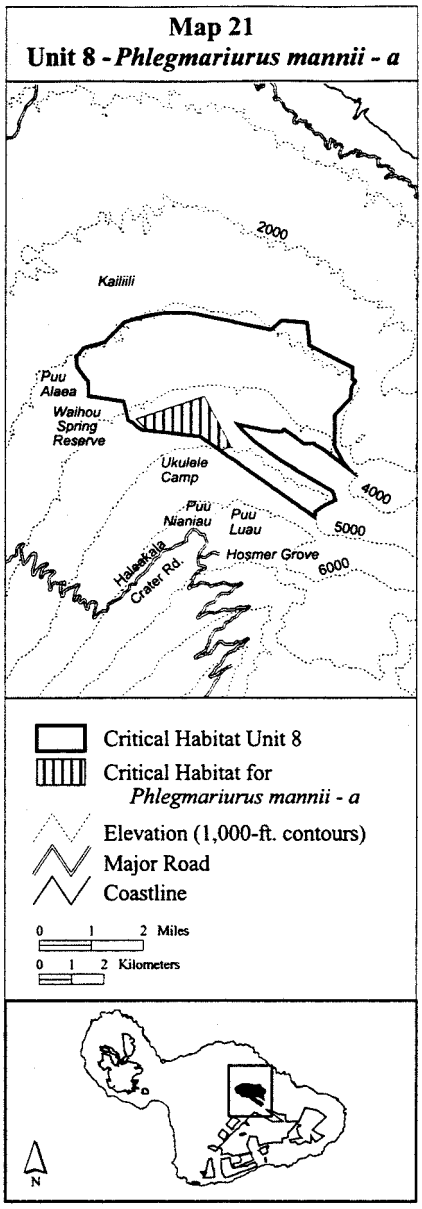


(xxi) Maui 8—*Phlegmariurus mannii*—a (221 ha; 547 ac).

(A) Unit consists of the following 28 boundary points: Start at 787622, 2302144; 787597, 2302162; 787492, 2302236; 787423, 2302286; 787307, 2302369; 787253, 2302408; 787141, 2302489; 787105, 2302512; 787079, 2302531; 787026, 2302568; 787026, 2302569; 786951, 2302579; 786738, 2302604; 786661, 2302613; 786491, 2302633; 786339, 2302653; 786280, 2302660; 786106, 2302680; 786032, 2302690; 785884, 2302707; 785796,

2302718; 785680, 2302732; 785510, 2302753; 785414, 2302765; 785047, 2303112; 787157, 2303805; 787966, 2302253; 787643, 2302129; return to starting point.

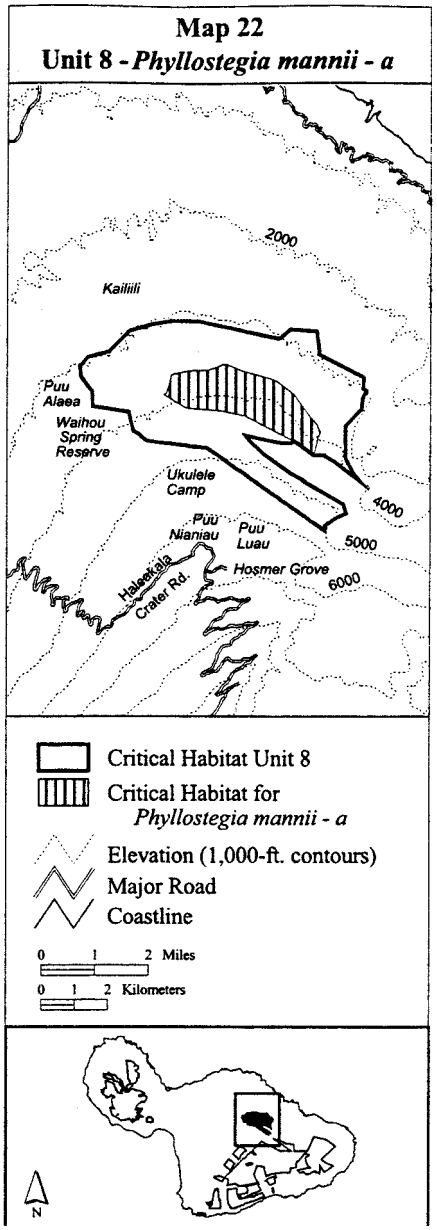
(B) **Note:** Map 21 follows:



(xxii) Maui 8—*Phyllostegia mannii*—a (570 ha; 1,407 ac).

(A) Unit consists of the following 26 boundary points: Start at 789827, 2302625; 789610, 2302774; 789577, 2302791; 788148, 2303539; 787484, 2303692; 786396, 2303777; 785739, 2304188; 785794, 2304239; 785860, 2304480; 785944, 2304792; 786485, 2304912; 787026, 2304936; 787302, 2305014; 787488, 2305093; 787615, 2305093; 788065, 2304906; 788906, 2304672; 789100, 2304588; 789615, 2304203; 789825, 2303873; 790084, 2303525; 790288, 2303290; 790396, 2303032; 790324, 2302870; 790294, 2302671; 790206, 2302365; return to starting point.

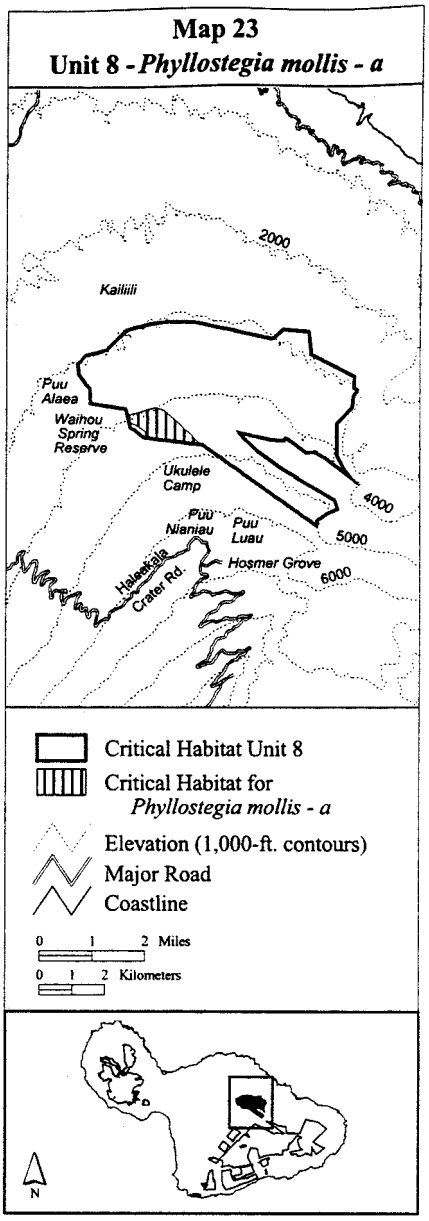
(B) **Note:** Map 22 follows:



(xxiii) Maui 8—*Phyllostegia mollis*—a (128 ha; 316 ac).

(A) Unit consists of the following 20 boundary points: Start at 785938, 2302701; 785884, 2302707; 785796, 2302718; 785680, 2302732; 785510, 2302753; 785357, 2302772; 785247, 2302785; 785274, 2302870; 785281, 2302986; 784974, 2303191; 784840, 2303242; 784725, 2303477; 785401, 2303682; 785589, 2303726; 785845, 2303639; 786322, 2303224; 786467, 2303065; 786660, 2302911; 786775, 2302757; 786962, 2302596; return to starting point.

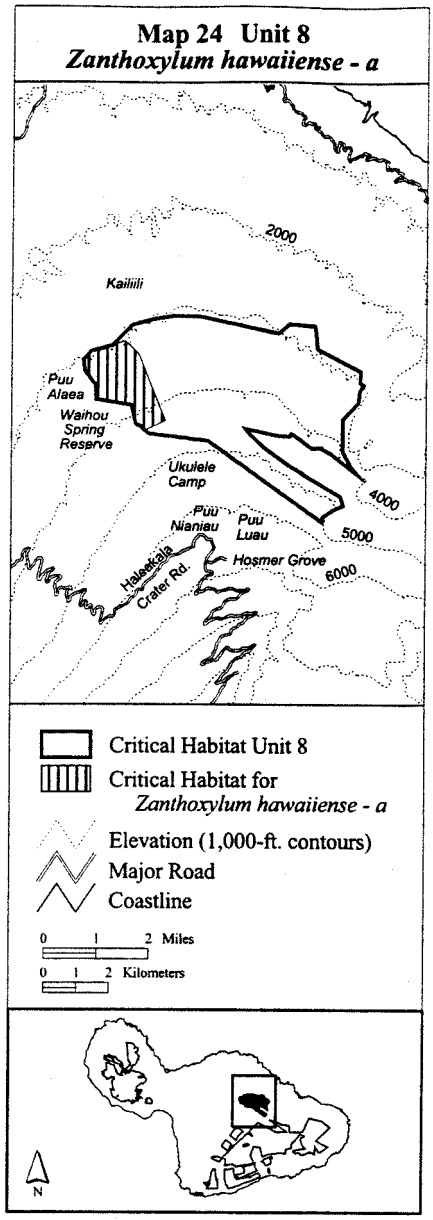
(B) **Note:** Map 23 follows:



(xxiv) Maui 8—*Zanthoxylum hawaiiense*—a (362 ha; 895 ac)

(A) Unit consists of the following 24 boundary points: Start at 783221, 2305104; 783425, 2305329; 783765, 2305418; 783933, 2305472; 783961, 2305480; 783967, 2305482; 784075, 2305511; 784083, 2305519; 784480, 2305646; 784882, 2305244; 785713, 2303193; 785079, 2302889; 785056, 2302911; 784947, 2303017; 784803, 2303101; 784660, 2303678; 783584, 2303838; 783583, 2303838; 783559, 2304310; 783487, 2304405; 783488, 2304406; 783486, 2304406; 783228, 2304747; 783196, 2305076; return to starting point.

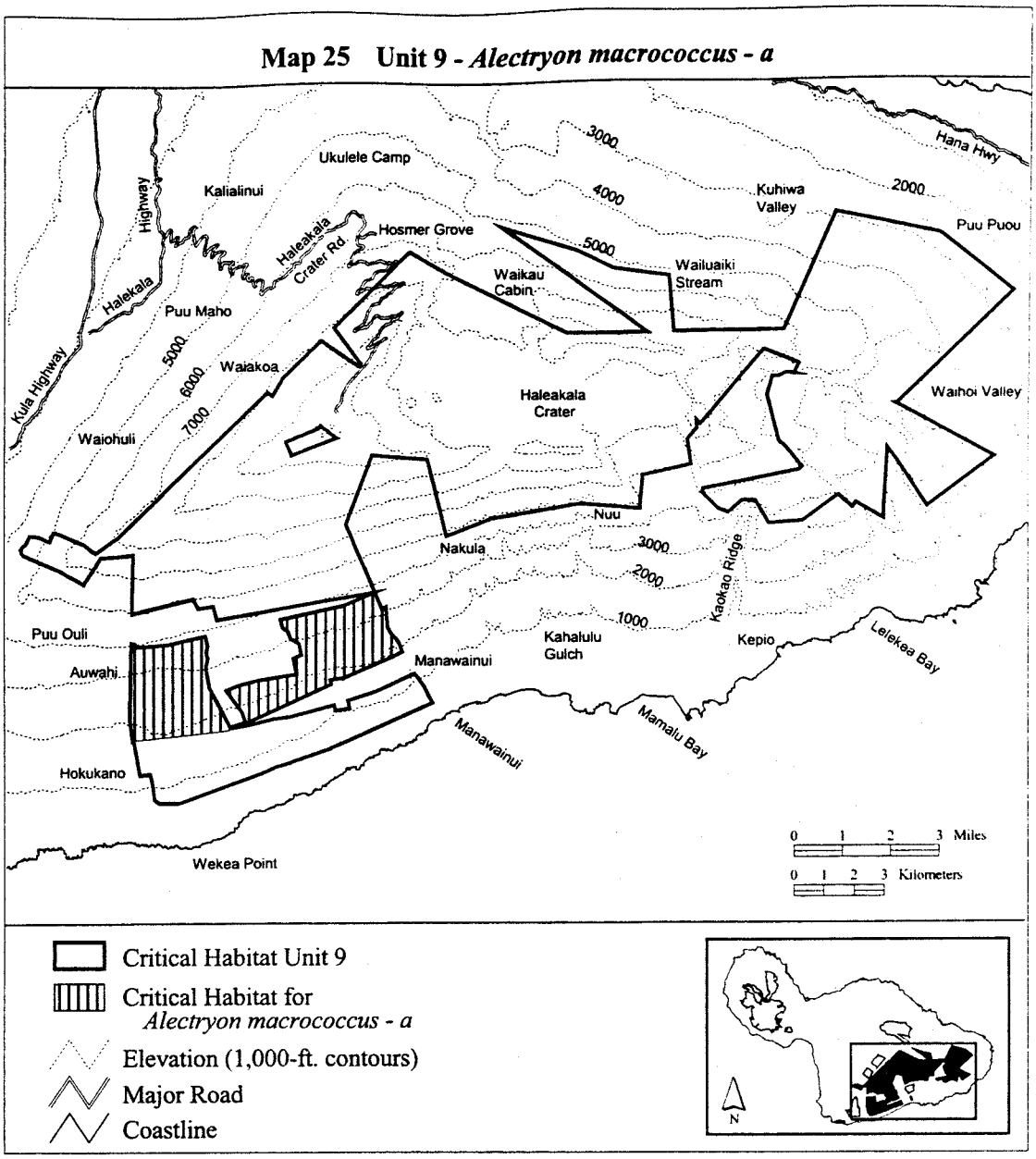
(B) **Note:** Map 24 follows:



(xxv) Maui 9—*Alectryon macrococcus*—a (1,893 ha; 4,678 ac).

(A) Unit consists of the following 87 boundary points: Start at 787503, 2286804; 787552, 2286825; 787793, 2286254; 787882, 2286300; 787924, 2286322; 787969, 2285836; 787982, 2285645; 788112, 2285409; 788112, 2285408; 788269, 2285261; 788387, 2285086; 788485, 2284821; 788486, 2284815; 788116, 2284626; 788115, 2284625; 786708, 2284032; 786514, 2283946; 786511, 2283963; 786509, 2283964; 786072, 2283891; 786071, 2283889; 786091, 2283757; 785721, 2283591; 782955, 2282353; 782675, 2282228; 779507, 2281898; 779470, 2281894; 779468, 2281911; 779453, 2282018; 779433, 2282157; 779422, 2282233; 779414, 2282298; 779404, 2282370; 779384, 2282500; 779372, 2282586; 779369, 2282603; 779370, 2282710; 779372, 2282813; 779377, 2282926; 779379, 2283091; 779379, 2283156; 779384, 2283260; 779385, 2283362; 779386, 2283461; 779389, 2283570; 779391, 2283672; 779394, 2283769; 779397, 2283875; 779398, 2283992; 779401, 2284094; 779401, 2284203; 779403, 2284241; 779406, 2284322; 779413, 2284560; 779419, 2284768; 779424, 2284997; 779552, 2285008; 780605, 2285094; 781897, 2285373; 781955, 2285060; 781922, 2284849; 781966, 2284605; 781901, 2284319; 782031, 2283673; 782383, 2282985; 782730, 2282341; 782731, 2282340; 783230, 2282513; 783231, 2282514; 783231, 2282515; 783112, 2282851; 782588, 2283565; 782997, 2283742; 783717, 2283910; 784941, 2284105; 784942, 2284105; 784943, 2284107; 784824, 2284610; 785088, 2284723; 785089, 2284725; 785013, 2285109; 785013, 2285110; 784720, 2285273; 784639, 2285527; 784482, 2285614; 784385, 2285911; 786496, 2286367; return to starting point.

(B) **Note:** Map 25 follows:



(xxvi) Maui 9—*Argyroxiphium sandwicense* ssp. *macrocephalum*—a (9,041 ha; 22,340 ac).

(A) Unit consists of the following 159 boundary points: Start at 778986, 2288684; 778989, 2288687; 779048, 2288746; 779070, 2288768; 780400, 2290082; 780392, 2290088; 780380, 2290097; 781358, 2291060; 781772, 2291467; 783957, 2293620; 784132, 2293514; 784471, 2294125; 785753, 2295387; 785766, 2295377; 785773, 2295373; 785784, 2295366; 785798, 2295356; 785812, 2295346; 785831, 2295333; 785843, 2295325; 785871, 2295305; 785887, 2295294; 785904, 2295283; 785906, 2295281; 785922, 2295270; 785931, 2295264; 785949, 2295252; 785962, 2295242; 785975, 2295233; 785995, 2295220; 786007, 2295211; 786012, 2295208; 786032, 2295194; 786034, 2295193; 786047, 2295183; 786054, 2295179; 786071, 2295167; 786099, 2295147; 786102, 2295145; 786104, 2295144; 786108, 2295141; 786113, 2295137; 786127, 2295127; 786136, 2295121; 786146, 2295115; 786153, 2295110; 786155, 2295108; 786173, 2295096; 786193, 2295082; 786225, 2295060; 786238, 2295051; 786290, 2295015; 786293, 2295013; 786317, 2294997; 786332, 2294986; 786344, 2294978; 786351, 2294973; 786354, 2294971; 786363, 2294965; 786368, 2294961; 786378, 2294954; 786390, 2294945; 786395, 2294943; 786413, 2294930; 786415, 2294929; 786420, 2294926; 786424, 2294923; 786464, 2294895; 786474, 2294887; 786483, 2294882; 786493, 2294875; 786507, 2294865; 786518, 2294857; 786525, 2294853; 786537, 2294844; 786558, 2294830; 786582, 2294813; 786597, 2294803; 786600, 2294801; 786616, 2294789; 786634, 2294777; 786668, 2294753; 786701, 2294730; 786716, 2294721; 786759, 2294691; 786775, 2294680; 786777, 2294679; 786791, 2294668; 786810, 2294655; 786824, 2294646; 786843, 2294633; 786895, 2294597; 786905, 2294591; 786915, 2294583; 786917, 2294582; 786938, 2294566; 786957, 2294554; 786990, 2294532; 787001, 2294523; 787015, 2294513; 787022, 2294508; 787024, 2294508; 787025, 2294508; 787038, 2294530; 787082,

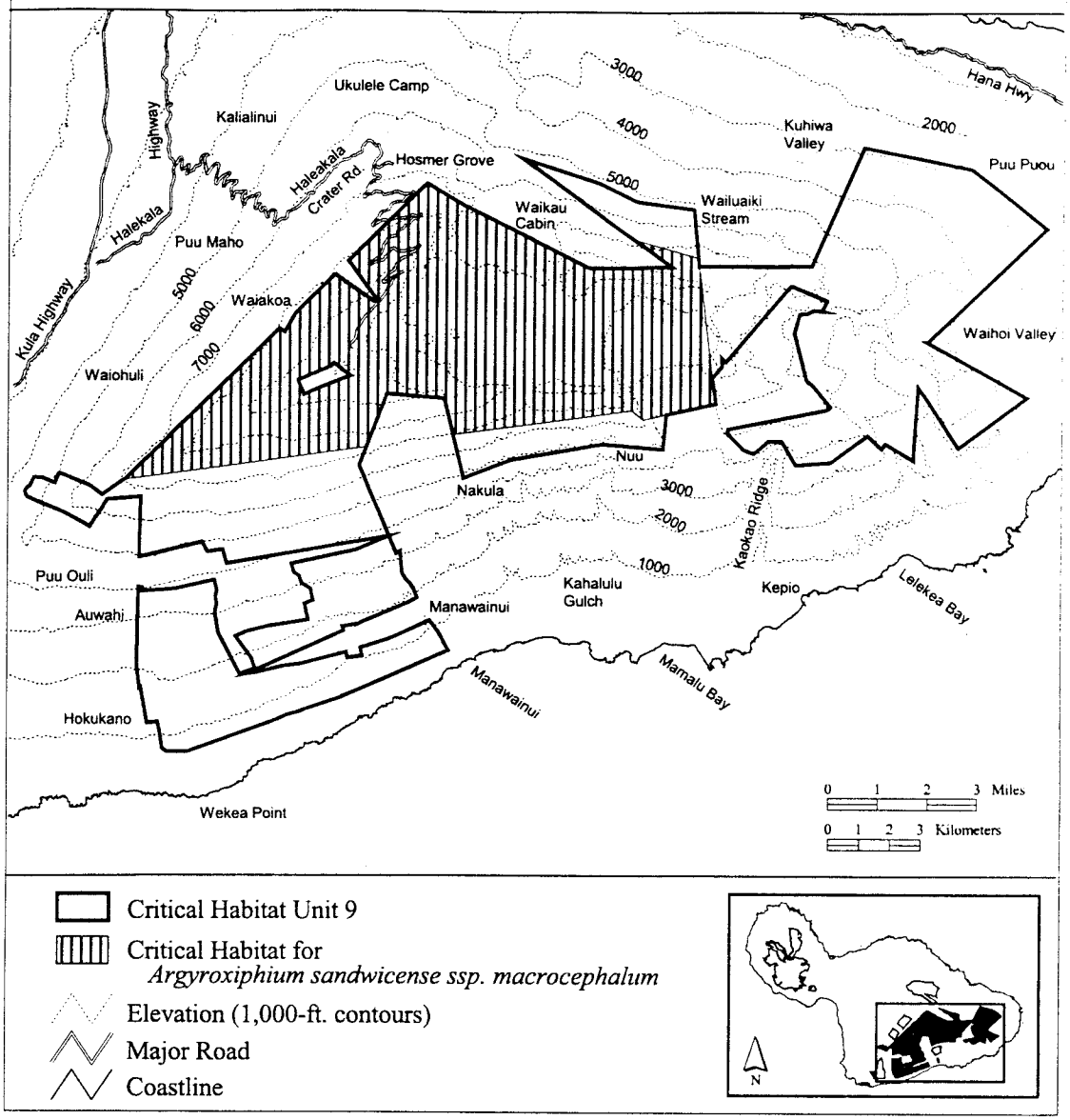
2294593; 786188, 2295812; 788190, 2297786; 788404, 2297994; 788742, 2298301; 788752, 2298310; 788754, 2298309; 788785, 2298291; 788906, 2298219; 788934, 2298204; 788940, 2298201; 788942, 2298200; 788965, 2298185; 789012, 2298158; 789034, 2298146; 789372, 2297947; 789683, 2297771; 789712, 2297753; 789756, 2297728; 789999, 2297585; 790577, 2297304; 790826, 2297180; 791591, 2296795; 794000, 2295593; 795810, 2295621; 795945, 2295623; 796322, 2295627; 796366, 2295628; 796367, 2295628; 796710, 2295632; 796712, 2295633; 796712, 2295635; 796322, 2295917; 796064, 2296102; 795805, 2296286; 795433, 2296550; 797565, 2295906; 797569, 2295864; 797581, 2295638; 797634, 2295413; 798056, 2292032; 798056, 2292031; 798107, 2291624; 798165, 2291162; 796929, 2290891; 796545, 2290807; 795794, 2290643; 795424, 2290939; 795382, 2290933; 789630, 2290134; 789516, 2290615; 789343, 2291348; 787469, 2291492; 786812, 2289742; 778932, 2288646; return to starting point.

(B) Excluding the area bounded by the following 42 boundary points (76ha; 189ac):

Start at 784680, 2291987; 784747, 2292015; 784786, 2292031; 784910, 2292083; 784946, 2292099; 784984, 2292116; 785051, 2292143; 785110, 2292167; 785146, 2292182; 785204, 2292207; 785308, 2292250; 785341, 2292265; 785383, 2292282; 785501, 2292330; 785537, 2292346; 785576, 2292362; 785614, 2292410; 785643, 2292390; 785674, 2292428; 785689, 2292448; 785732, 2292503; 785780, 2292466; 785847, 2292414; 785871, 2292394; 785930, 2292350; 785942, 2292341; 785983, 2292310; 785993, 2292302; 786016, 2292284; 786041, 2292263; 786107, 2292213; 786138, 2292189; 786181, 2292155; 786209, 2292133; 786238, 2292111; 786263, 2292091; 785264, 2291677; 784769, 2291468; 784742, 2291524; 784703, 2291618; 784568, 2291939; 784568, 2291941; return to starting point.

(C) **Note:** Map 26 follows:

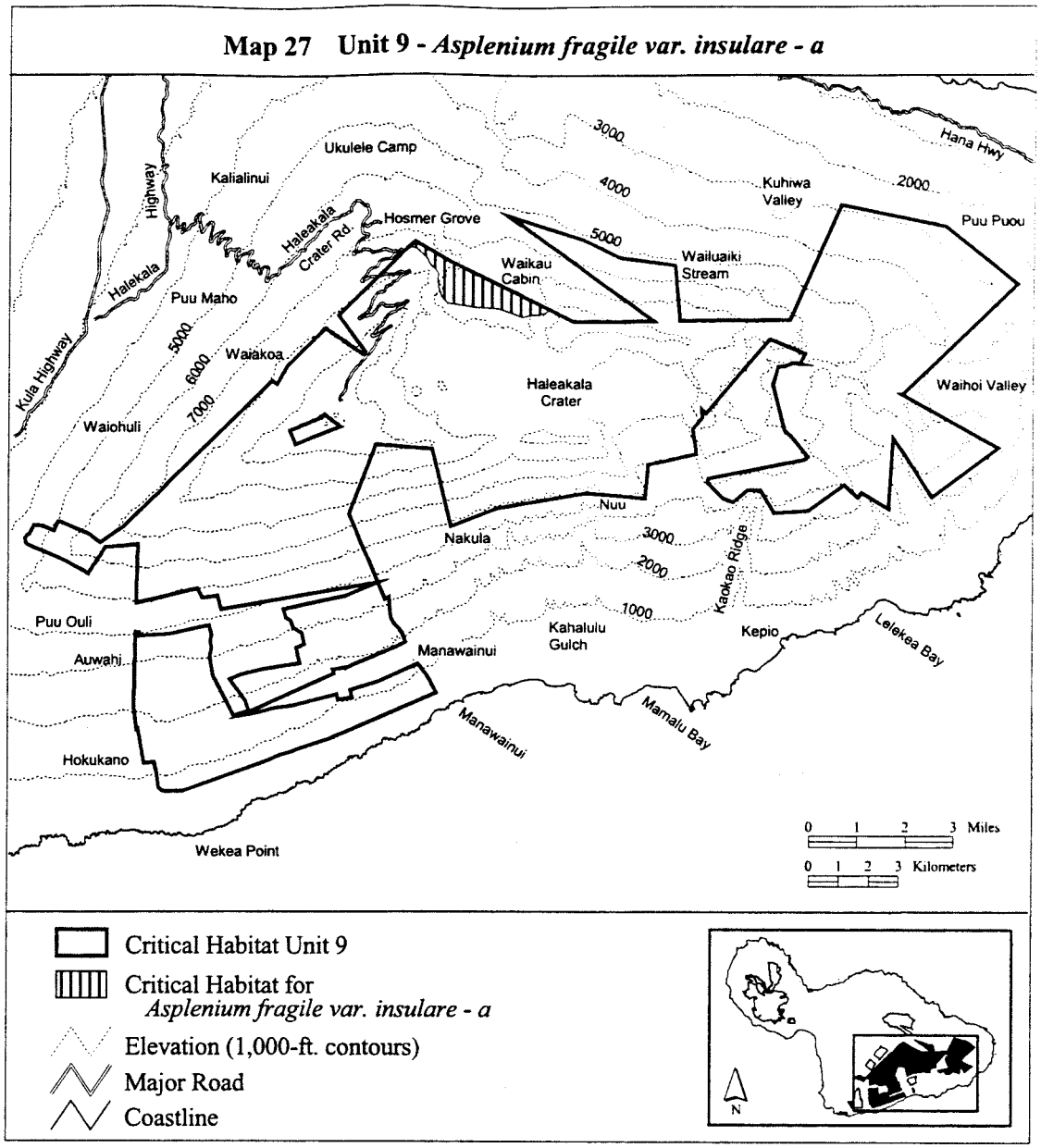
Map 26 Unit 9 - *Argyroxiphium sandwicense ssp. macrocephalum*



(xxvii) Maui 9—*Asplenium fragile* var. *insulare*—a (362 ha; 894 ac).

(A) Unit consists of the following 74 boundary points: Start at 788543, 2298123; 788563, 2298140; 788600, 2298173; 788754, 2298309; 788785, 2298291; 788906, 2298219; 788934, 2298204; 788942, 2298200; 788965, 2298185; 789012, 2298158; 789097, 2298111; 789125, 2298094; 789154, 2298077; 789279, 2298004; 789310, 2297986; 789342, 2297969; 789450, 2297905; 789495, 2297879; 789521, 2297863; 789656, 2297787; 789683, 2297771; 789712, 2297753; 789841, 2297681; 789867, 2297664; 789901, 2297645; 789955, 2297614; 790033, 2297574; 790061, 2297560; 790093, 2297545; 790216, 2297485; 790249, 2297467; 790279, 2297452; 790304, 2297441; 790412, 2297387; 790443, 2297372; 790472, 2297357; 790581, 2297304; 790638, 2297276; 790666, 2297261; 790719, 2297235; 790800, 2297196; 790831, 2297181; 790865, 2297163; 790992, 2297102; 791409, 2296895; 791824, 2296689; 792240, 2296482; 792444, 2296380; 792449, 2296378; 792655, 2296275; 793070, 2296068; 793155, 2296026; 793157, 2295951; 793118, 2295890; 792901, 2295834; 792611, 2295823; 792304, 2295750; 791909, 2295901; 791480, 2296046; 791067, 2296068; 790755, 2296079; 790543, 2296118; 789819, 2296246; 789629, 2296452; 789535, 2296731; 789485, 2296976; 789512, 2297221; 789514, 2297223; 789451, 2297316; 789306, 2297478; 789212, 2297600; 789145, 2297717; 788799, 2298069; 788554, 2298124; return to starting point.

(B) **Note:** Map 27 follows:

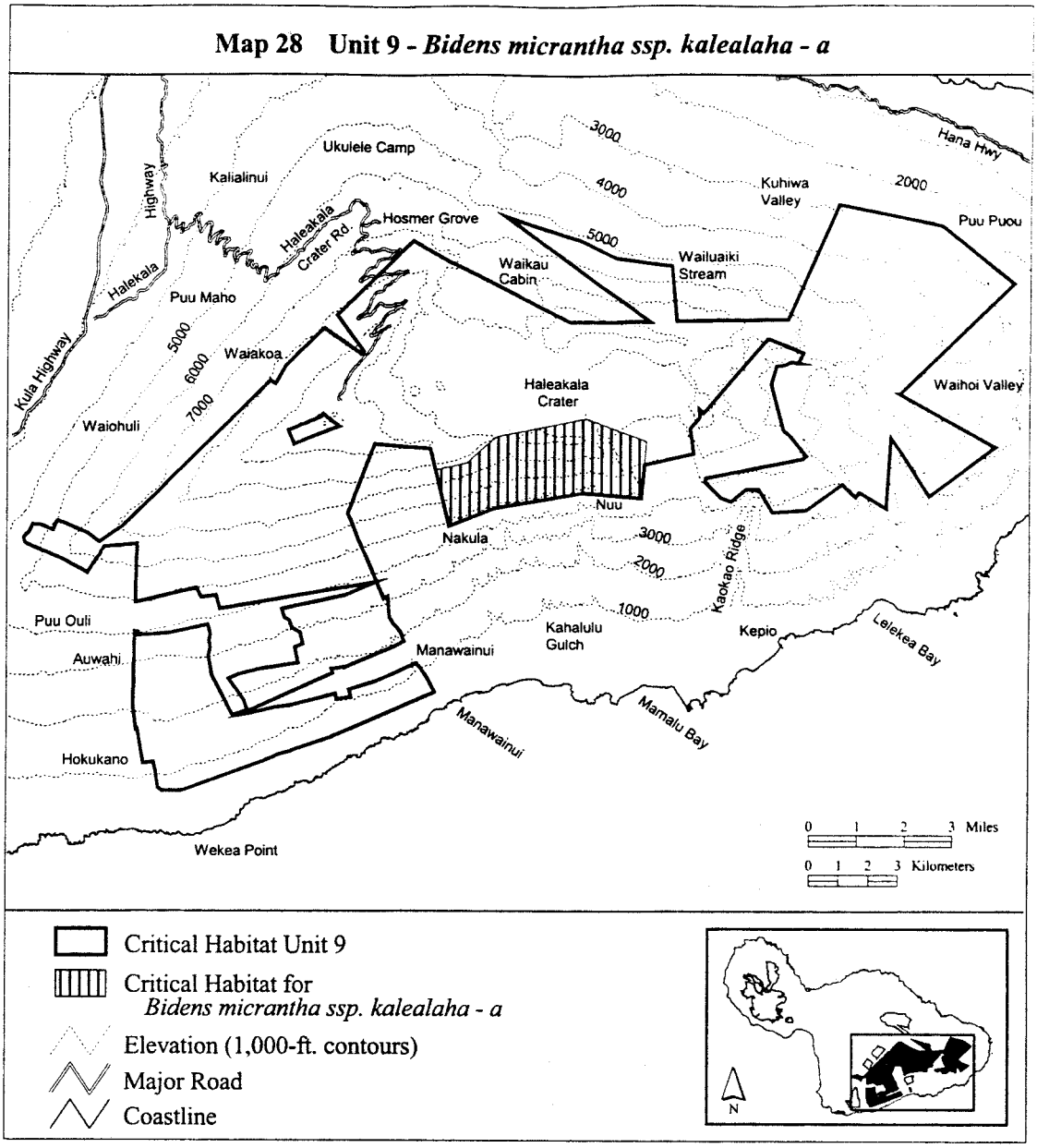


(xxviii) Maui 9—*Bidens micrantha* ssp. *kalealaha*—a (1,563 ha; 3,861 ac).

(A) Unit consists of the following 16 boundary points: Start at 796545, 2290807; 796545, 2290801; 796458, 2289725; 796454, 2289679; 796453,

2289665; 794502, 2289839; 794488, 2289840; 794474, 2289837; 791519, 2289316; 789966, 2288718; 789516, 2290615; 790559, 2290844; 791422, 2291618; 791566, 2291747; 794576, 2292372; 796609, 2291606; return to starting point.

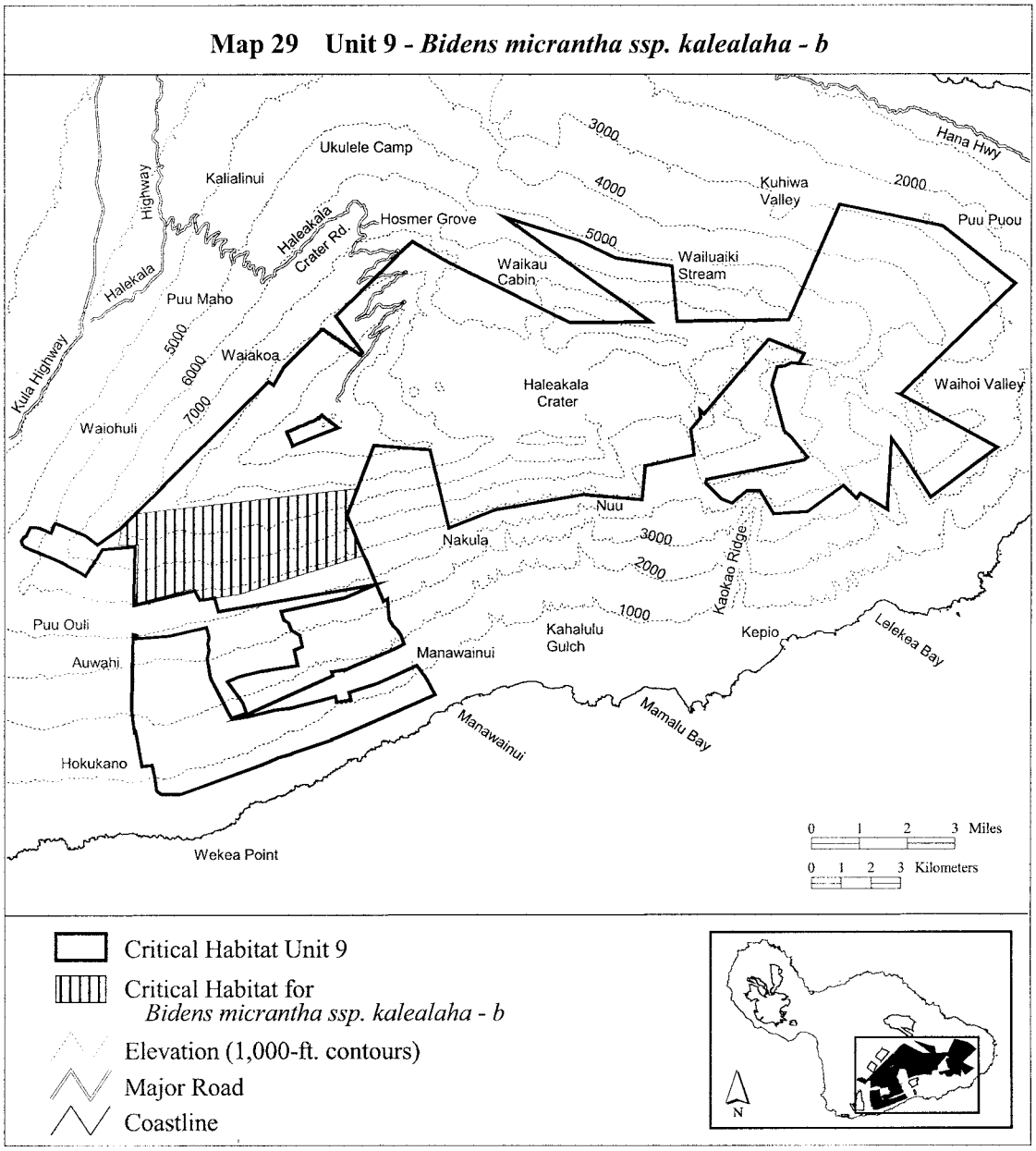
(B) **Note:** Map 28 follows:



(xxix) Maui 9—*Bidens micrantha* ssp. *kalealaha*—b (2,116 ha; 5,229 ac).

(A) Unit consists of the following 18 boundary points: Start at 779048, 2288746; 779070, 2288768; 779512, 2289205; 780627, 2289332; 782572, 2289555; 786928, 2290052; 786812, 2289742; 786580, 2289125; 786747, 2288730; 787145, 2287787; 782967, 2286486; 782162, 2286366; 781652, 2286290; 781485, 2286623; 781454, 2286686; 779524, 2286194; 779600, 2288162; 778935, 2288132; return to starting point.

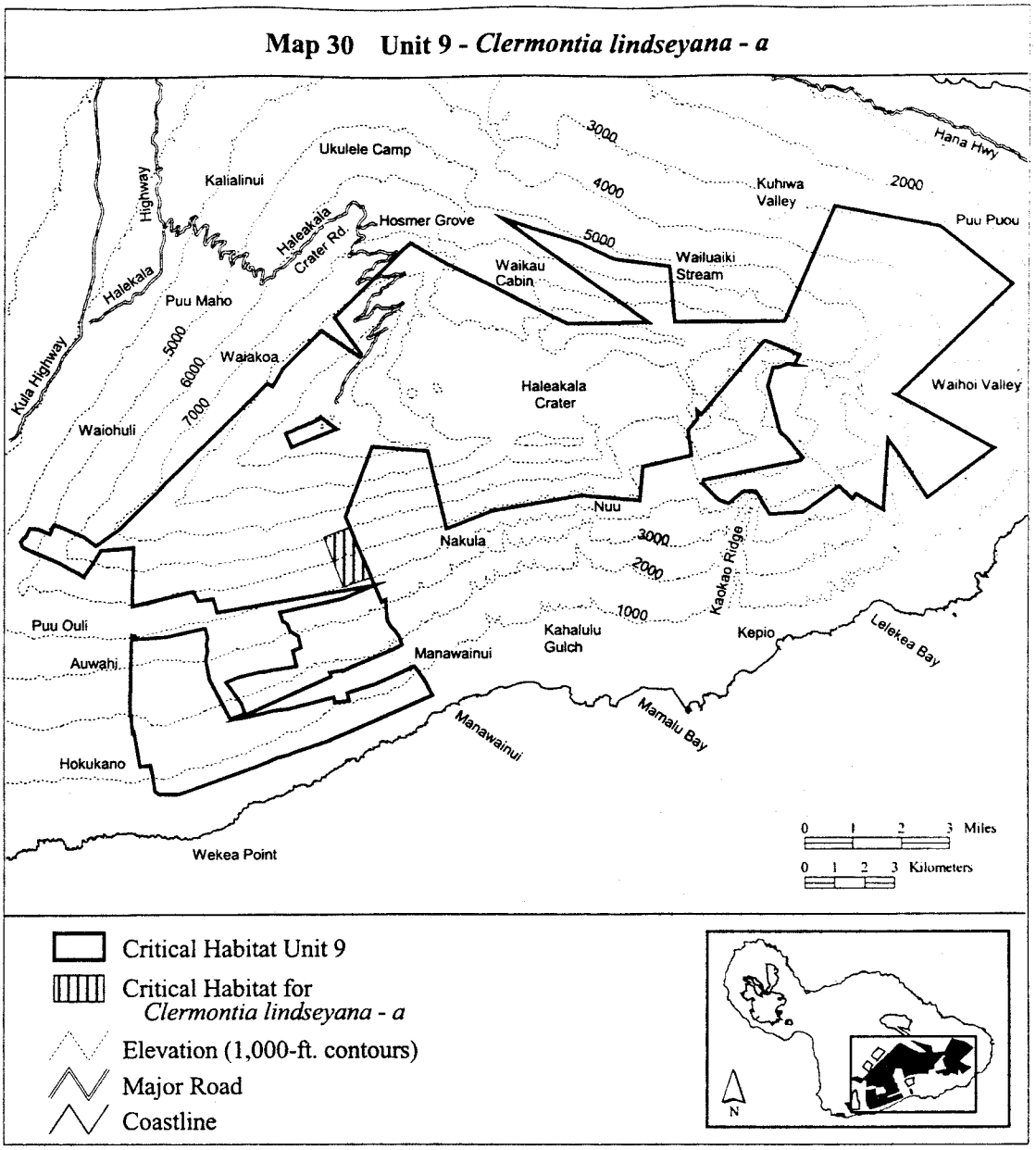
(B) **Note:** Map 29 follows:



(xxx) Maui 9—*Clermontia lindseyana*—a (177 ha; 438 ac).

(A) Unit consists of the following 5 boundary points: Start at 787444, 2287080; 787071, 2286938; 786501, 2286762; 785851, 2288424; 786721, 2288791; return to starting point.

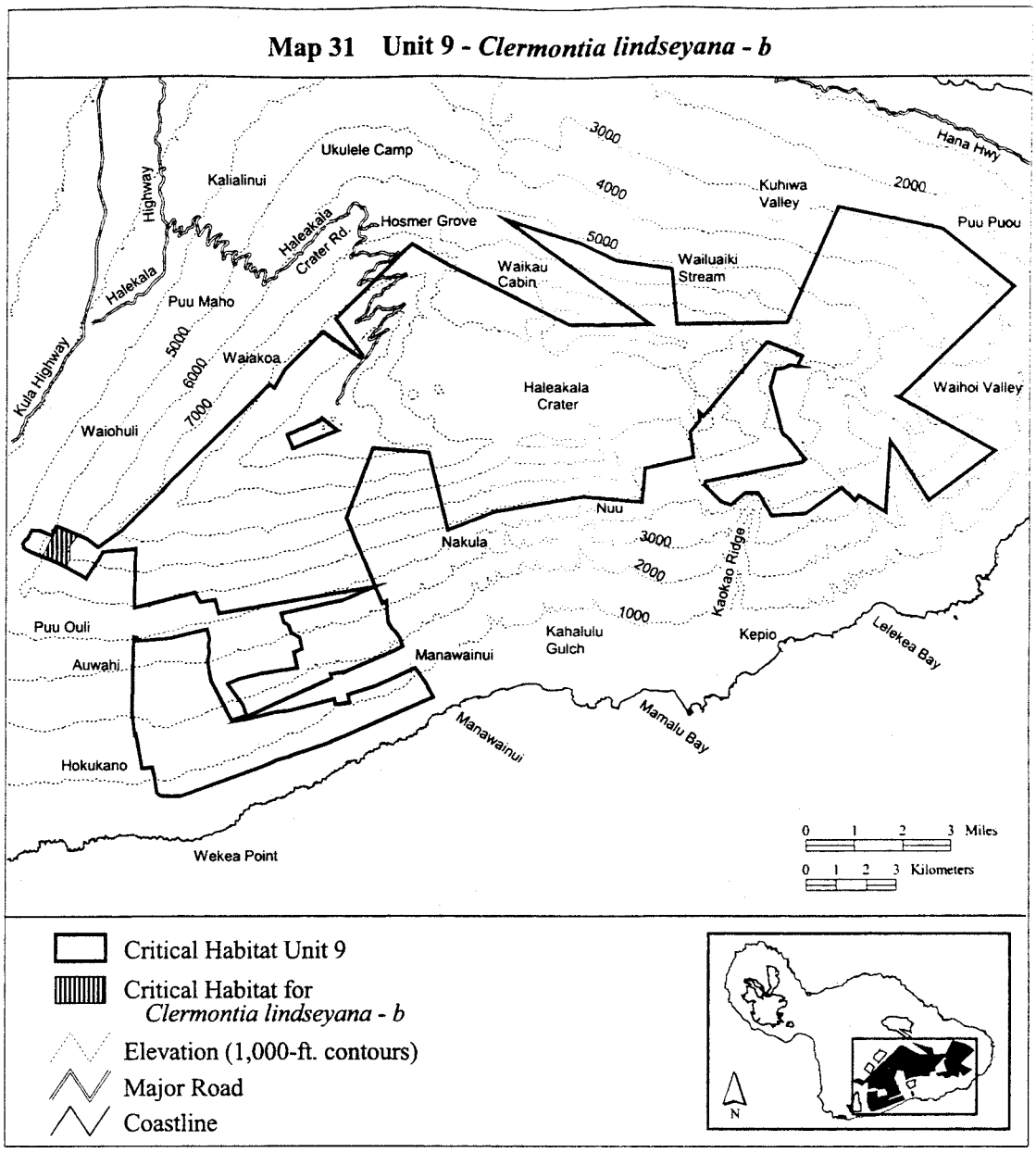
(B) **Note:** Map 30 follows:



(xxxi) Maui 9—*Clermontia lindseyana*—b (60 ha; 148 ac).

(A) Unit consists of the following 25 boundary points: Start at 776854, 2288875; 776854, 2288876; 776882, 2288864; 776920, 2288848; 776994, 2288817; 777561, 2288580; 777275, 2288186; 777275, 2287757; 777159, 2287487; 776983, 2287585; 776726, 2287694; 776756, 2287770; 776817, 2287928; 776860, 2288037; 776871, 2288068; 776895, 2288122; 776938, 2288237; 776979, 2288341; 777002, 2288401; 777006, 2288411; 777006, 2288412; 777006, 2288413; 777005, 2288413; 777005, 2288414; 776698, 2288553; return to starting point.

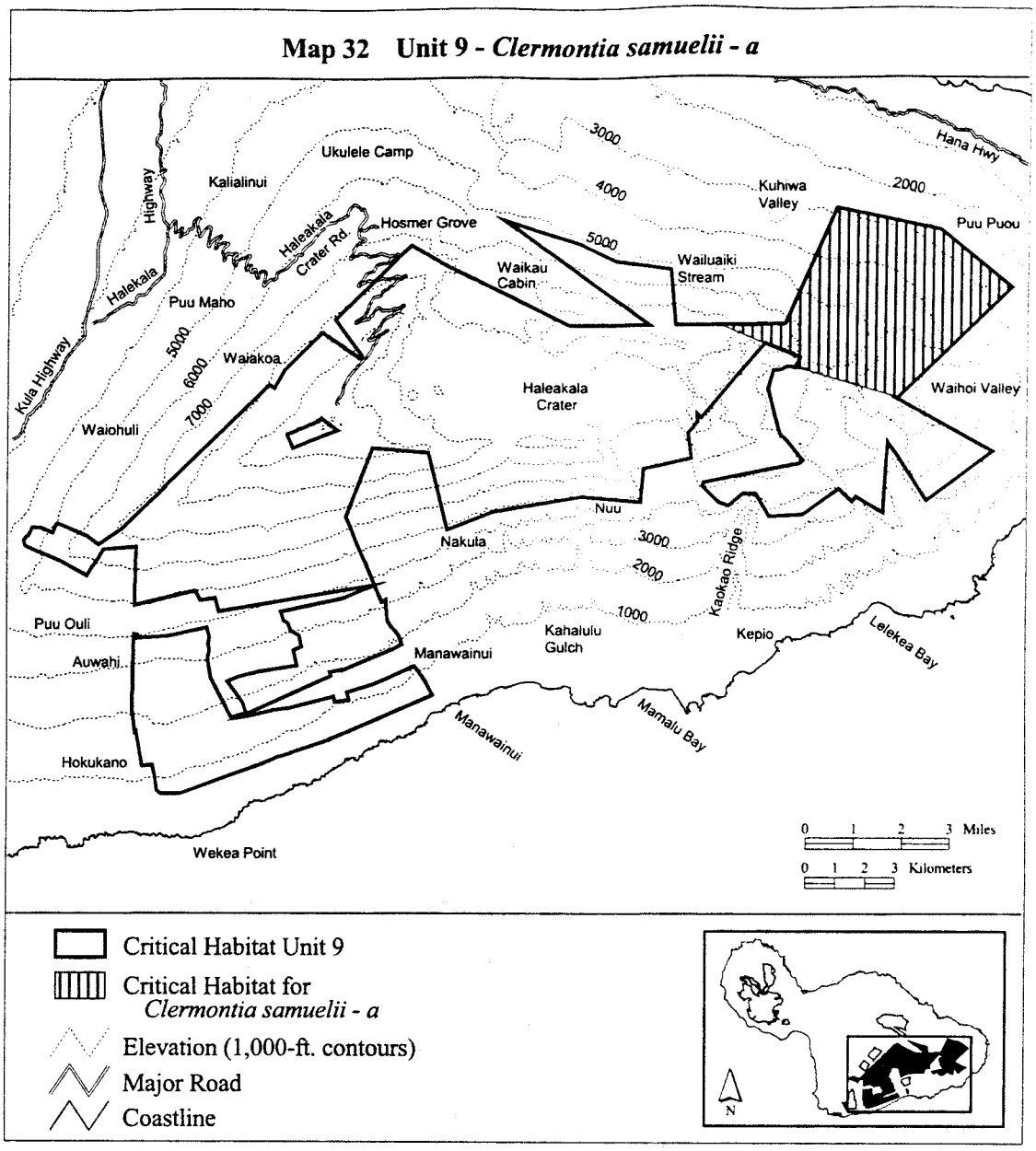
(B) **Note:** Map 31 follows:



(xxxii) Maui 9—*Clermontia samuelii*—a (3,130 ha; 7,734 ac).

(A) Unit consists of the following 27 boundary points: Start at 799099, 2295658; 799092, 2295661; 799244, 2295662; 799663, 2295668; 800082, 2295673; 800414, 2295677; 800379, 2295672; 800982, 2295684; 801296, 2295688; 801297, 2295688; 801369, 2295851; 802993, 2299556; 806459, 2298838; 807604, 2297939; 808913, 2296912; 805091, 2293218; 805090, 2293218; 801679, 2294214; 801640, 2294225; 801796, 2294569; 801346, 2294743; 801340, 2294745; 800636, 2295040; 800633, 2295036; 800632, 2295034; 800624, 2295037; 800620, 2295038; return to starting point.

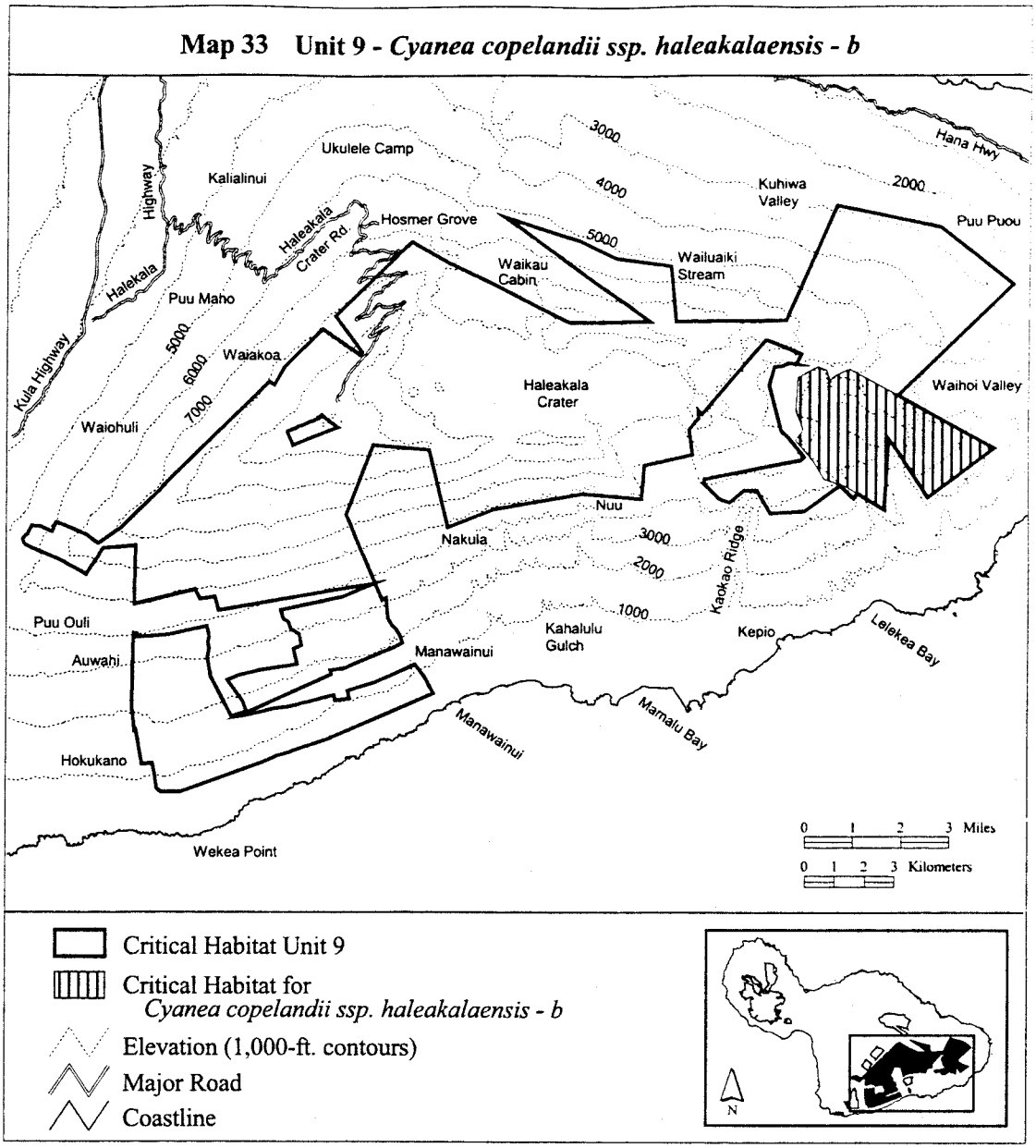
(B) **Note:** Map 32 follows:



(xiii) Maui 9—*Cyanea copelandii* ssp. *haleakalaensis*—b (1,709 ha; 4,224 ac).

(A) Unit consists of the following 21 boundary points: Start at 805053, 2293180; 806644, 2292314; 808301, 2291412; 806062, 2289747; 805115, 2291183; 804741, 2291728; 804610, 2289526; 804598, 2289317; 803684, 2289877; 803296, 2290115; 802589, 2290350; 802215, 2290953; 801641, 2291671; 801871, 2292015; 801641, 2292647; 801699, 2293766; 802359, 2294139; 802646, 2294024; 802761, 2293680; 802962, 2293852; 803432, 2294063; return to starting point.

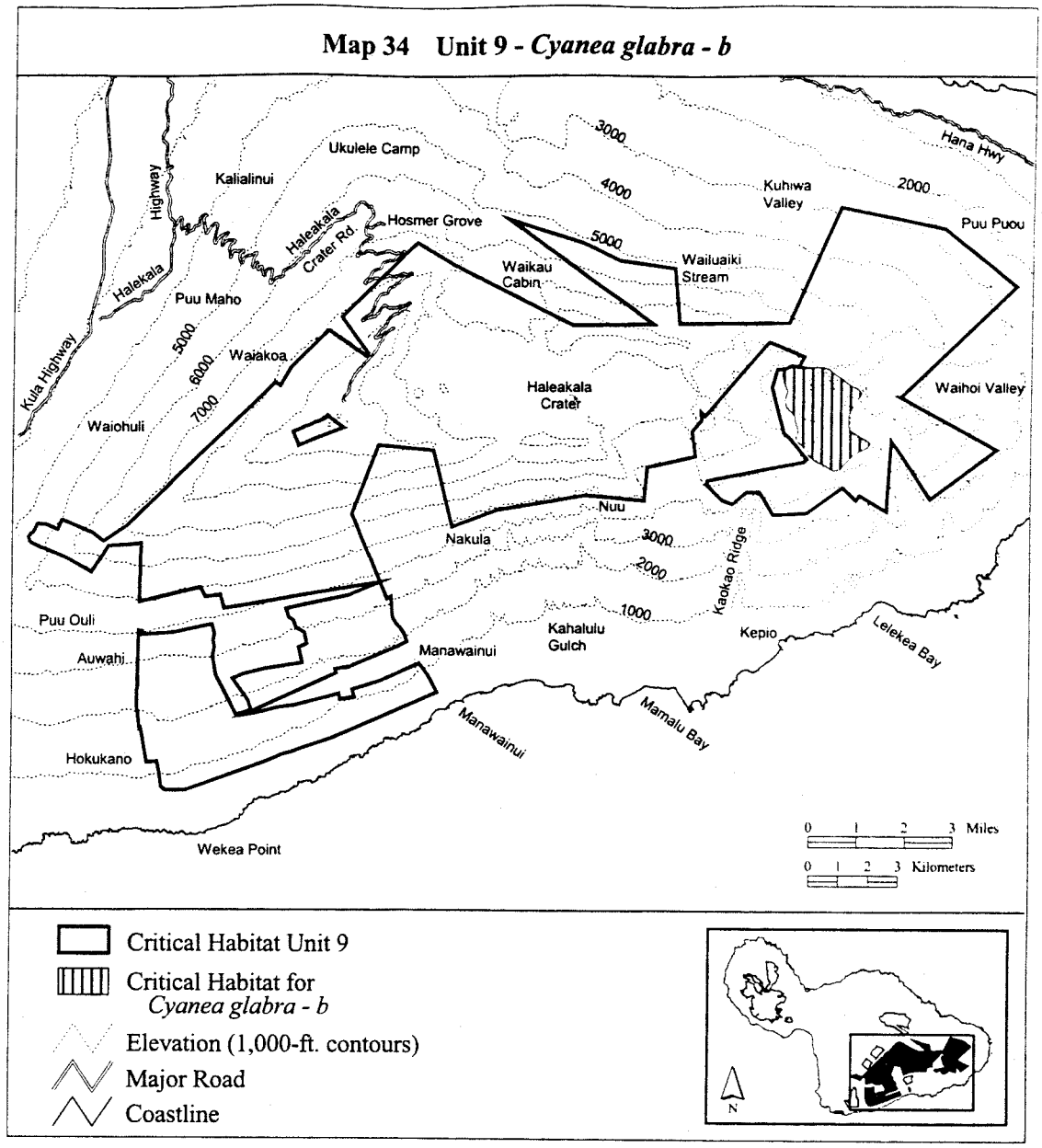
(B) **Note:** Map 33 follows:



(xxxiv) Maui 9—*Cyanea glabra*—b (650 ha; 1,605 ac).

(A) Unit consists of the following 50 boundary points: Start at 801146, 2294134; 801147, 2294134; 801185, 2294156; 801306, 2294225; 801376, 2294265; 801594, 2294228; 801679, 2294214; 801771, 2294198; 802073, 2294198; 802434, 2294198; 802655, 2294131; 802883, 2293924; 803365, 2293596; 803600, 2293468; 803707, 2293361; 803713, 2293247; 803425, 2292852; 803318, 2292564; 803312, 2292196; 803372, 2292055; 803713, 2291855; 803988, 2291687; 804008, 2291560; 803894, 2291480; 803680, 2291366; 803486, 2291265; 803305, 2291078; 803044, 2290763; 802850, 2290709; 802722, 2290743; 802542, 2290884; 802227, 2291017; 801979, 2291212; 801832, 2291439; 801745, 2291560; 801637, 2291660; 801550, 2291788; 801544, 2291848; 801604, 2291955; 801611, 2292069; 801517, 2292370; 801497, 2292538; 801443, 2292638; 801330, 2292757; 801229, 2292846; 801175, 2293006; 801182, 2293134; 801242, 2293401; 801142, 2293689; 801062, 2294018; return to starting point.

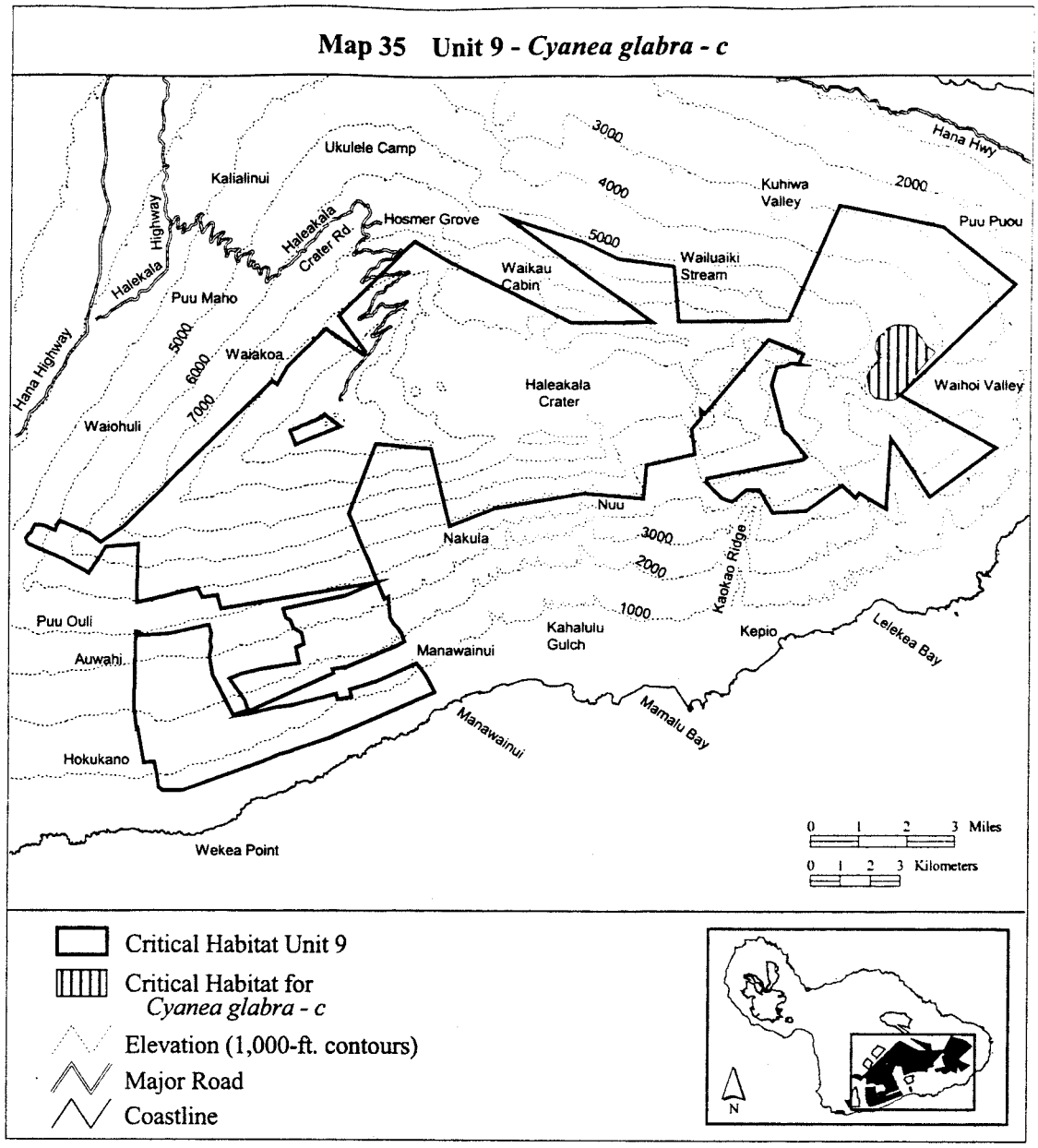
(B) **Note:** Map 34 follows:



(xxxv) Maui 9—*Cyanea glabra*—c (363 ha; 898 ac).

(A) Unit consists of the following 38 boundary points: Start at 805090, 2293218; 805068, 2293196; 805053, 2293181; 805053, 2293180; 804943, 2293067; 804871, 2293032; 804680, 2293002; 804400, 2293049; 804298, 2293049; 804161, 2293121; 804036, 2293276; 804024, 2293342; 803964, 2293634; 803917, 2293843; 803988, 2293950; 804084, 2294076; 804245, 2294261; 804298, 2294398; 804245, 2294571; 804191, 2294750; 804215, 2295007; 804304, 2295144; 804489, 2295275; 804573, 2295394; 804650, 2295454; 804895, 2295550; 805367, 2295538; 805534, 2295460; 805587, 2295365; 805695, 2295150; 805933, 2294828; 806166, 2294684; 806184, 2294631; 806178, 2294595; 805981, 2294362; 805677, 2294016; 805480, 2293718; 805188, 2293318; return to starting point.

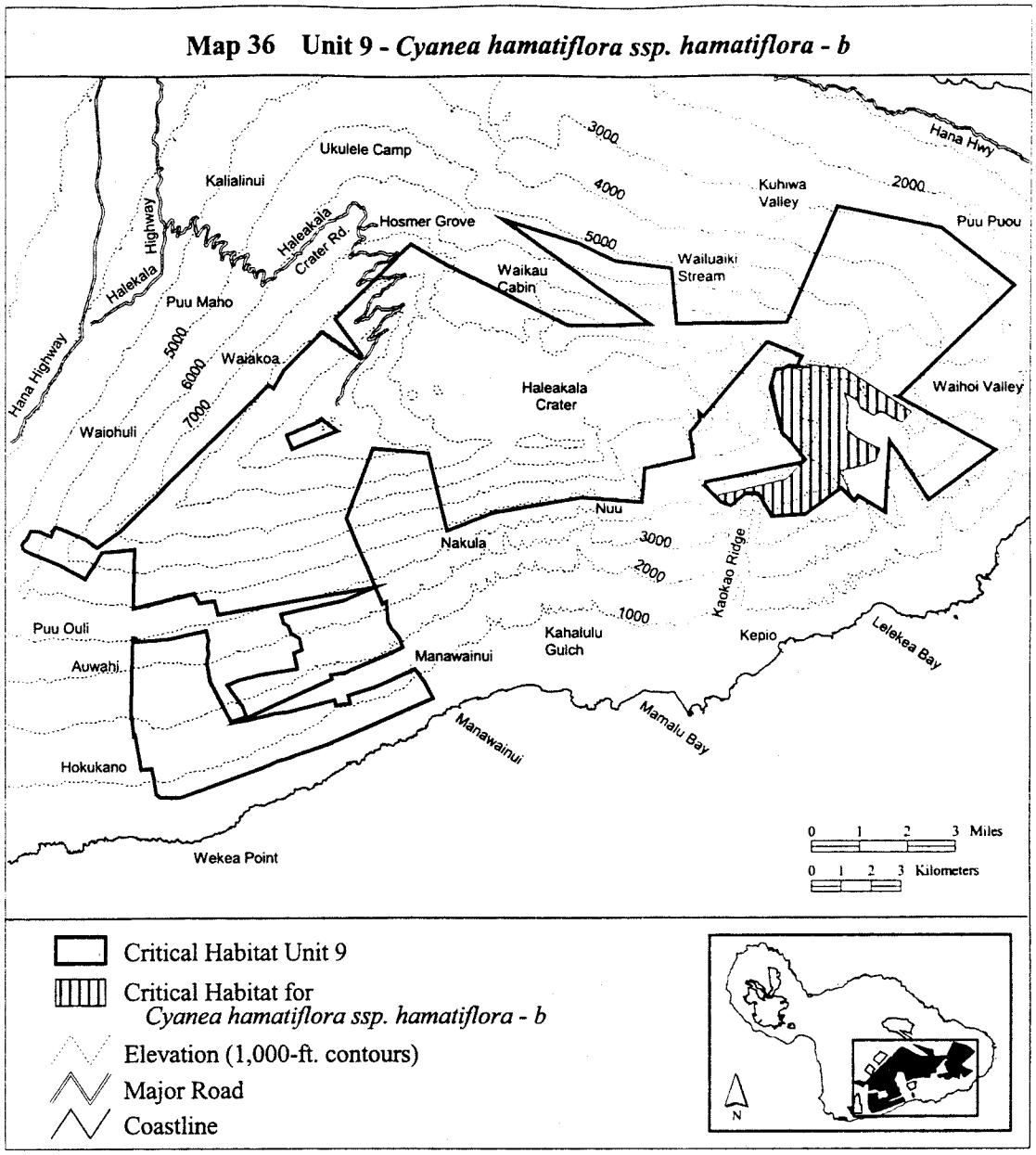
(B) **Note:** Map 35 follows:



(xxxvi) Maui 9—*Cyanea hamatiflora* ssp. *hamatiflora*—b (1,309 ha; 3,235 ac).

(A) Unit consists of the following 34 boundary points: Start at 801996, 2294274; 803261, 2294116; 805475, 2292702; 805159, 2292328; 804474, 2292692; 804184, 2292587; 803762, 2292824; 803635, 2293097; 803235, 2293299; 803340, 2292930; 803288, 2292113; 803657, 2291823; 804421, 2291454; 804289, 2291058; 803920, 2290900; 803077, 2290716; 803548, 2289729; 803114, 2290141; 801935, 2289265; 800788, 2289185; 800516, 2289662; 800342, 2289966; 799912, 2289966; 799418, 2289552; 799034, 2289728; 799006, 2289910; 801285, 2290452; 801917, 2291085; 801678, 2291389; 801153, 2292060; 800860, 2293524; 801185, 2294156; 801306, 2294225; 801759, 2294089; return to starting point.

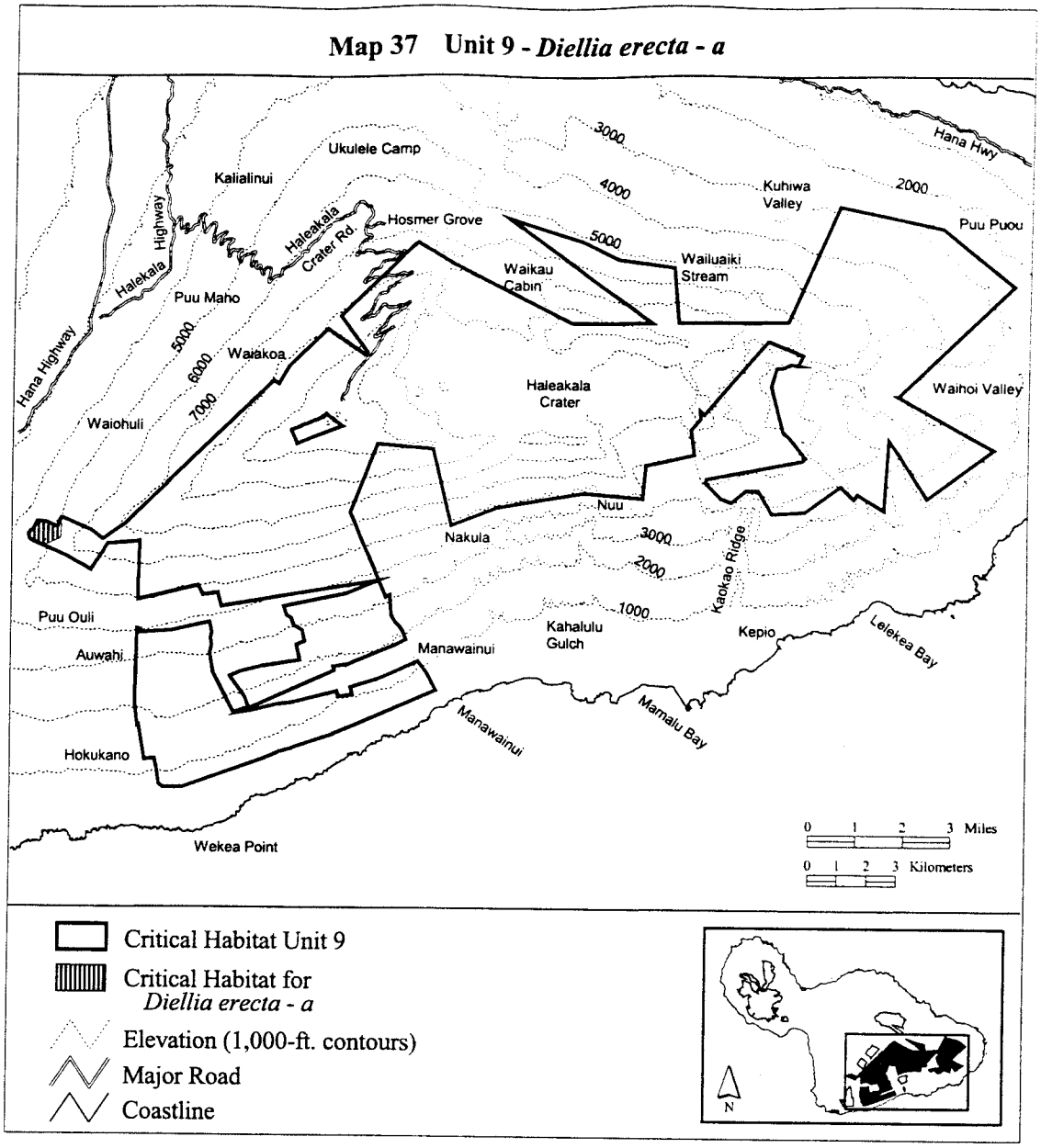
(B) **Note:** Map 36 follows:



(xxxvii) Maui 9—*Diellia erecta*—a (2 ha; 5 ac).

(A) Unit consists of the following 9 boundary points: Start at 776678, 2288562; 776714, 2288648; 776729, 2288680; 776747, 2288719; 776756, 2288719; 776808, 2288717; 776832, 2288598; 776823, 2288519; 776820, 2288498; return to starting point.

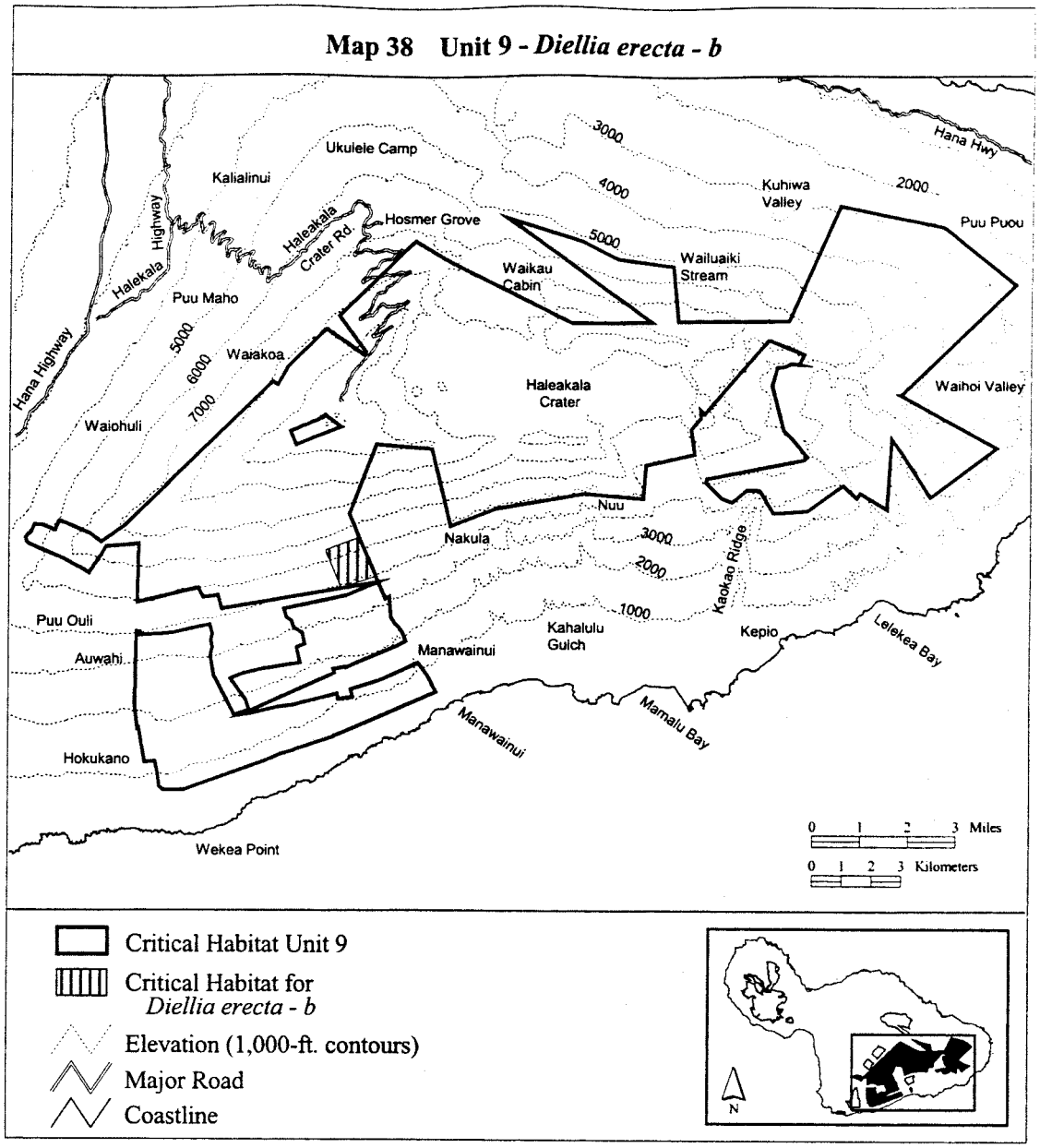
(B) **Note:** Map 37 follows:



(xxxviii) Maui 9—*Diellia erecta*—b (175 ha; 431 ac).

(A) Unit consists of the following 9 boundary points: Start at 787240, 2287564; 787475, 2287007; 786302, 2286613; 785862, 2287663; 785861, 2287662; 785789, 2287851; 785769, 2287902; 785806, 2287916; 786914, 2288334; return to starting point.

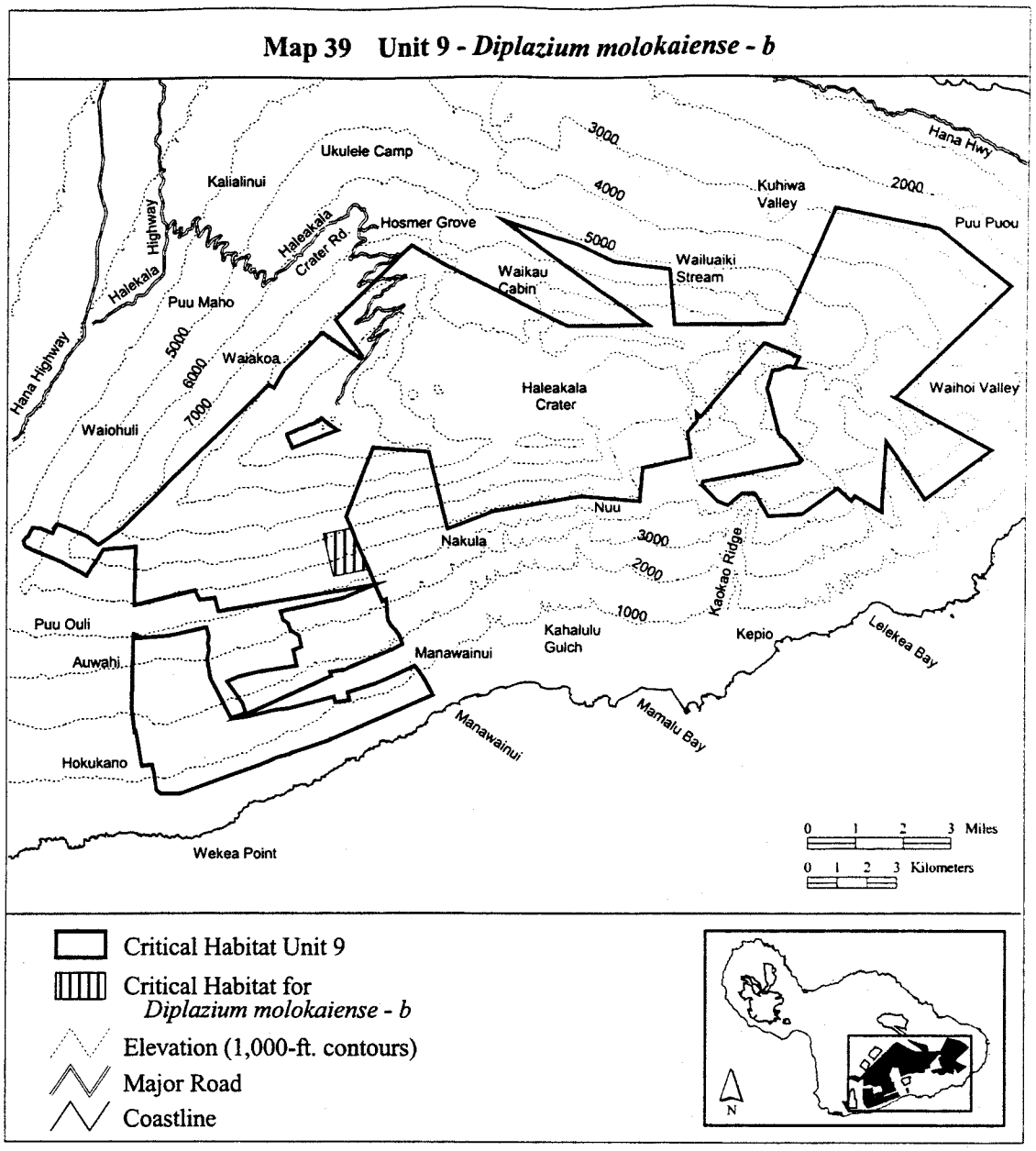
(B) **Note:** Map 38 follows:



(xxxix) Maui 9—*Diplazium molokaiense*—b (162 ha; 401 ac).

(A) Unit consists of the following 4 boundary points: Start at 786149, 2287088; 785806, 2288547; 786747, 2288730; 787339, 2287329; return to starting point.

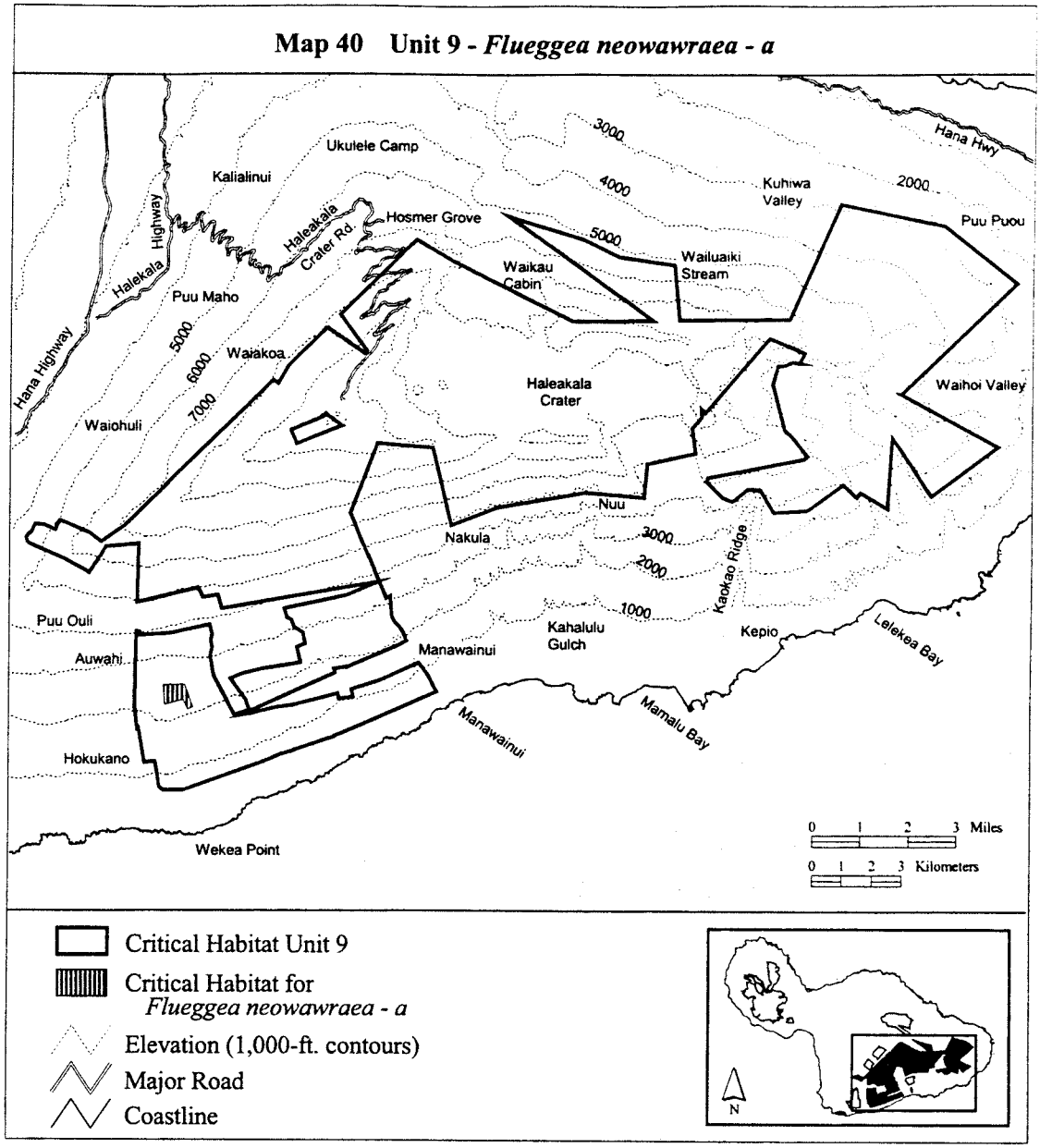
(B) **Note:** Map 39 follows:



(xl) Maui 9—*Flueggea neowawraea*—a (52 ha; 128 ac).

(A) Unit consists of the following 6 boundary points: Start at 780345, 2283357; 781056, 2283374; 781342, 2282594; 781160, 2282542; 781012, 2282863; 780388, 2282689; return to starting point.

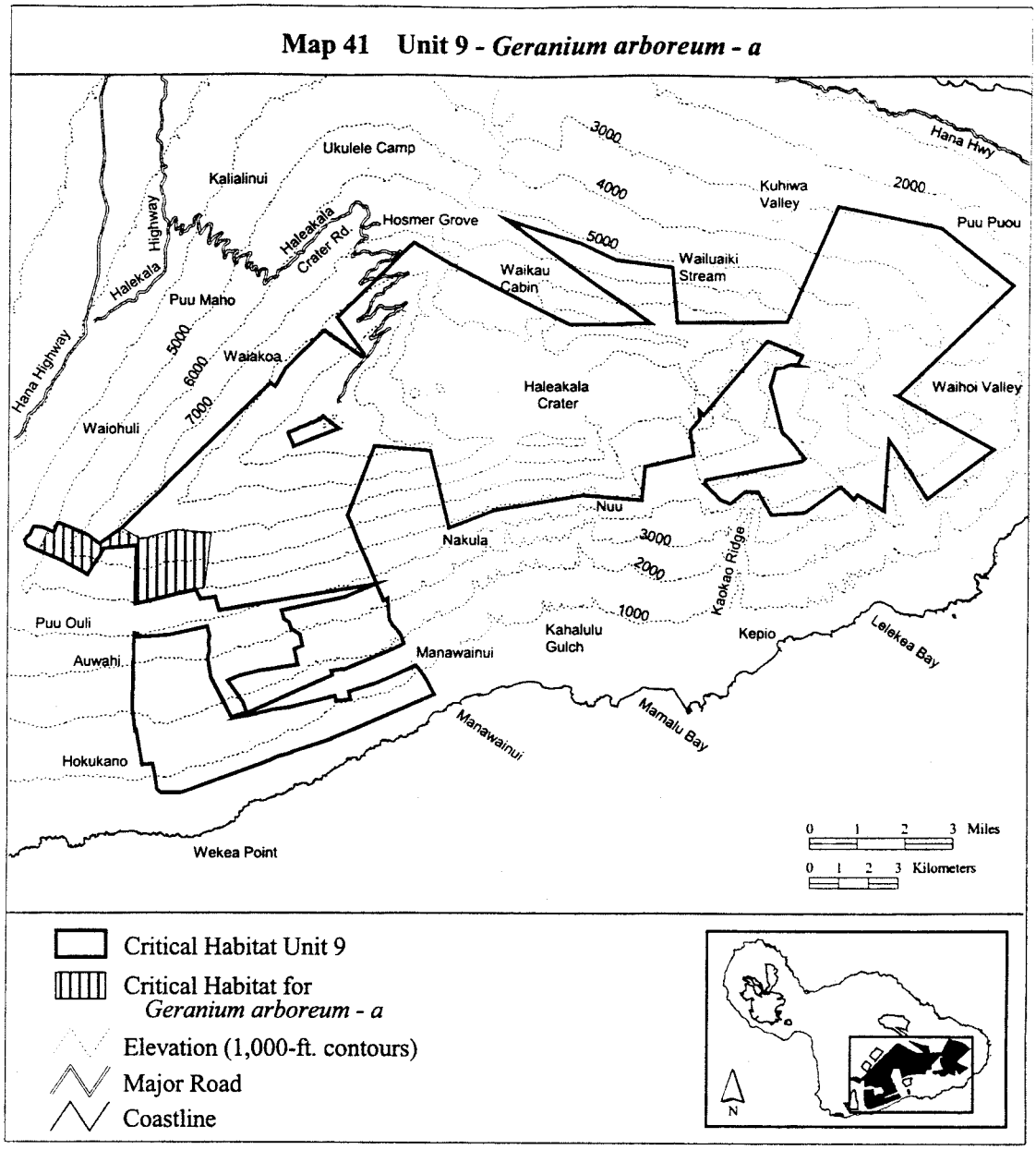
(B) **Note:** Map 40 follows:



(xli) Maui 9—*Geranium arboreum*—a (731 ha; 1,805 ac).

(A) Unit consists of the following 78 boundary points: Start at 776678, 2288562; 776714, 2288648; 776729, 2288680; 776769, 2288768; 776801, 2288841; 776816, 2288873; 776823, 2288888; 776854, 2288875; 776994, 2288817; 777437, 2288634; 777736, 2288504; 777822, 2288467; 778221, 2288151; 778821, 2288569; 778986, 2288684; 779630, 2288318; 780757, 2288633; 782012, 2288542; 781788, 2286699; 781485, 2286623; 779450, 2286115; 779447, 2286116; 779447, 2286118; 779447, 2286148; 779449, 2286273; 779451, 2286428; 779453, 2286528; 779457, 2286767; 779463, 2287069; 779466, 2287187; 779469, 2287405; 779474, 2287664; 779478, 2287896; 779480, 2288005; 779481, 2288094; 779481, 2288097; 779480, 2288099; 779379, 2288090; 779098, 2288064; 778964, 2288051; 778864, 2288041; 778675, 2288023; 778485, 2288006; 778407, 2287998; 778397, 2287997; 778396, 2287997; 778295, 2287839; 778290, 2287830; 778201, 2287689; 778141, 2287597; 778127, 2287576; 778122, 2287567; 778097, 2287528; 778072, 2287490; 778051, 2287458; 778008, 2287395; 777941, 2287295; 777929, 2287273; 777926, 2287268; 777872, 2287190; 777820, 2287111; 777670, 2287202; 777221, 2287452; 776983, 2287585; 776726, 2287694; 776756, 2287770; 776817, 2287928; 776860, 2288037; 776871, 2288068; 776895, 2288122; 776938, 2288237; 776979, 2288341; 777002, 2288401; 777006, 2288411; 777006, 2288412; 777006, 2288413; 777005, 2288413; 777005, 2288414; return to starting point.

(B) **Note:** Map 41 follows:

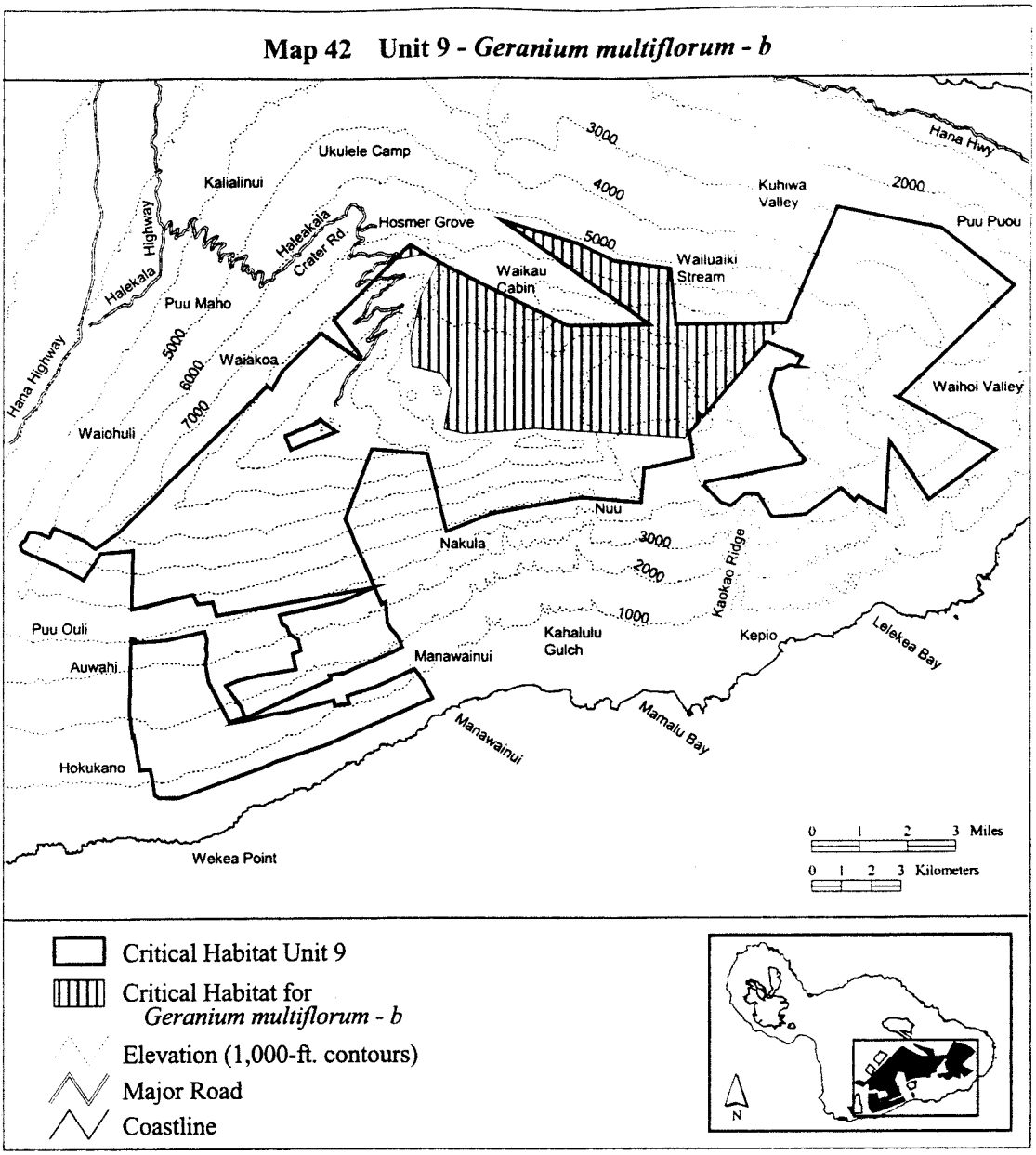


(xlii) Maui 9—*Geranium multiflorum*—b (4,817 ha; 11,903 ac).

(A) Unit consists of the following 155 boundary points: Start at 788163, 2297782; 788209, 2297823; 788474, 2298061; 788549, 2298128; 788563, 2298140; 788752, 2298310; 788754, 2298309; 788785, 2298291; 788906, 2298219; 788934, 2298204; 788940, 2298201; 788945, 2298198; 788965, 2298185; 789012, 2298158; 789097, 2298111; 789125, 2298094; 789154, 2298077; 789279, 2298004; 789310, 2297986; 789342, 2297969; 789450, 2297905; 789495, 2297879; 789521, 2297863; 789656, 2297787; 789683, 2297771; 789712, 2297753; 789841, 2297681; 789867, 2297664; 789901, 2297645; 789955, 2297614; 790033, 2297574; 790061, 2297560; 790093, 2297545; 790216, 2297485; 790249, 2297467; 790279, 2297452; 790304, 2297441; 790412, 2297387; 790443, 2297372; 790472, 2297357; 790581, 2297304; 790633, 2297278; 790637, 2297277; 790638, 2297276; 790666, 2297261; 790712, 2297238; 790778, 2297205; 790851, 2297171; 790865, 2297163; 790992, 2297102; 791049, 2297073; 791253, 2296971; 791748, 2296726; 792093, 2296555; 792239, 2296482; 792302, 2296451; 792444, 2296380; 792449, 2296378; 792490, 2296357; 792655, 2296275; 793070, 2296068; 793303, 2295953; 793307, 2295951; 793422, 2295894; 793425, 2295892; 793482, 2295864; 793485, 2295863; 793542, 2295834; 793701, 2295755; 794013, 2295601; 794376, 2295605; 794739, 2295608; 795102, 2295612; 795523, 2295618; 795945, 2295623; 796322, 2295627; 796366, 2295628; 796367, 2295628; 796710, 2295632; 796712, 2295633; 796712, 2295635; 796322, 2295917; 796064, 2296102; 795805, 2296286; 795412, 2296565; 794929, 2296911; 794586, 2297162; 794089, 2297517; 793843, 2297693; 793840, 2297695; 793717, 2297782; 793715, 2297784; 793592, 2297871; 793096, 2298227; 792850, 2298402; 792846, 2298405; 792724, 2298492; 792721, 2298494; 792661, 2298537; 792659, 2298539; 792630, 2298559; 792627, 2298561; 792614, 2298570; 792612, 2298572; 792606, 2298576; 792604, 2298578; 792602,

2298579; 792600, 2298581; 792599, 2298581; 792395, 2298727; 792392, 2298730; 792290, 2298802; 792288, 2298804; 792238, 2298839; 792236, 2298841; 792212, 2298858; 792210, 2298860; 792199, 2298867; 792197, 2298869; 792193, 2298872; 792190, 2298874; 792187, 2298876; 791820, 2299139; 792911, 2298800; 794323, 2298361; 795561, 2297771; 797414, 2297495; 797590, 2295645; 797591, 2295643; 797602, 2295643; 797615, 2295643; 797793, 2295645; 798243, 2295649; 800429, 2295671; 801112, 2295683; 801148, 2295656; 800620, 2295038; 800619, 2295037; 799580, 2293819; 798494, 2292544; 798490, 2292539; 798357, 2292680; 798374, 2292403; 798056, 2292031; 797894, 2291841; 792958, 2292187; 790618, 2291998; 789902, 2292186; 790128, 2293507; 789788, 2294035; 788807, 2294262; 788770, 2295129; 789109, 2296601; 789675, 2297733; 789185, 2297997; return to starting point.

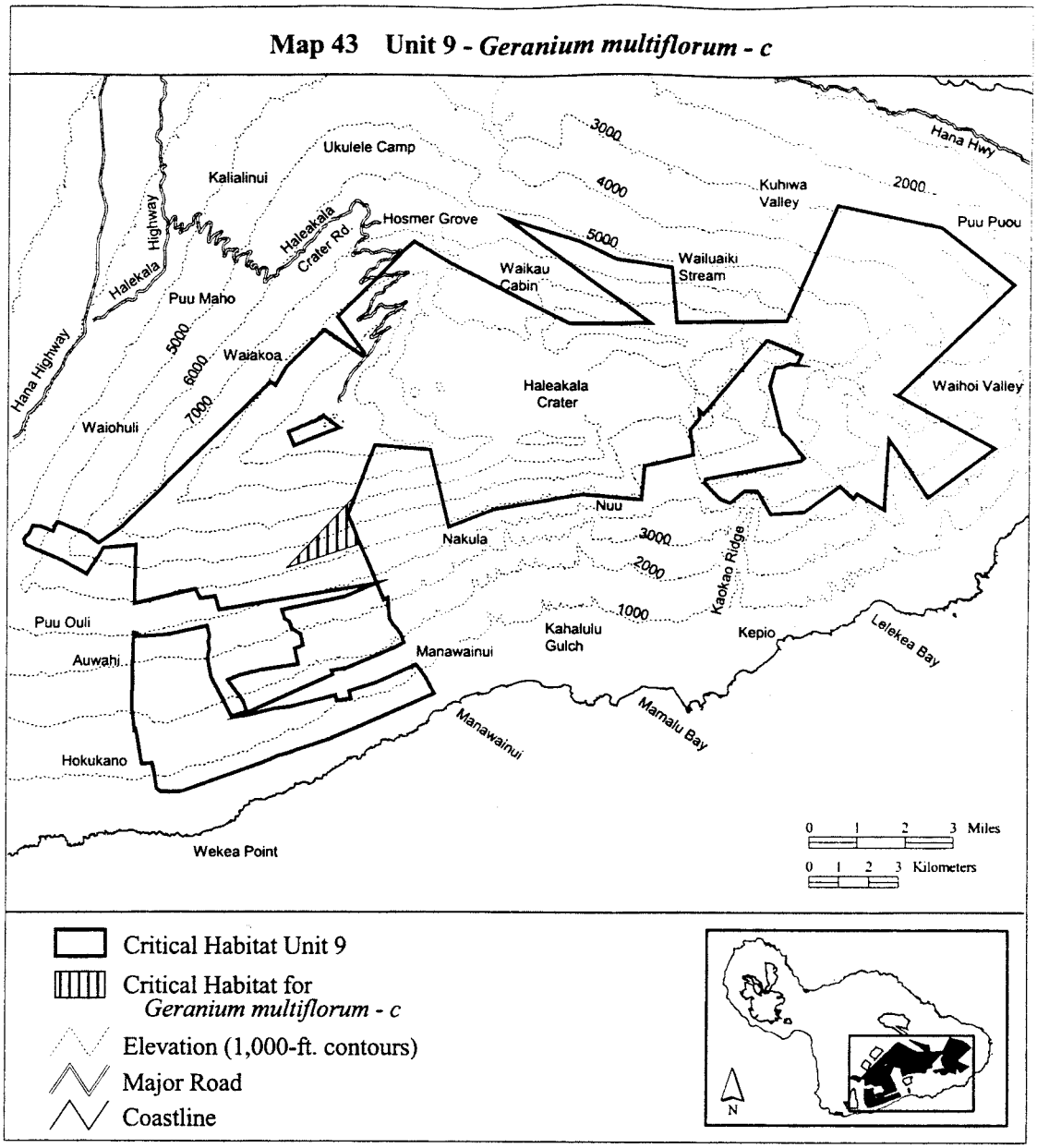
(B) **Note:** Map 42 follows:



(xliii) Maui 9—*Geranium multiflorum*—c (182 ha; 451 ac).

(A) Unit consists of the following 4 boundary points: Start at 786997, 2288137; 784544, 2287319; 786824, 2289775; 786580, 2289125; return to starting point.

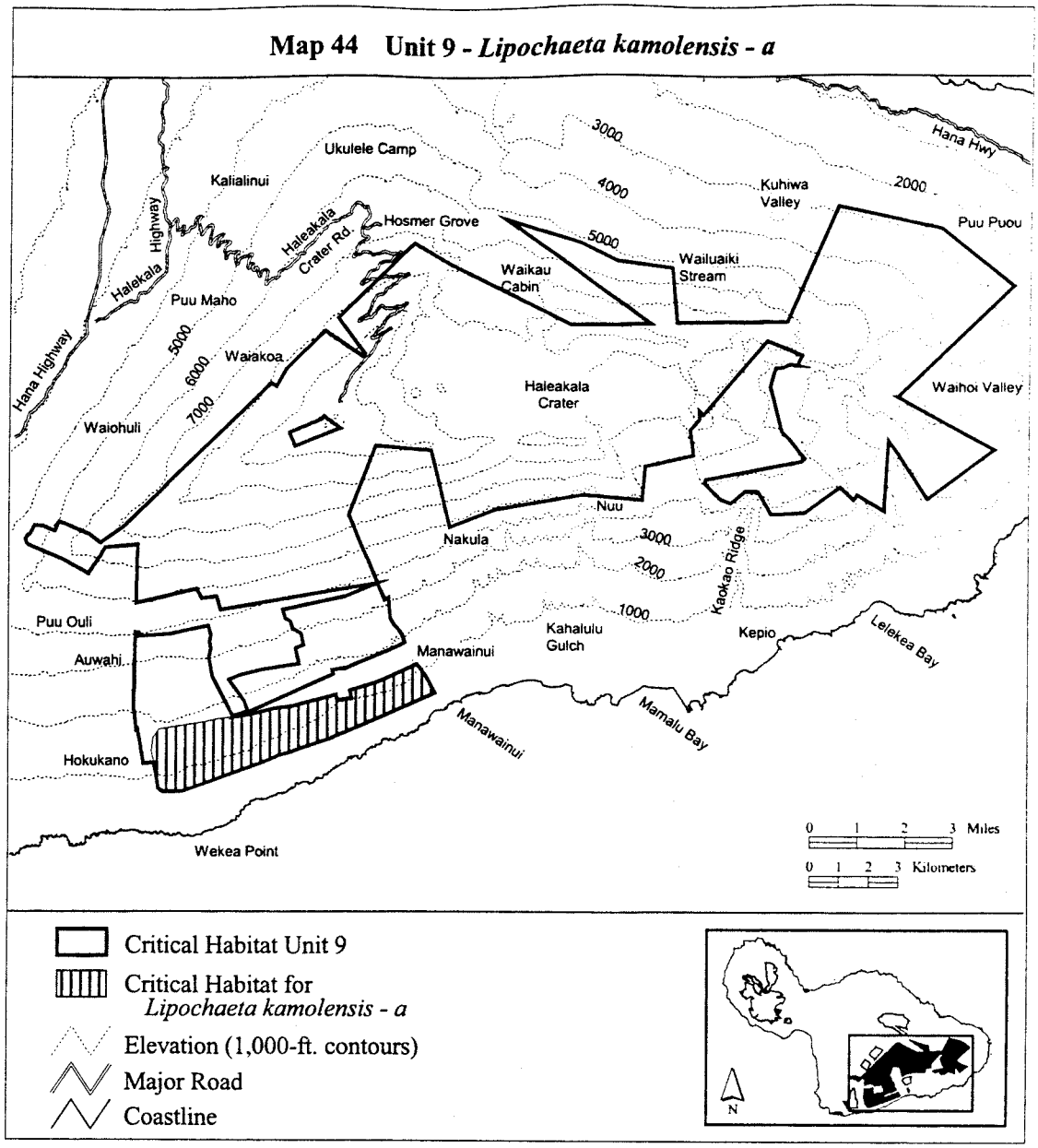
(B) **Note:** Map 43 follows:



(xliv) Maui 9—*Lipochaeta kamolensis*—a (1,475 ha; 3,644 ac).

(A) Unit consists of the following 42 boundary points: Start at 782955, 2282353; 783327, 2282400; 784164, 2282607; 784741, 2282683; 785726, 2282934; 786198, 2283073; 786228, 2282888; 786228, 2282887; 786230, 2282886; 786701, 2282954; 786702, 2282955; 786702, 2282956; 786655, 2283208; 787384, 2283423; 787548, 2283495; 787945, 2283669; 788905, 2284089; 788984, 2283995; 789152, 2283770; 789288, 2283565; 789391, 2283327; 789514, 2283129; 787773, 2282368; 786596, 2281853; 786087, 2281631; 786085, 2281630; 784789, 2281189; 784708, 2281139; 784251, 2281019; 784001, 2280899; 783805, 2280811; 781021, 2279811; 780368, 2279811; 780216, 2279920; 780139, 2280453; 780063, 2280787; 780052, 2280834; 779976, 2281160; 780031, 2281595; 780248, 2281900; 781662, 2282128; 782206, 2282259; return to starting point.

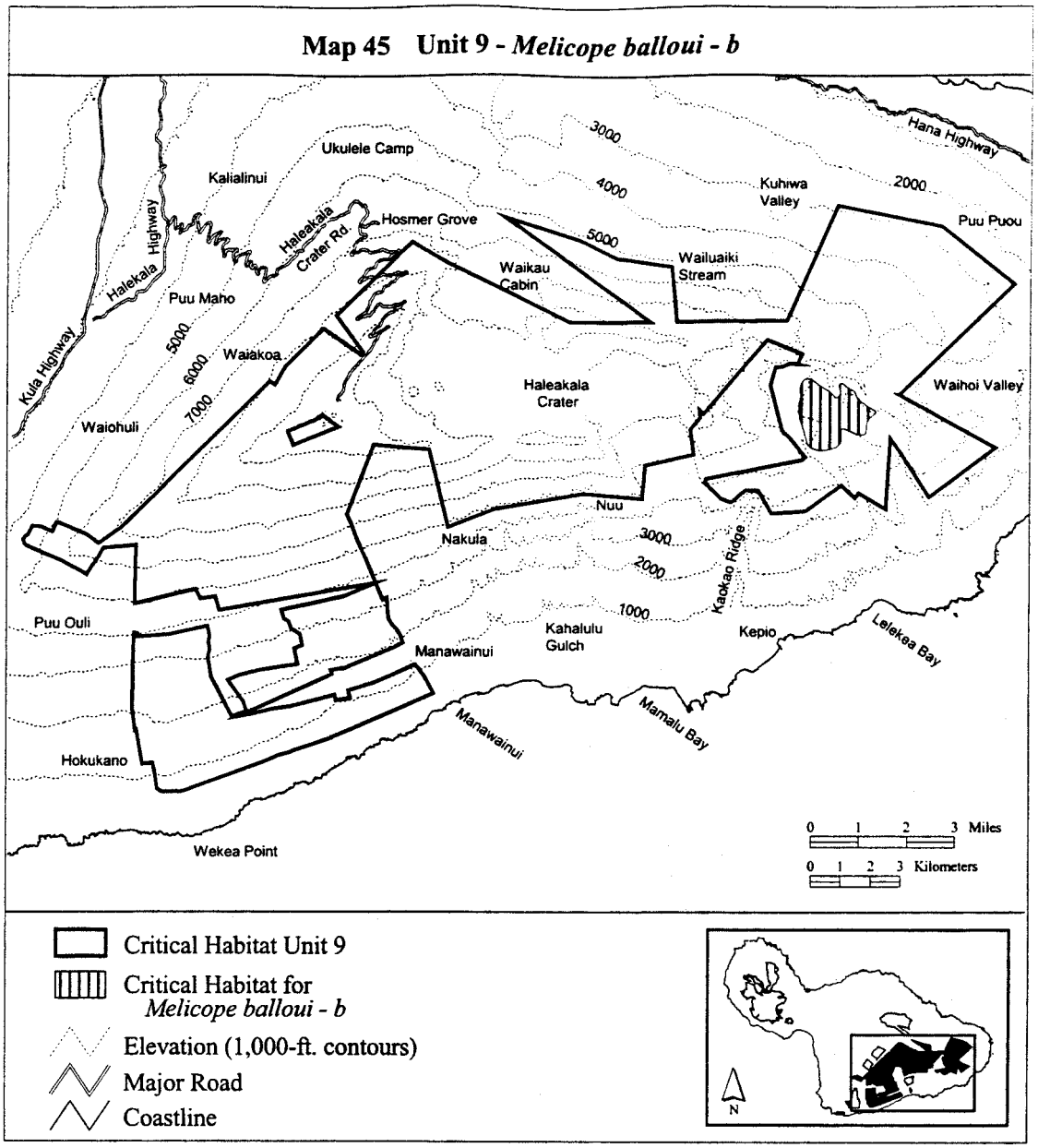
(B) **Note:** Map 44 follows:



(xlv) Maui 9—*Melicope balloui*—b (394 ha; 973 ac).

(A) Unit consists of the following 45 boundary points: Start at 801687, 2292860; 801740, 2293120; 801749, 2293217; 801736, 2293388; 801740, 2293476; 801793, 2293617; 801894, 2293723; 802092, 2293736; 802374, 2293512; 802708, 2293331; 802840, 2293212; 802889, 2293116; 802955, 2293094; 803069, 2293173; 803087, 2293287; 803047, 2293446; 803047, 2293538; 803140, 2293582; 803316, 2293437; 803545, 2293314; 803619, 2293116; 803769, 2292957; 804016, 2292781; 804266, 2292645; 804249, 2292561; 804051, 2292403; 803963, 2292244; 803945, 2292099; 803945, 2291945; 803928, 2291870; 803804, 2291844; 803681, 2291848; 803413, 2291949; 803272, 2292020; 803153, 2292051; 803109, 2292020; 803118, 2291804; 803091, 2291562; 802964, 2291430; 802770, 2291368; 802422, 2291298; 802088, 2291417; 802000, 2291518; 801758, 2292262; 801714, 2292447; return to starting point.

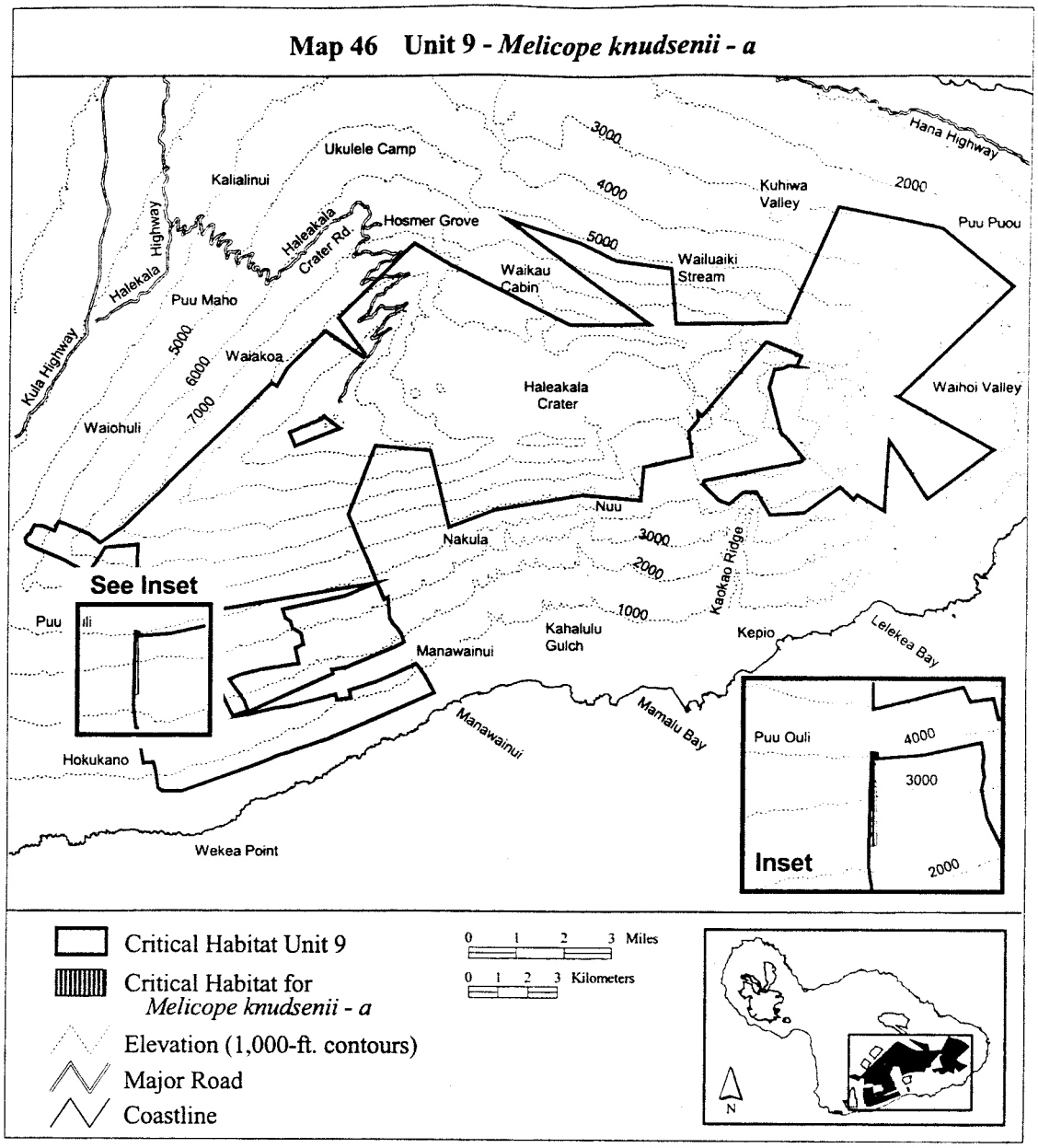
(B) **Note:** Map 45 follows:



(xlvi) Maui 9—Melicope knudsenii—a (28 ha; 69 ac).

(A) Unit consists of the following 26 boundary points: Start at 779378, 2283038; 779379, 2283091; 779379, 2283156; 779384, 2283260; 779385, 2283362; 779386, 2283461; 779389, 2283570; 779391, 2283672; 779394, 2283769; 779397, 2283858; 779397, 2283869; 779397, 2283875; 779398, 2283992; 779401, 2284094; 779401, 2284203; 779403, 2284241; 779406, 2284322; 779408, 2284377; 779408, 2284385; 779408, 2284390; 779413, 2284560; 779419, 2284768; 779424, 2285004; 779427, 2285134; 779523, 2285126; 779547, 2283051; return to starting point.

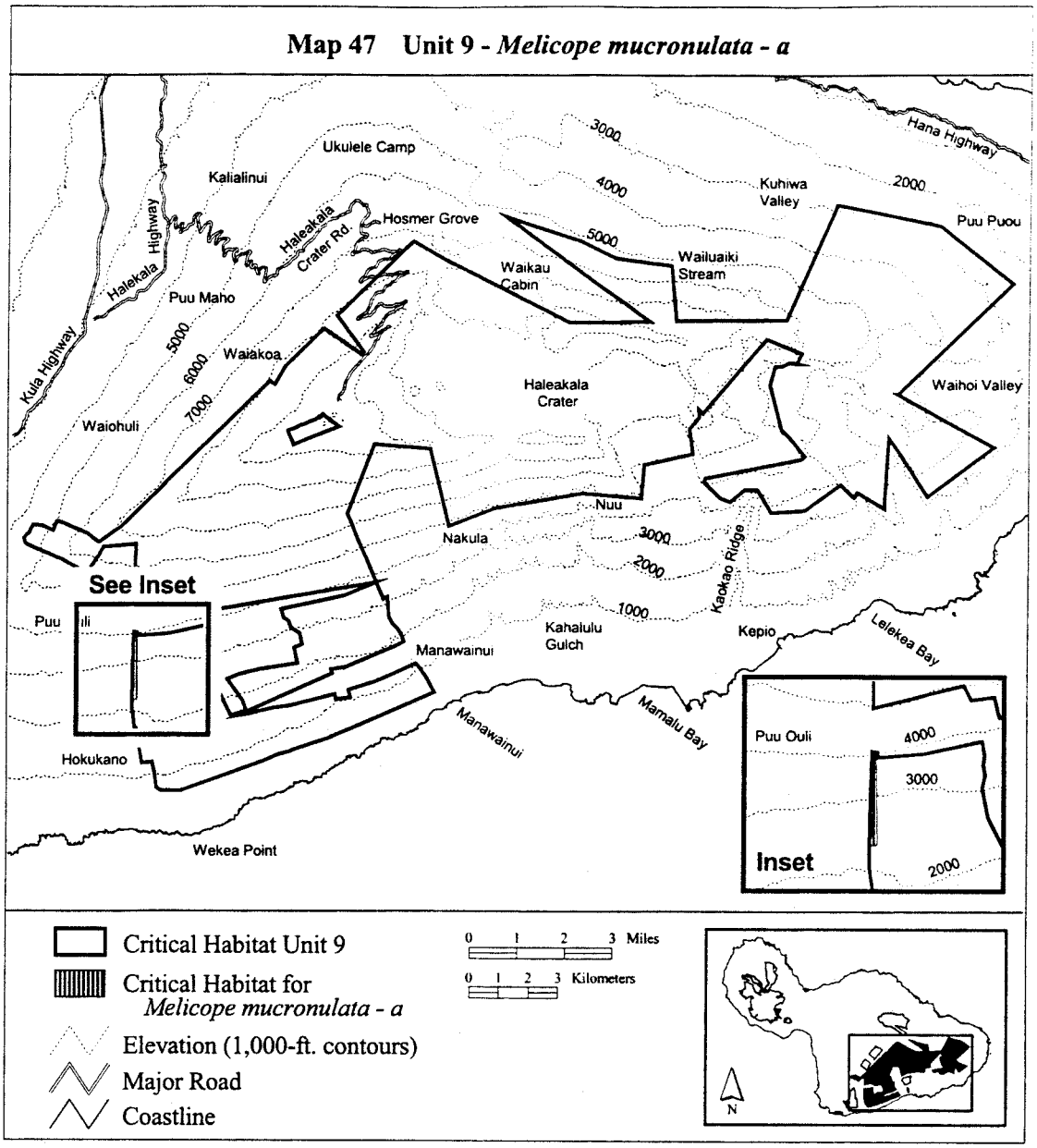
(B) **Note:** Map 46 follows:



(xlvii) Maui 9—*Melicope mucronulata*—a (34 ha; 83 ac).

(A) Unit consists of the following 23 boundary points: Start at 779374, 2282861; 779377, 2282926; 779379, 2283091; 779379, 2283156; 779384, 2283260; 779385, 2283362; 779386, 2283461; 779389, 2283570; 779391, 2283672; 779394, 2283769; 779397, 2283875; 779398, 2283992; 779401, 2284094; 779401, 2284203; 779403, 2284241; 779406, 2284322; 779413, 2284560; 779419, 2284768; 779424, 2285004; 779427, 2285144; 779552, 2285134; 779552, 2285008; 779544, 2282873; return to starting point.

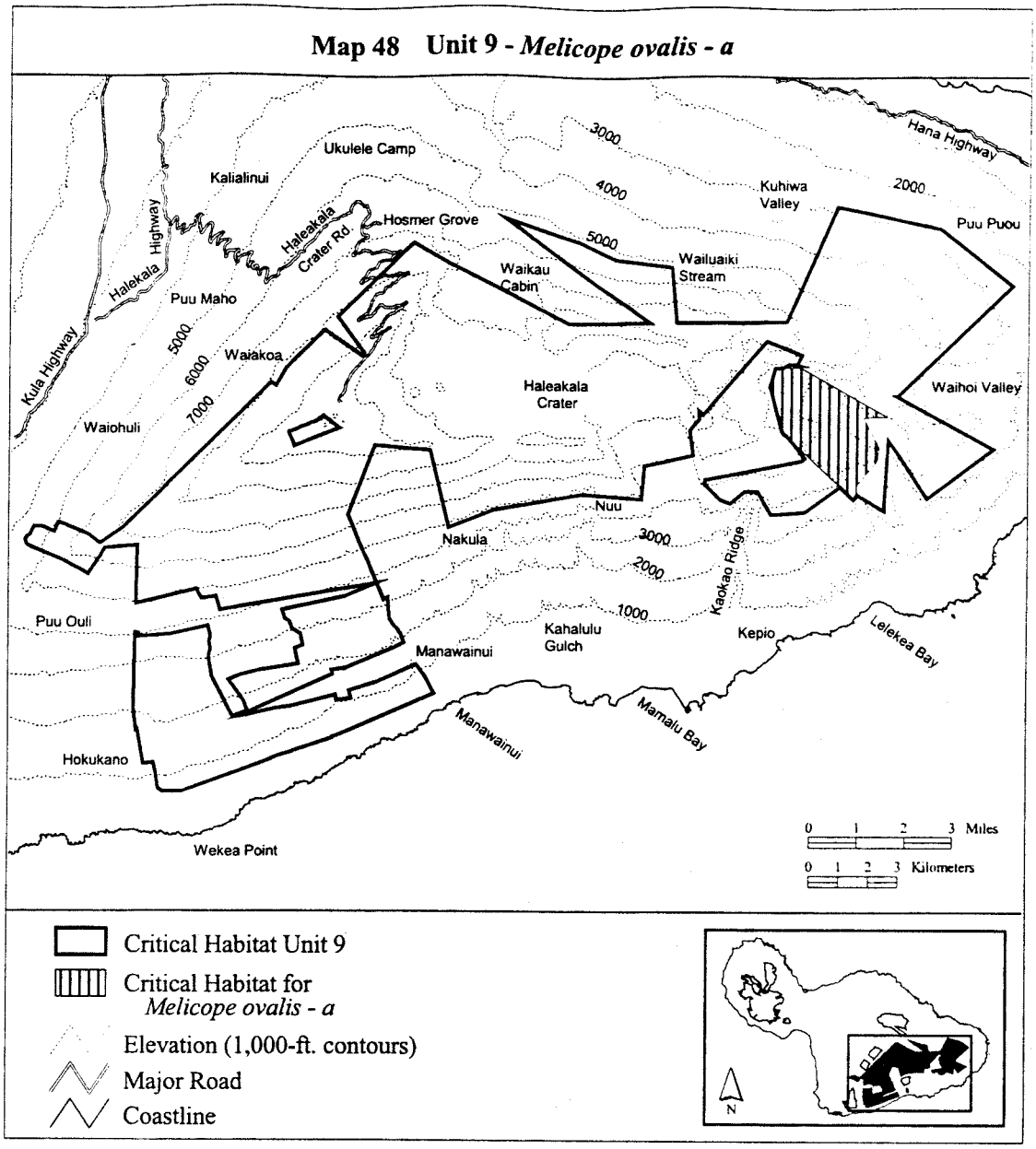
(B) **Note:** Map 47 follows:



(xlviii) Maui 9—*Melicope ovalis*—a (933 ha; 2,306 ac).

(A) Unit consists of the following 18 boundary points: Start at 803684, 2289877; 803574, 2289704; 803114, 2290141; 803112, 2290139; 801383, 2291766; 801145, 2291990; 800743, 2293514; 800900, 2294126; 801146, 2294134; 801147, 2294134; 801148, 2294134; 801758, 2294144; 804700, 2292498; 804245, 2292498; 803895, 2292463; 804438, 2291482; 804352, 2291008; 803667, 2290169; return to starting point.

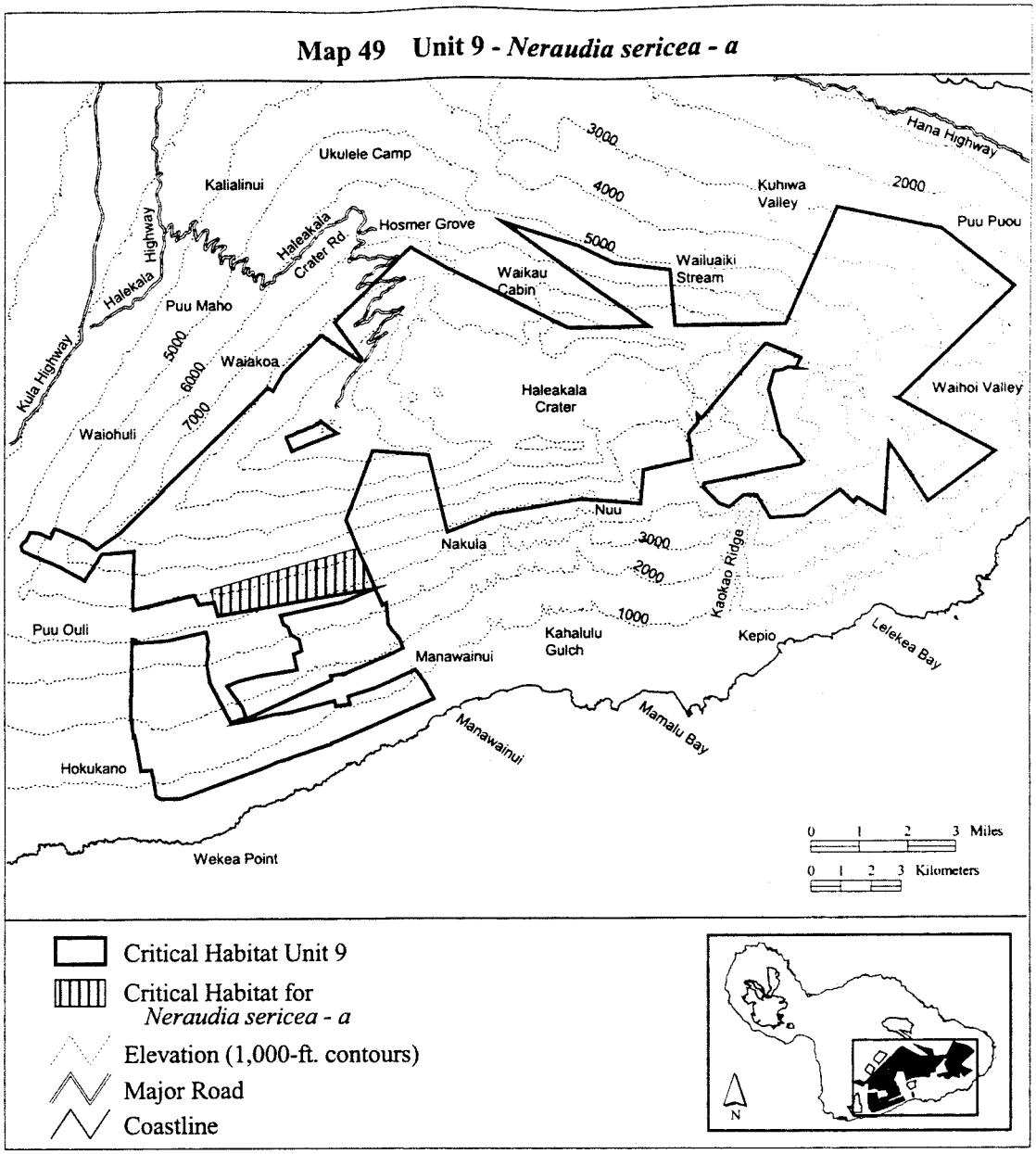
(B) **Note:** Map 48 follows:



(xlix) Maui 9—*Neraudia sericea*—a (623 ha; 1,540 ac).

(A) Unit consists of the following 7 boundary points: Start at 787503, 2286804; 782284, 2285907; 782162, 2286366; 782046, 2286802; 786980, 2288178; 787198, 2287662; 787557, 2286813; return to starting point.

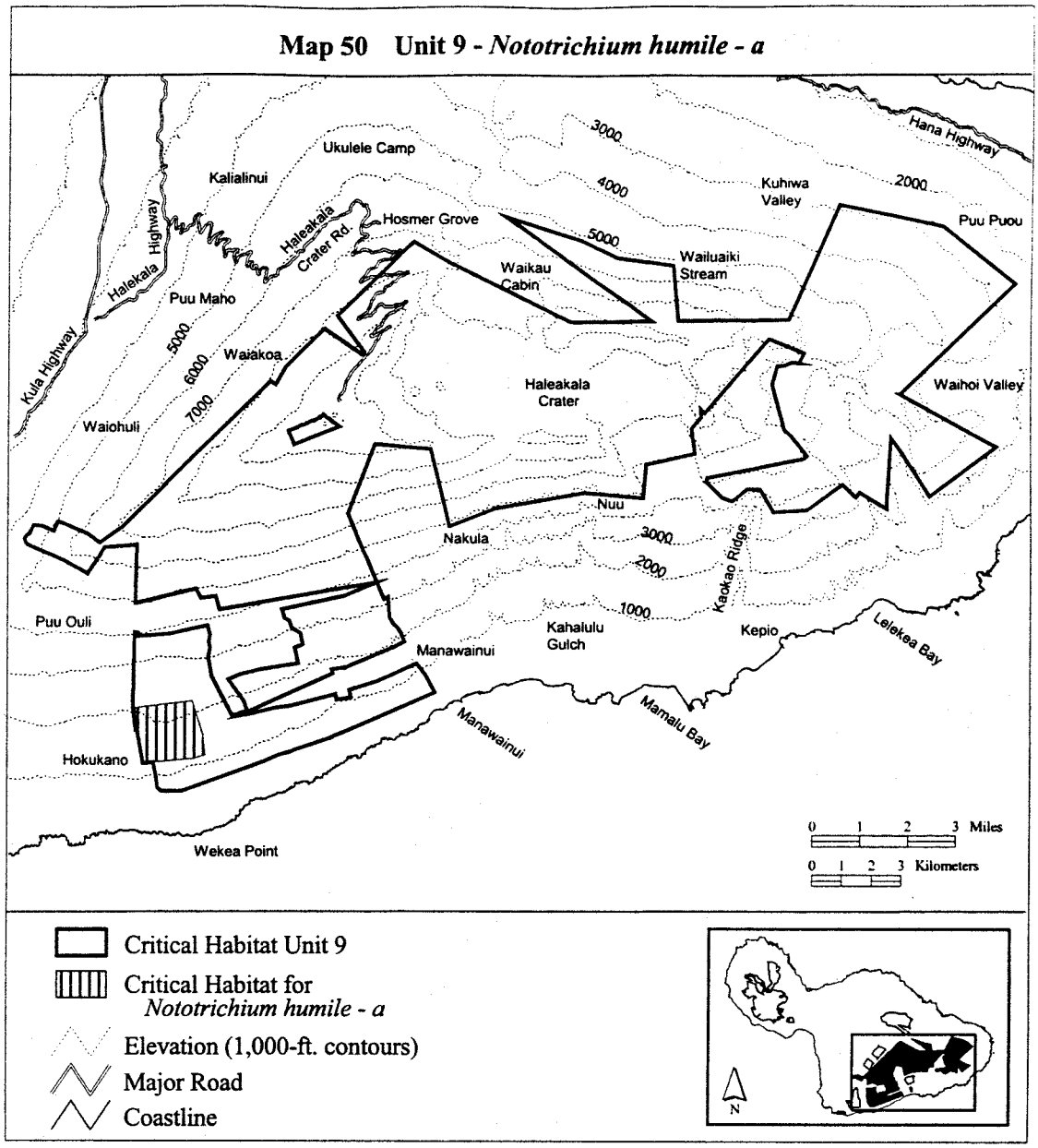
(B) **Note:** Map 49 follows:



(l) Maui 9—*Nototrichium humile*—a (398 ha; 982 ac).

(A) Unit consists of the following 9 boundary points: Start at 780063, 2280787; 779707, 2280753; 779507, 2281898; 779466, 2282131; 779455, 2282613; 781370, 2282843; 781731, 2281716; 781818, 2281027; 781425, 2280917; return to starting point.

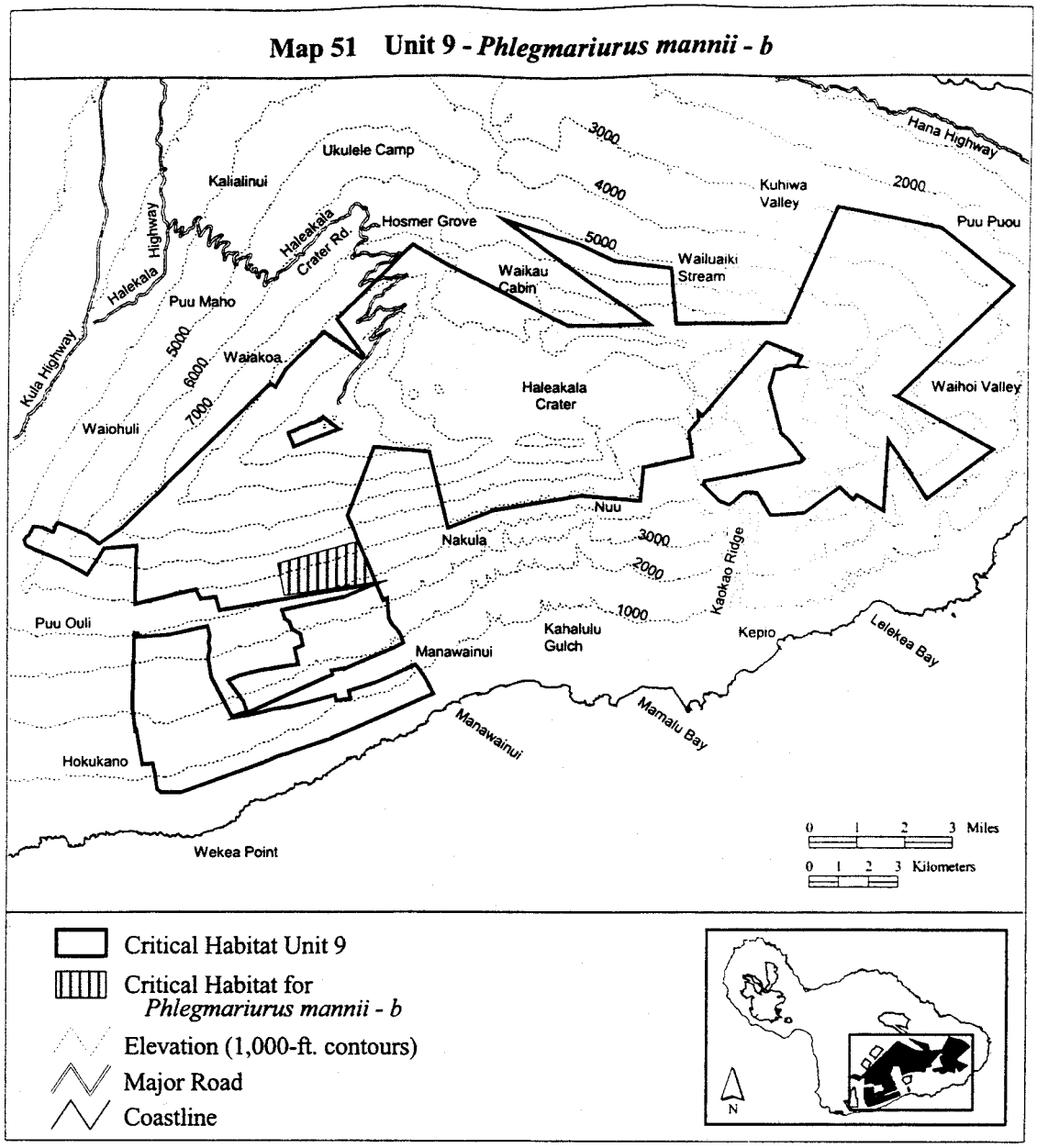
(B)**Note:** Map 50 follows:



(li) Maui 9—*Phlegmariurus mannii*—b (383 ha; 947 ac).

(A) Unit consists of the following 4 boundary points: Start at 787536, 2286861; 784465, 2286413; 784226, 2287486; 786946, 2288260; return to starting point.

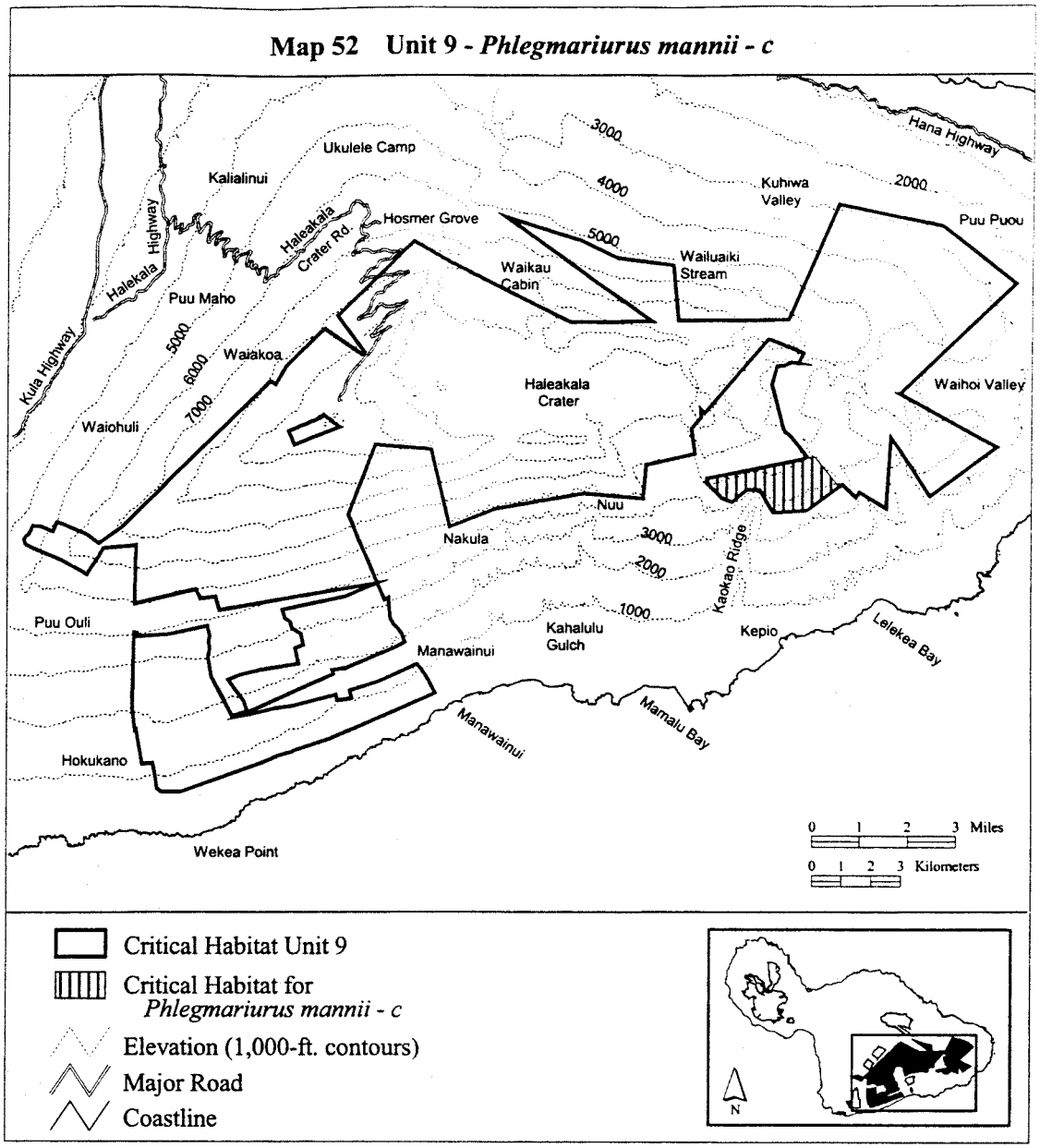
(B) **Note:** Map 51 follows:



(lii) Maui 9—*Phlegmariurus mannii*—c (476 ha; 1,176 ac).

(A) Unit consists of the following 12 boundary points: Start at 801935, 2289265; 800788, 2289185; 800342, 2289966; 799912, 2289966; 799418, 2289552; 799083, 2289679; 799034, 2289728; 798541, 2290221; 798585, 2290346; 801831, 2290999; 802185, 2291070; 803010, 2290064; return to starting point.

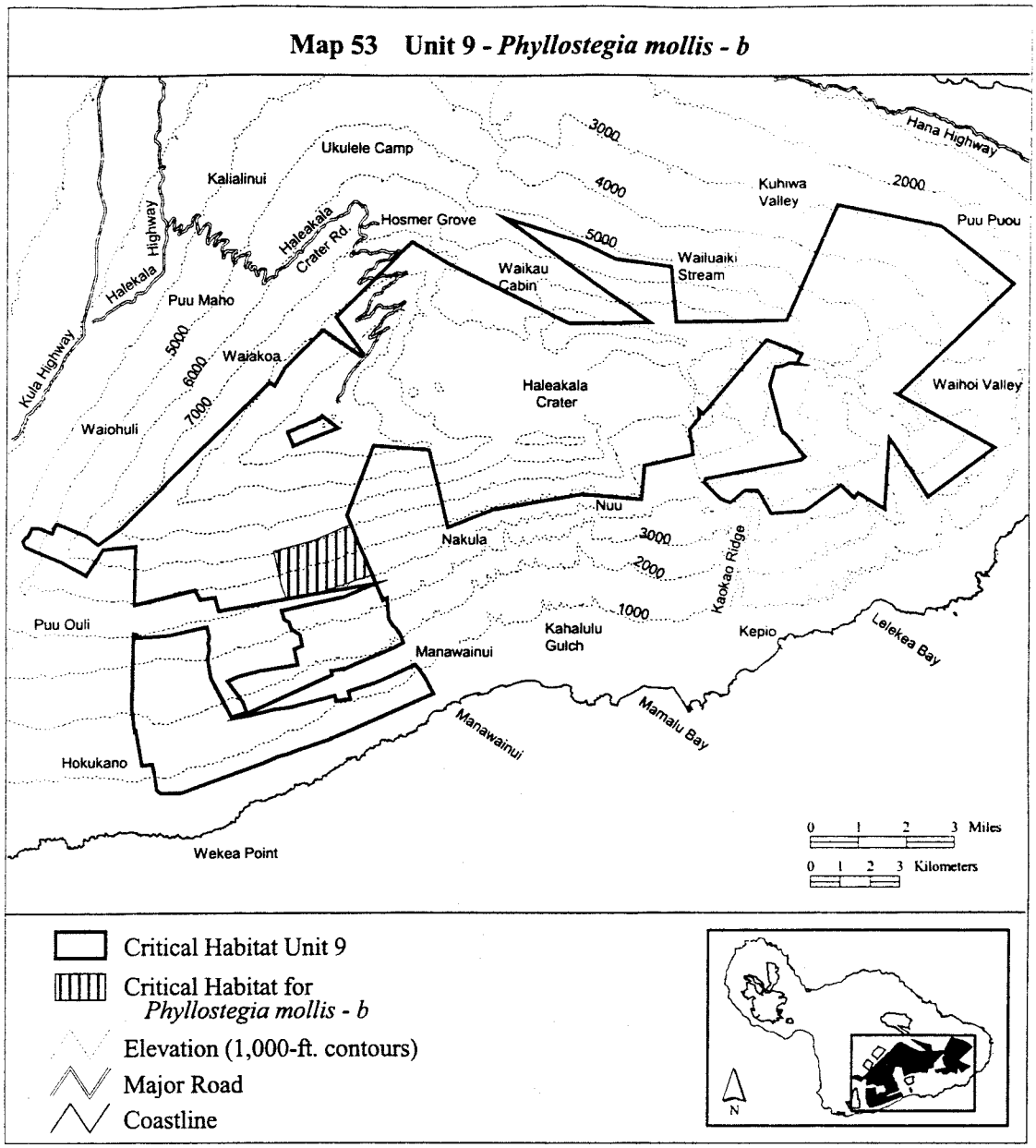
(B) **Note:** Map 52 follows:



(liii) Maui 9—*Phyllostegia mollis*—b (508 ha; 1,256 ac)

(A) Unit consists of the following 9 boundary points: Start at 787430, 2287113; 786267, 2286707; 785468, 2286458; 784537, 2286331; 784388, 2286734; 784109, 2287909; 785061, 2288163; 785507, 2288294; 786709, 2288819; return to starting point.

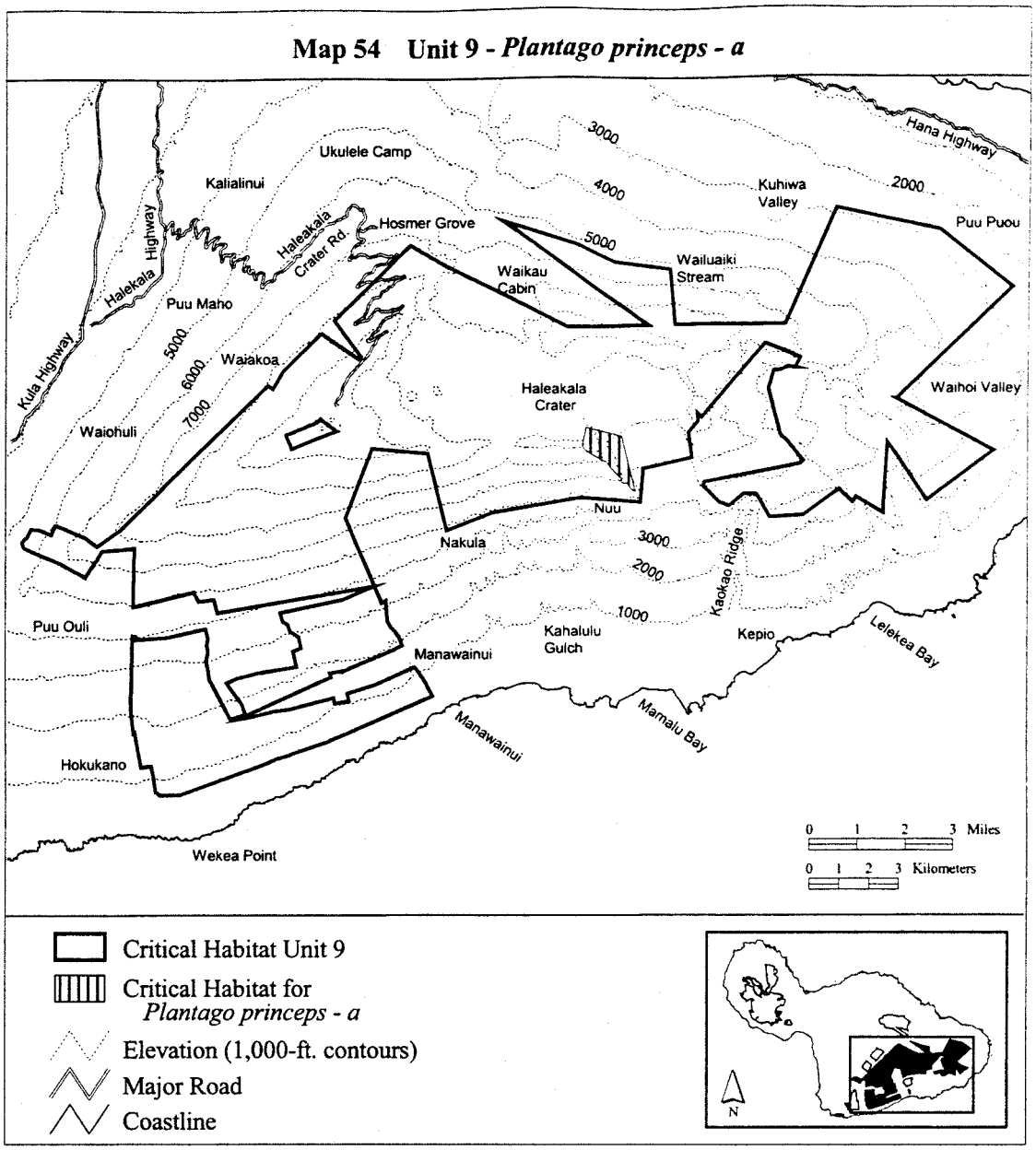
(B) **Note:** Map 53 follows:



(liv) Maui 9—*Plantago princeps*—a (164 ha; 406 ac).

(A) Unit consists of the following 13 boundary points: Start at 794508, 2291589; 794636, 2292209; 795824, 2291911; 796274, 2290033; 796133, 2290112; 796008, 2290304; 795864, 2290318; 795807, 2290385; 795821, 2290462; 795400, 2290907; 795299, 2291051; 795213, 2291075; 794614, 2291434; return to starting point.

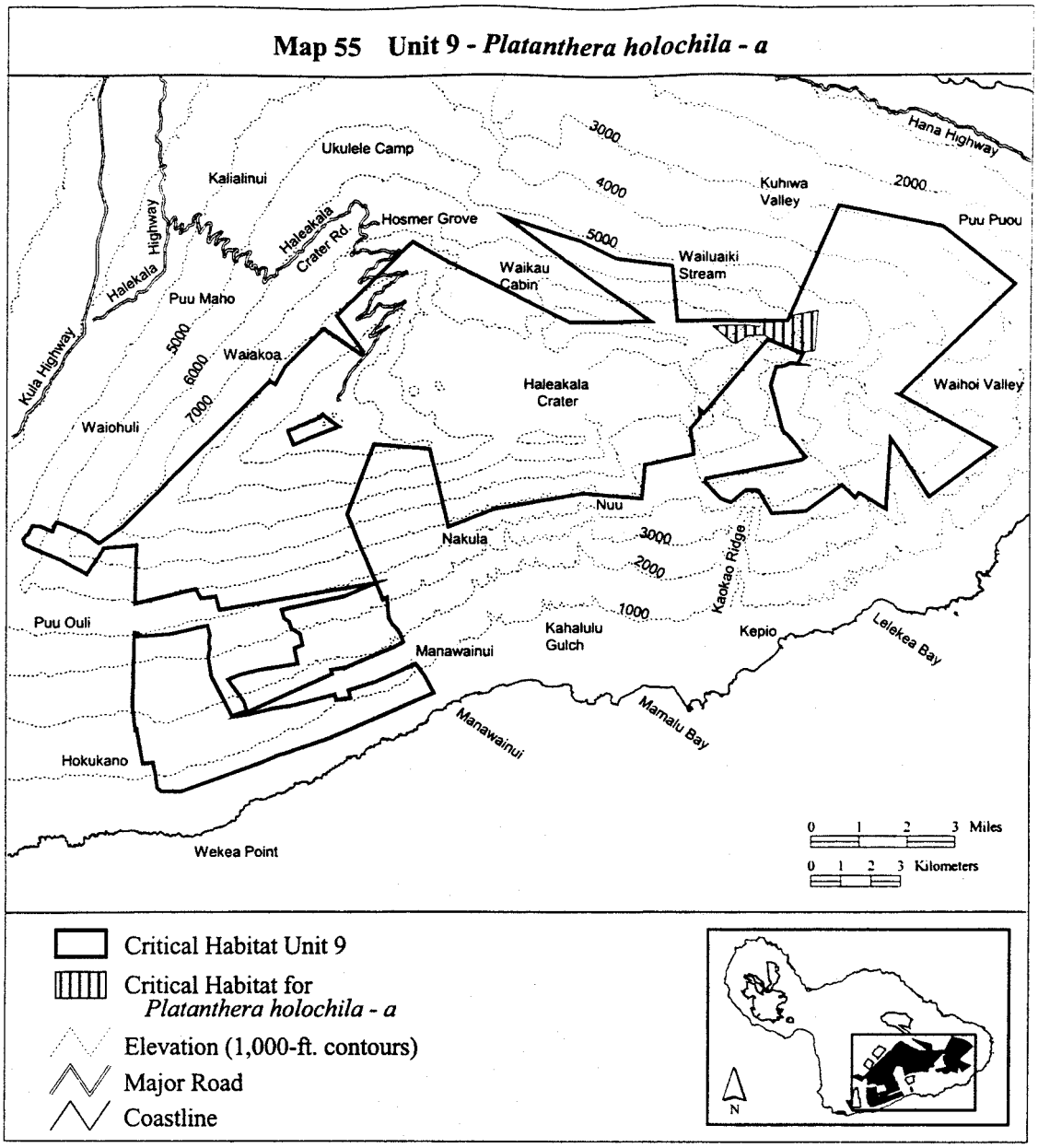
(B) **Note:** Map 54 follows:



(lv) Maui 9—*Platanthera holochila*—a (241 ha; 596 ac).

(A) Unit consists of the following 18 boundary points: Start at 800379, 2295672; 800982, 2295684; 801296, 2295688; 801297, 2295688; 801367, 2295845; 802309, 2296025; 802197, 2294658; 801820, 2294614; 801346, 2294743; 801343, 2294744; 800511, 2295191; 800001, 2295168; 799735, 2294991; 799557, 2294880; 799402, 2294969; 798778, 2295470; 799935, 2295528; 800349, 2295462; return to starting point.

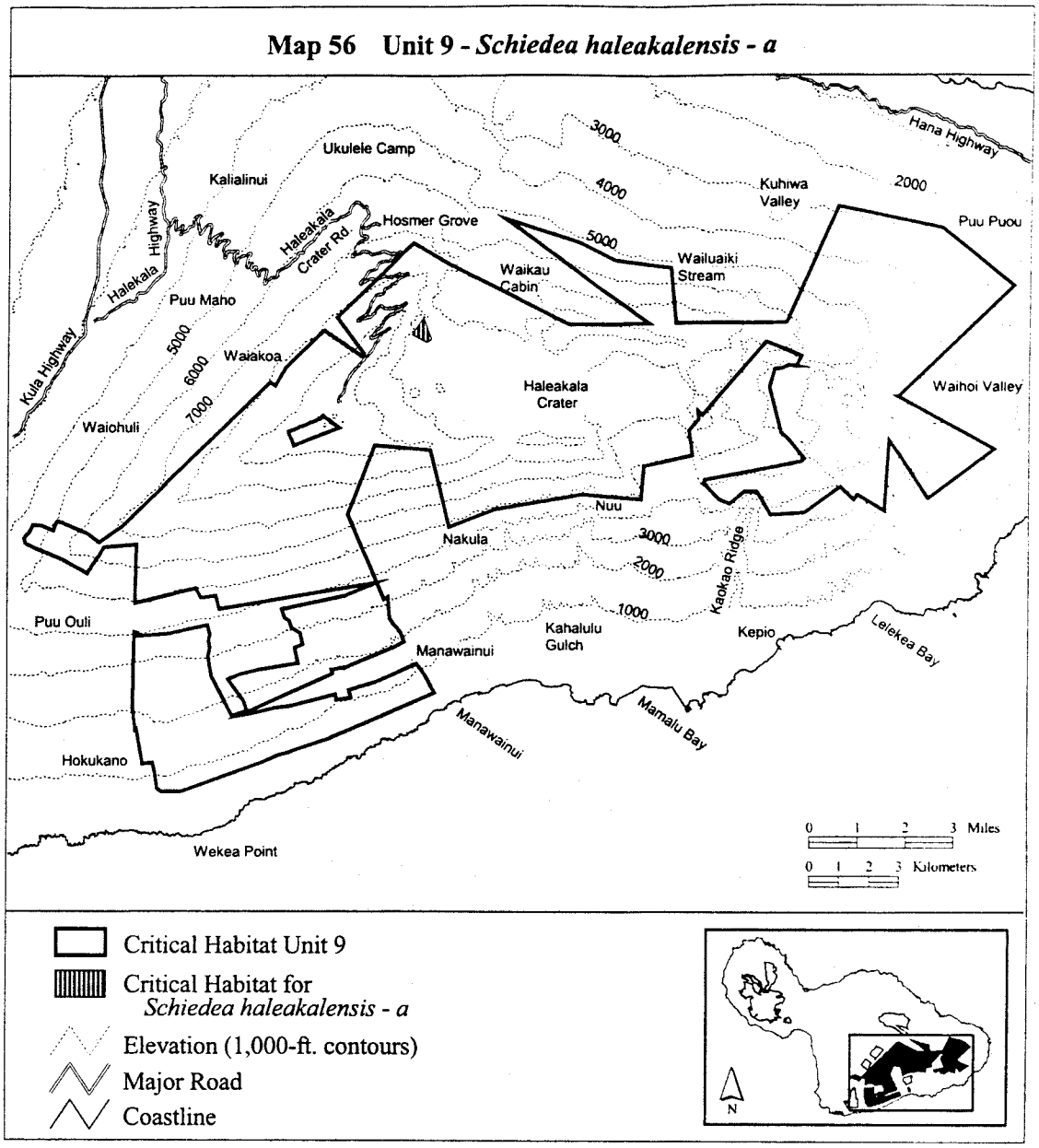
(B) **Note:** Map 55 follows:



(lvi) Maui 9—*Schiedea haleakalensis*—a (26 ha; 64 ac).

(A) Unit consists of the following 4 boundary points: Start at 789350, 2295087; 789223, 2294975; 788711, 2295251; 789089, 2295825; return to starting point.

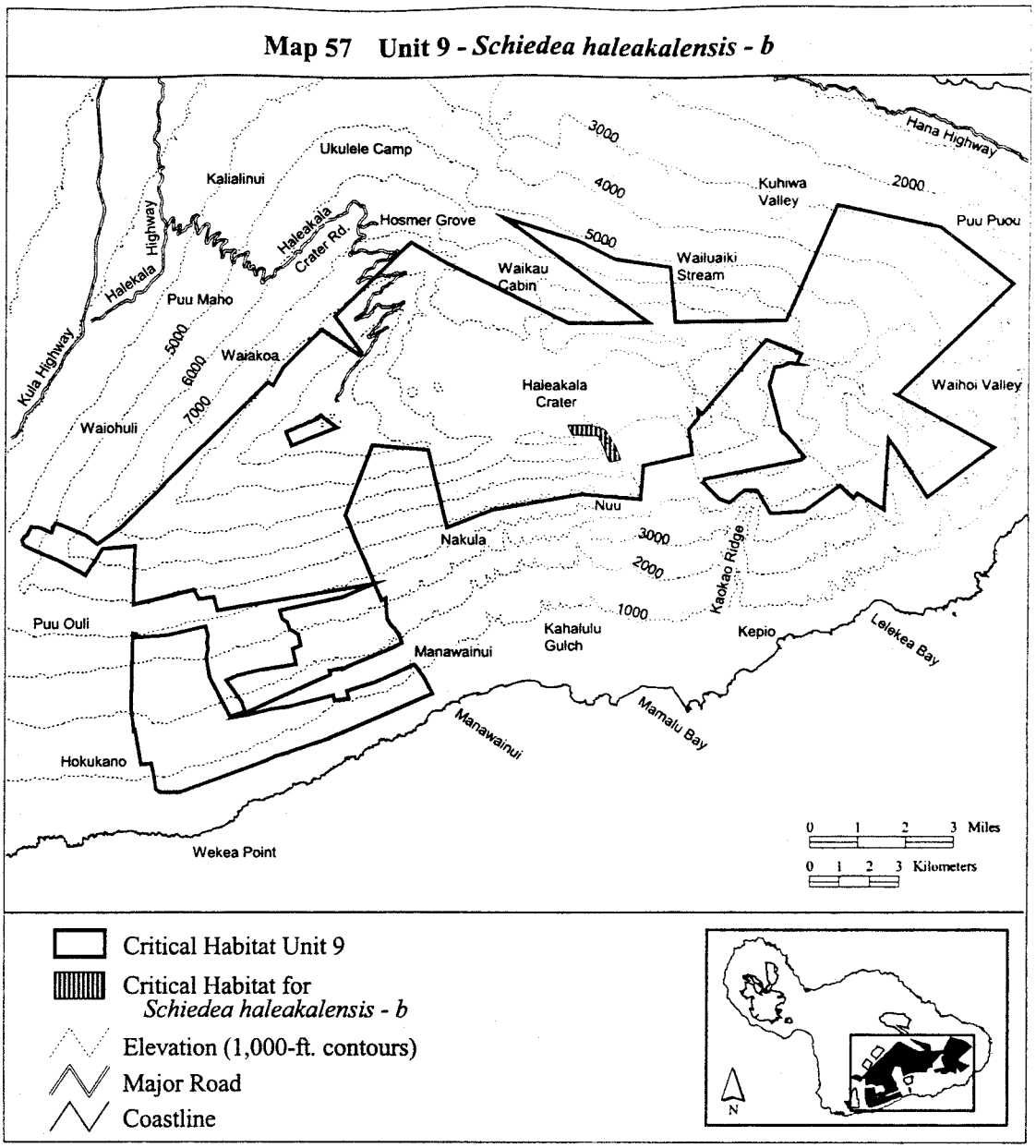
(B) **Note:** Map 56 follows:



(lvii) Maui 9—*Schiedea haleakalensis*—b (77 ha; 189 ac).

(A) Unit consists of the following 8 boundary points: Start at 794791, 2292187; 795274, 2292032; 795602, 2291475; 795788, 2291001; 795397, 2290929; 795031, 2291796; 794146, 2291863; 793984, 2292184; return to starting point.

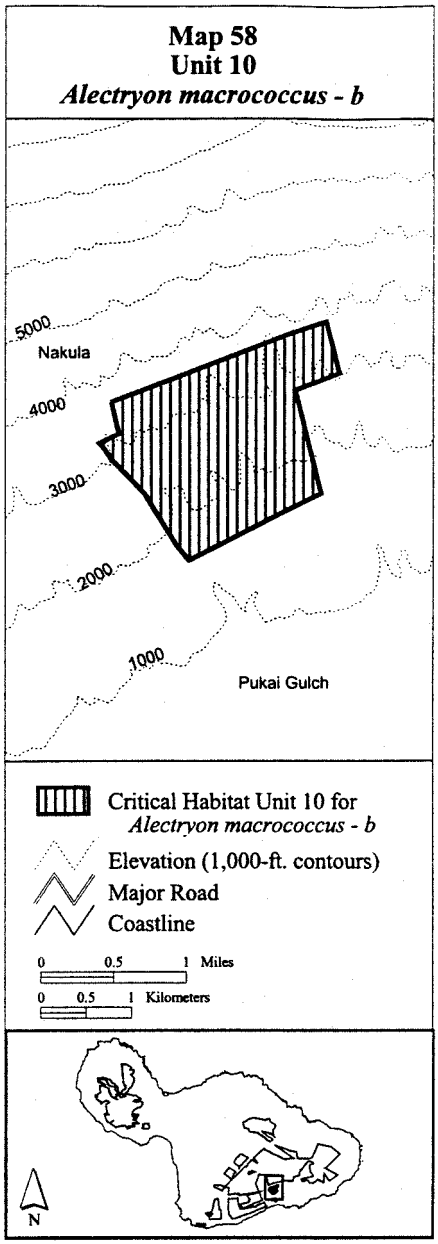
(B) **Note:** Map 57 follows:


Map 57 Unit 9 - *Schiedea haleakalensis - b*
Ukulele Camp
Kalialinui
Hosmer Grove
Haleakala Crater Rd.
Halekala Highway
Kula Highway
Puu Maho
Waiakoa
Waiohuli
Waikau Cabin
Kuhiwa Valley
Wailuaiki Stream
Hana Highway
Puu Puou
Waihoi Valley
Haleakala Crater
Nuu
Nakula
Kaokao Ridge
Puu Ouli
Kahalulu Gulch
Kepio
Lelekea Bay
Manawainui
Mamalu Bay
Hokukano
Wekea Point
3000
4000
5000
6000
7000
2000
1000
0 1 2 3 Miles
0 1 2 3 Kilometers
Critical Habitat Unit 9
Critical Habitat for *Schiedea haleakalensis - b*
Elevation (1,000-ft. contours)
Major Road
Coastline
N

(lviii) Maui 10—*Alectryon macrococcus*—b (402 ha; 992 ac).

(A) Unit consists of the following 25 boundary points: Start at 790161, 2287892; 790167, 2287894; 792132, 2288649; 792550, 2288788; 792695, 2288207; 792207, 2288023; 792491, 2286865; 792021, 2286624; 791018, 2286111; 790896, 2286265; 790745, 2286503; 790526, 2286863; 790525, 2286864; 790342, 2287060; 790170, 2287235; 790166, 2287238; 790160, 2287244; 790149, 2287257; 790135, 2287278; 790113, 2287317; 790099, 2287341; 790085, 2287359; 790061, 2287386; 790031, 2287426; 790244, 2287538; return to starting point.

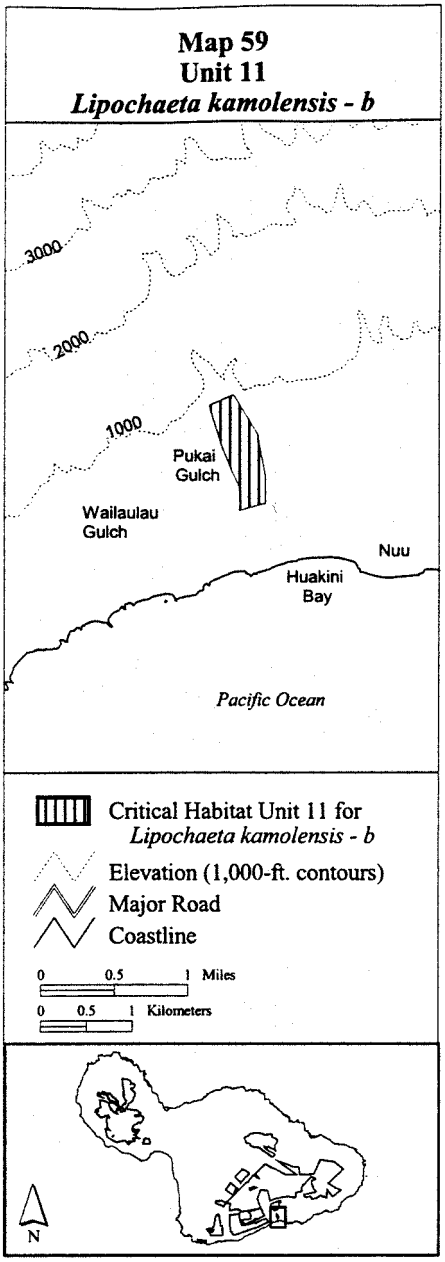
(B) **Note:** Map 58 follows:



(lix) Maui 11—*Lipochaeta kamolensis*—b (42 ha; 105 ac).

(A) Unit consists of the following 16 boundary points: Start at 791492, 2285251; 791757, 2285370; 791758, 2285368; 792019, 2284935; 792107, 2284459; 792107, 2284447; 792107, 2284163; 792103, 2284162; 791825, 2284087; 791831, 2284136; 791831, 2284137; 791825, 2284347; 791825, 2284348; 791736, 2284527; 791629, 2284802; 791506, 2285203; return to starting point.

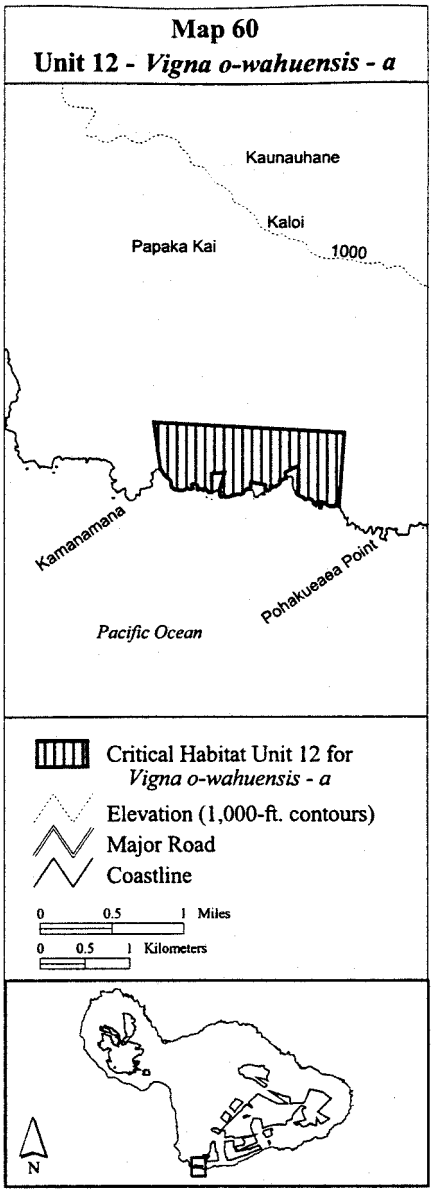
(B) **Note:** Map 59 follows:



(lx) Maui 12—*Vigna o-wahuensis*—a (144 ha; 357 ac).

(A) Unit consists of the following 27 boundary points and the intermediate coastline: Start at Start at 771207, 2278581; 771207, 2278581; 772344, 2278517; 773349, 2278461; 773349, 2278461; 773349, 2278461; 773296, 2277638; 773294, 2277610; 772830, 2277758; 772830, 2277758; 772839, 2278087; 772691, 2278009; 772697, 2277944; 772464, 2277817; 772464, 2277818; 772464, 2277873; 772302, 2277904; 772291, 2277823; 772291, 2277823; 771941, 2277804; 772001, 2278009; 771861, 2277996; 771858, 2277785; 771283, 2278049; 771283, 2278049; 771283, 2278049; 771207, 2278581; return to starting point.; return to starting point.

(B) **Note:** Map 60 follows:

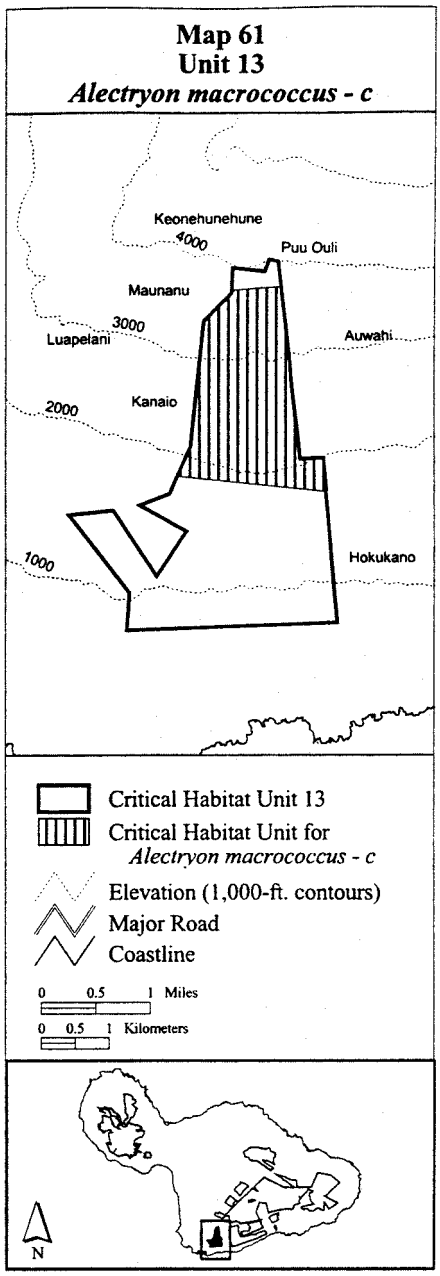


(lxi) Maui 13—*Alectryon macrococcus*—c (418 ha; 1,034 ac).

(A) Unit consists of the following 20 boundary points: Start at 777409, 2281715; 777399, 2281716; 775210, 2281944; 775397, 2282390; 775399, 2282405; 775595, 2284266; 776003, 2284682; 776042, 2284722; 776732,

2284778; 776737, 2284731; 776802, 2284151; 776861, 2283642; 776886, 2283406; 776919, 2283097; 776983, 2282542; 777020, 2282206; 777020, 2282205; 777021, 2282204; 777365, 2282220; 777408, 2281728; return to starting point.

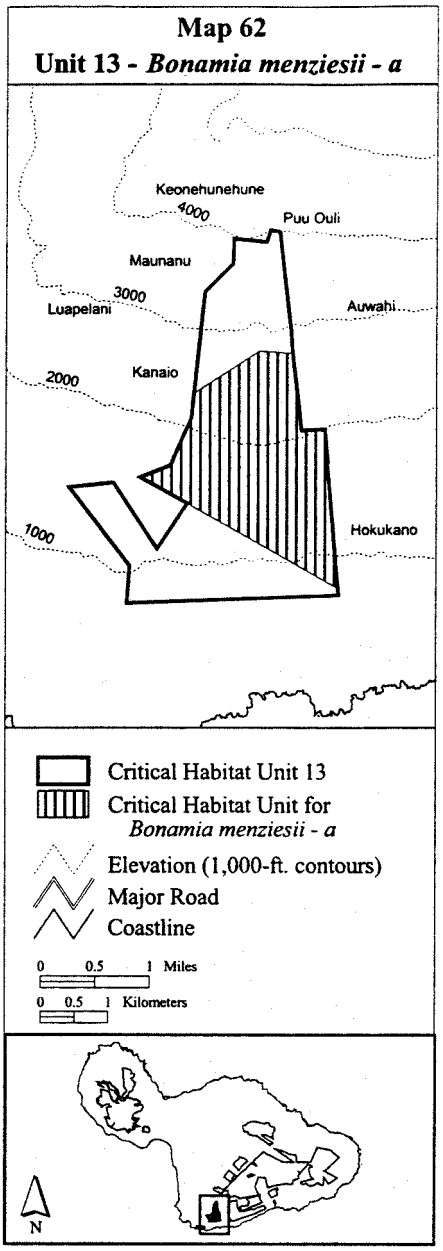
(B) **Note:** Map 61 follows:



(lxii) Maui 13—*Bonamia menziesii*—a (536 ha; 1,325 ac).

(A) Unit consists of the following 18 boundary points: Start at 777534, 2280121; 777558, 2279855; 777557, 2279856; 775339, 2281114; 774656, 2281501; 775099, 2281680; 775397, 2282390; 775399, 2282405; 775433, 2282731; 775436, 2282755; 776398, 2283391; 776891, 2283357; 776919, 2283097; 776983, 2282542; 777020, 2282206; 777020, 2282205; 777021, 2282204; 777348, 2282219; return to starting point.

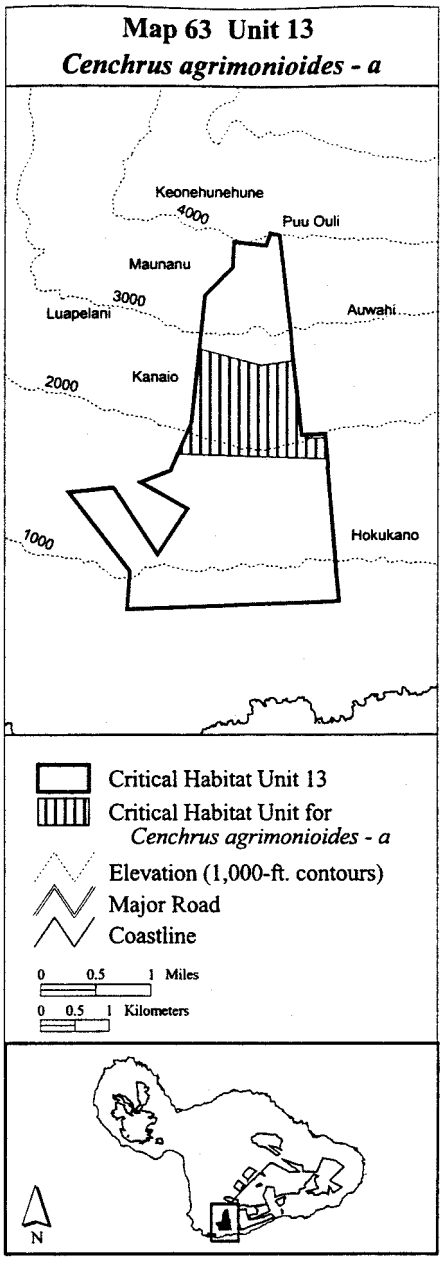
(B) **Note:** Map 62 follows:



(lxiii) Maui 13—*Cenchrus agrimonioides*—a (237 ha; 586 ac).

(A) Unit consists of the following 15 boundary points: Start at 775397, 2282390; 775399, 2282405; 775513, 2283488; 776422, 2283239; 776896, 2283308; 776919, 2283097; 776983, 2282542; 777020, 2282206; 777020, 2282205; 777021, 2282204; 777071, 2282206; 777077, 2282162; 777341, 2282162; 777390, 2281851; 775204, 2281929; return to starting point.

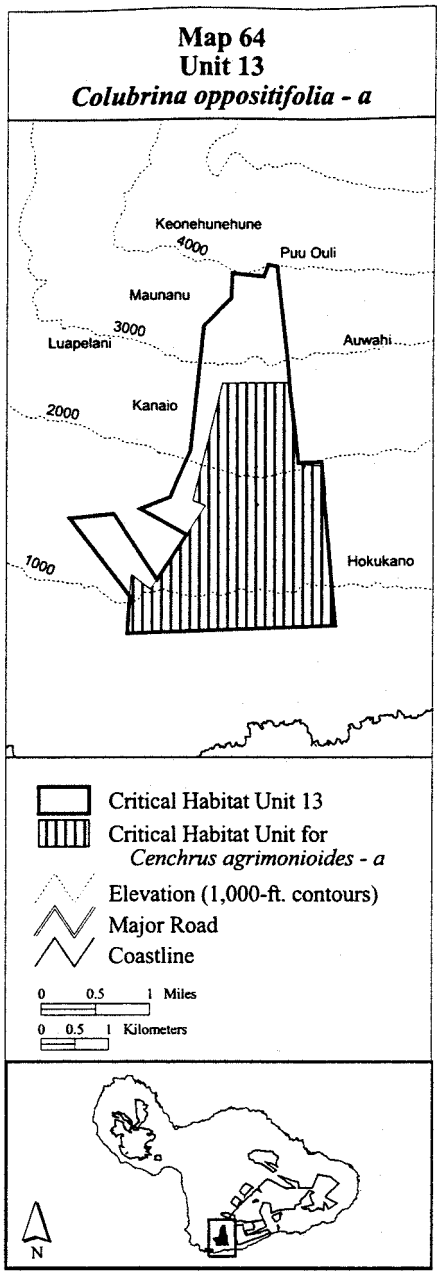
(B) **Note:** Map 63 follows:



(lxiv) Maui 13—*Colubrina oppositifolia*—a (739 ha; 1,827 ac).

(A) Unit consists of the following 20 boundary points: Start at 777399, 2281716; 777534, 2280121; 777557, 2279856; 777566, 2279748; 774460, 2279633; 774498, 2280191; 774520, 2280511; 774805, 2280290; 774901, 2280438; 775339, 2281114; 775626, 2281557; 775438, 2281627; 775884, 2283410; 776885, 2283418; 776886, 2283406; 776919, 2283097; 776983, 2282542; 776985, 2282522; 777010, 2282190; 777361, 2282167; return to starting point.

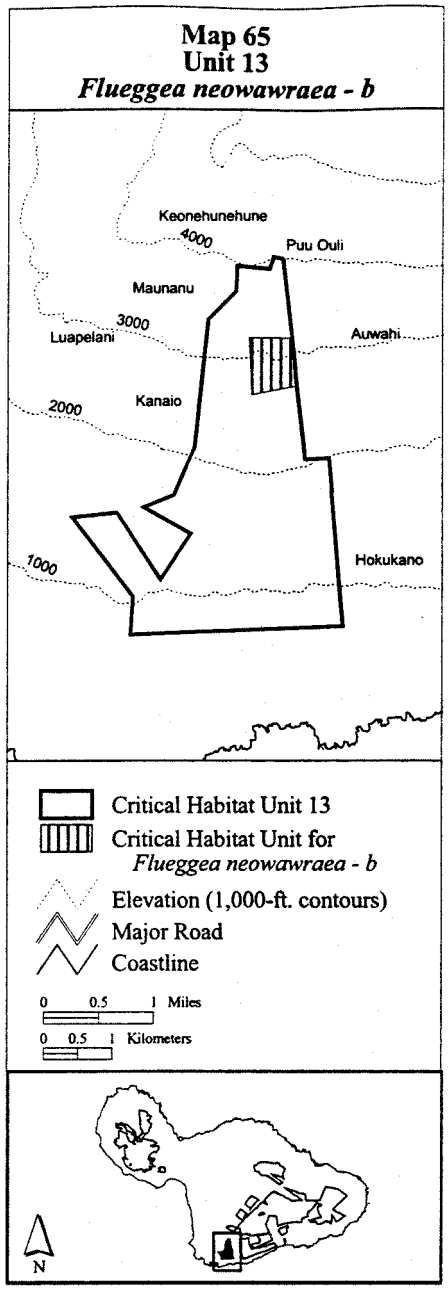
(B) **Note:** Map 64 follows:



(lxv) Maui 13—*Flueggea neowawraea*—b (50 ha; 123 ac).

(A) Unit consists of the following 6 boundary points: Start at 776821, 2283991; 776861, 2283642; 776886, 2283406; 776899, 2283288; 776236, 2283166; 776192, 2283998; return to starting point.

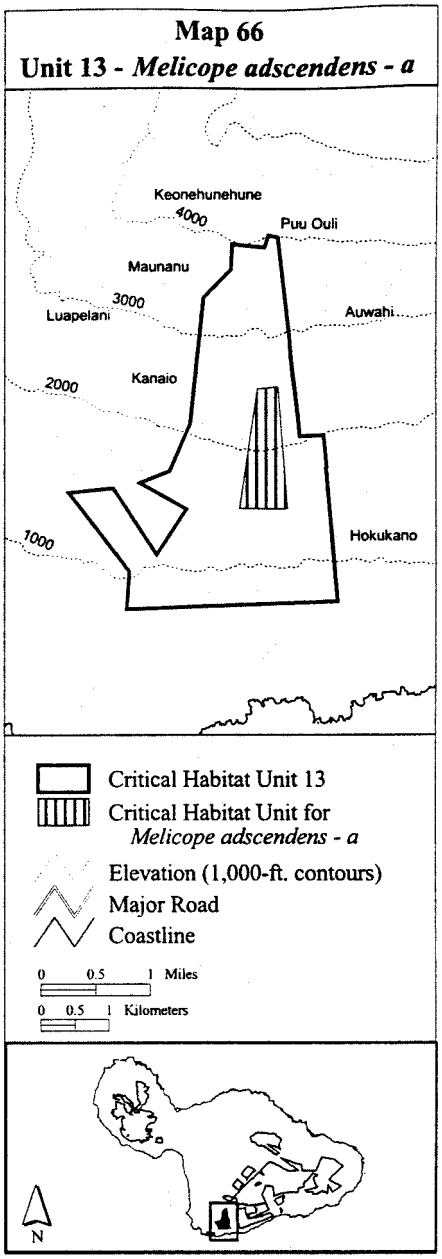
(B) **Note:** Map 65 follows:



(lxvi) Maui 13—*Melicope adscendens*—a (161 ha; 397 ac).

(A) Unit consists of the following 12 boundary points: Start at 776003, 2284682; 776019, 2285054; 776489, 2284998; 776709, 2284972; 776737, 2284731; 776802, 2284151; 776844, 2283785; 776865, 2283600; 776886, 2283406; 776919, 2283097; 776928, 2283019; 775938, 2283164; return to starting point.

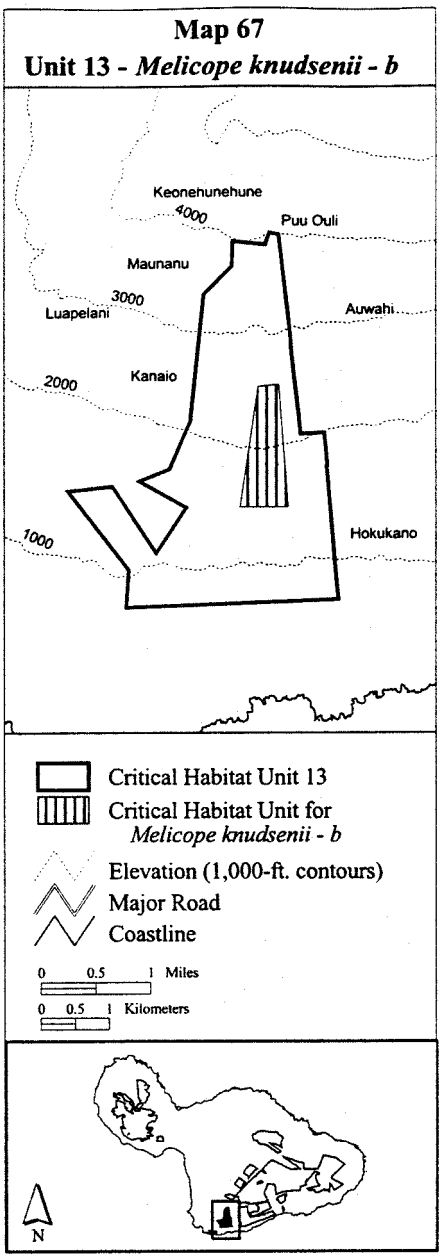
(B) **Note:** Map 66 follows:



(lxvii) Maui 13—*Melicope knudsenii*—b (163 ha; 403 ac).

(A) Unit consists of the following 11 boundary points: Start at 776489, 2284998; 776552, 2285180; 776688, 2285156; 776737, 2284731; 776802, 2284151; 776854, 2283698; 776863, 2283625; 776886, 2283406; 776919, 2283097; 776948, 2282847; 775700, 2282749; return to starting point.

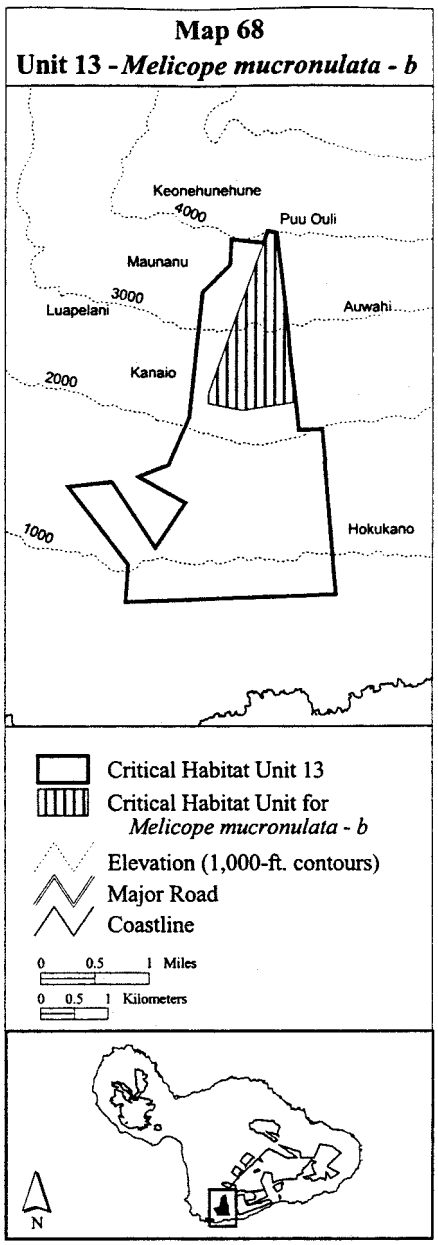
(B) **Note:** Map 67 follows:



(lxviii) Maui 13—*Melicope mucronulata*—b (195 ha; 481 ac).

(A) Unit consists of the following 13 boundary points: Start at 776560, 2285179; 776688, 2285156; 776737, 2284731; 776802, 2284151; 776834, 2283873; 776873, 2283524; 776886, 2283406; 776919, 2283097; 776973, 2282631; 776189, 2282501; 775681, 2282604; 775689, 2282754; 776094, 2283897; return to starting point.

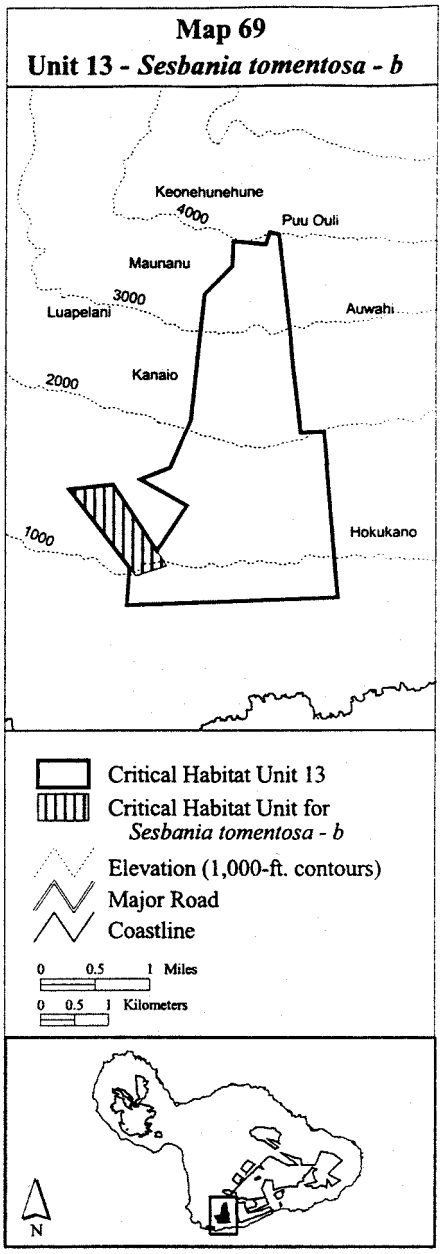
(B) **Note:** Map 68 follows:



(lxix) Maui 13—*Sesbania tomentosa*—b (79 ha; 195 ac).

(A) Unit consists of the following 6 boundary points: Start at 774498, 2280191; 773607, 2281357; 774253, 2281429; 774901, 2280438; 775045, 2280217; 774598, 2280060; return to starting point.

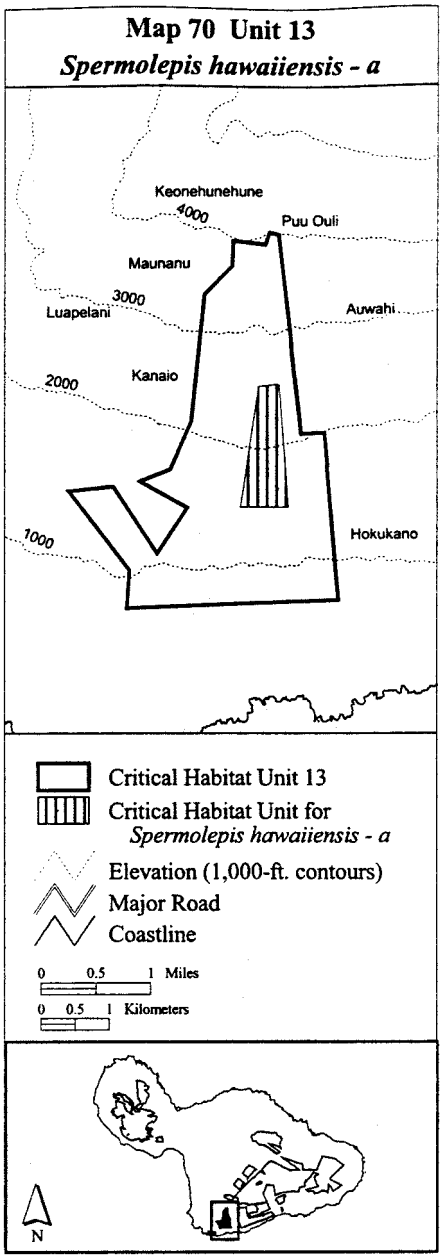
(B) **Note:** Map 69 follows:



(lxx) Maui 13—*Spermolepis hawaiiensis*—a (91 ha; 225 ac).

(A) Unit consists of the following 4 boundary points: Start at 776697, 2282941; 776828, 2281119; 776127, 2281124; 776388, 2282905; return to starting point.

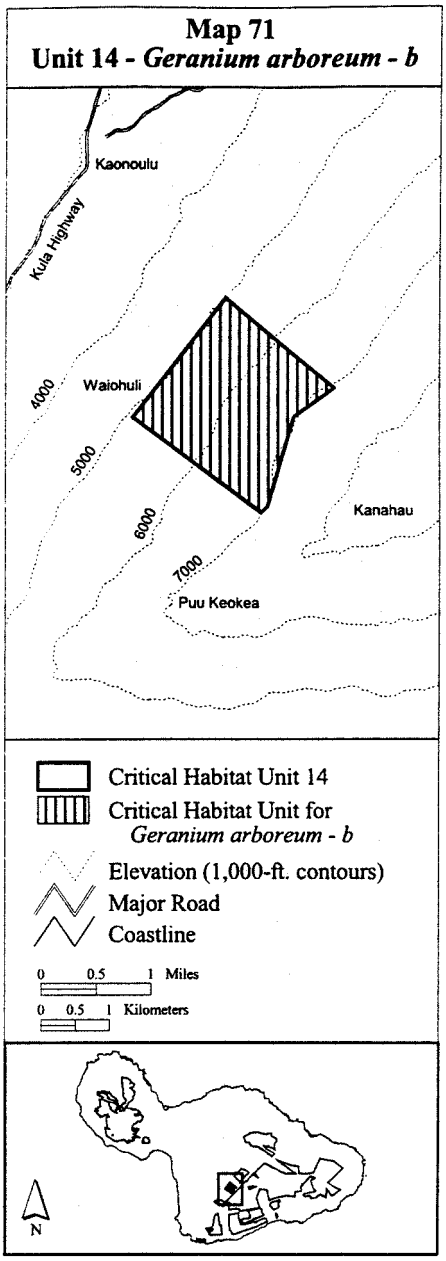
(B) **Note:** Map 70 follows:



(lxxi) Maui 14—*Geranium arboreum*—b (452 ha; 1,116 ac).

(A) Unit consists of the following 9 boundary points: Start at 780754, 2291599; 780710, 2291446; 780373, 2290270; 780279, 2290173; 780278, 2290174; 778398, 2291590; 779750, 2293350; 781334, 2292030; 781340, 2292025; return to starting point.

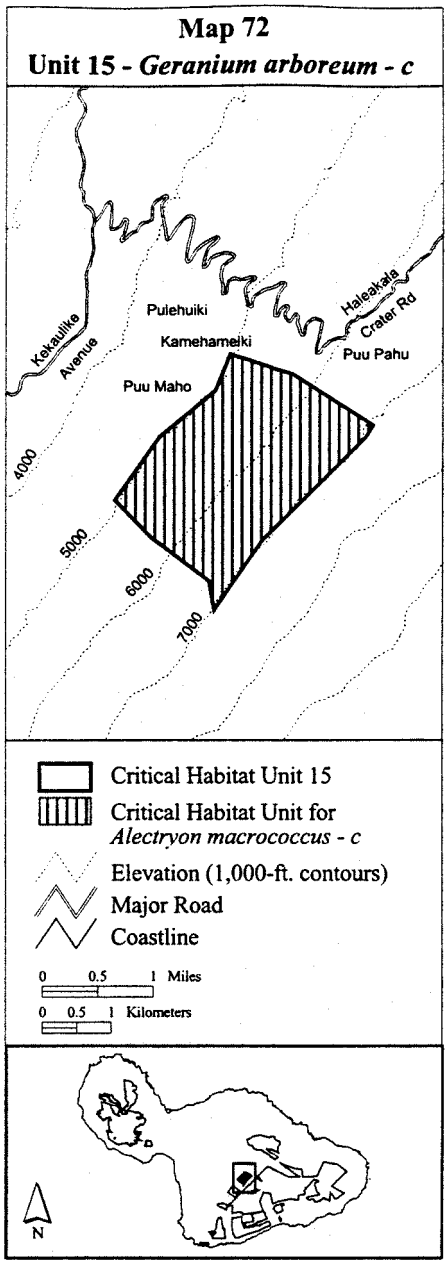
(B) **Note:** Map 71 follows:



(lxxii) Maui 15—*Geranium arboreum*—c (667 ha; 1,648 ac).

(A) Unit consists of the following 39 boundary points: Start at 783428, 2296641; 784570, 2295895; 784440, 2295690; 784206, 2295457; 782957, 2294208; 782956, 2294207; 782421, 2293422; 782263, 2293191; 782223, 2293416; 782187, 2293615; 781338, 2294254; 781096, 2294510; 780818, 2294804; 781473, 2295735; 782282, 2296409; 782490, 2296948; 782522, 2296937; 782582, 2296918; 782616, 2296907; 782636, 2296900; 782656, 2296893; 782679, 2296886; 782713, 2296875; 782816, 2296841; 782839, 2296833; 782858, 2296827; 782895, 2296816; 782965, 2296793; 783029, 2296772; 783050, 2296765; 783073, 2296758; 783093, 2296751; 783114, 2296744; 783182, 2296721; 783227, 2296707; 783263, 2296695; 783282, 2296689; 783304, 2296681; 783388, 2296654; return to starting point.

(B) **Note:** Map 72 follows:

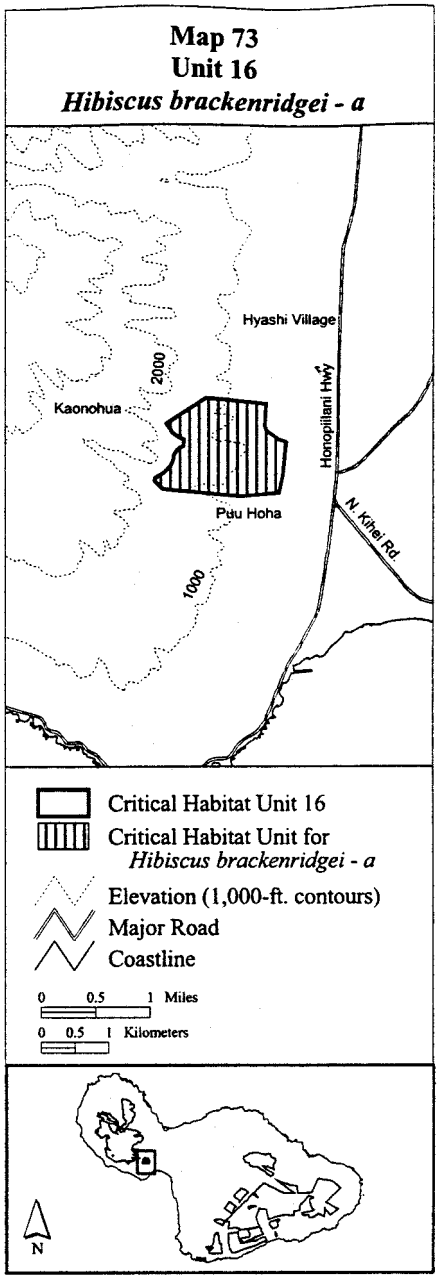


(lxxiii) Maui 16—*Hibiscus brackenridgei*—a (212 ha; 523 ac).

(A) Unit consists of the following 27 boundary points: Start at 756769, 2303771; 756794, 2303787; 756914, 2303864; 757007, 2303958; 757033, 2304013; 757058, 2304068; 757053, 2304123; 757071, 2304153; 757104, 2304208; 757162, 2304244; 757198, 2304267; 757206, 2304365; 757138, 2304395; 757037, 2304471; 756959, 2304605; 757541, 2304994; 758421, 2304900; 758402, 2304566; 758427, 2304491; 758605, 2304369; 758716, 2304323; 758665, 2303806; 758665,

2303805; 758615, 2303558; 758067, 2303509; 756894, 2303623; 756774, 2303746; return to starting point.

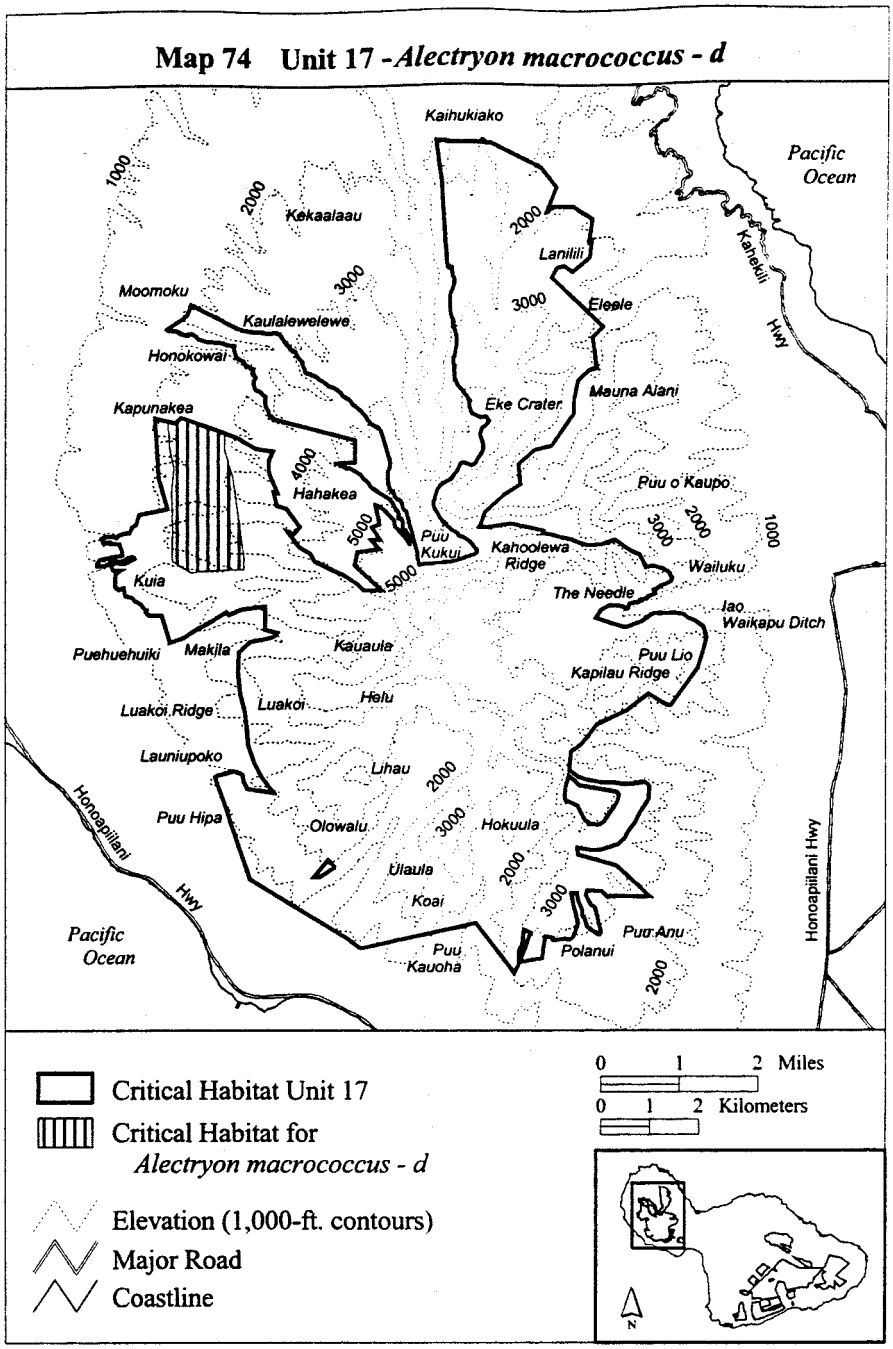
(B) **Note:** Map 73 follows:



(lxxiv) Maui 17—*Alectryon macrococcus*—d (391 ha; 965 ac).

(A) Unit consists of the following 27 boundary points: Start at 746095, 2314835; 746096, 2314835; 746207, 2314953; 746887, 2314706; 747096, 2314630; 747103, 2314277; 747172, 2314023; 747194, 2313958; 747189, 2313958; 747258, 2313703; 747500, 2311983; 747492, 2311912; 747502, 2311779; 746629, 2311755; 746420, 2311719; 746022, 2311962; 746024, 2312026; 746020, 2312039; 746014, 2312318; 746038, 2312650; 746002, 2313394; 746052, 2313940; 746048, 2313940; 745960, 2314381; 745954, 2314592; 745934, 2314718; 745938, 2314873; return to starting point.

(B) **Note:** Map 74 follows:

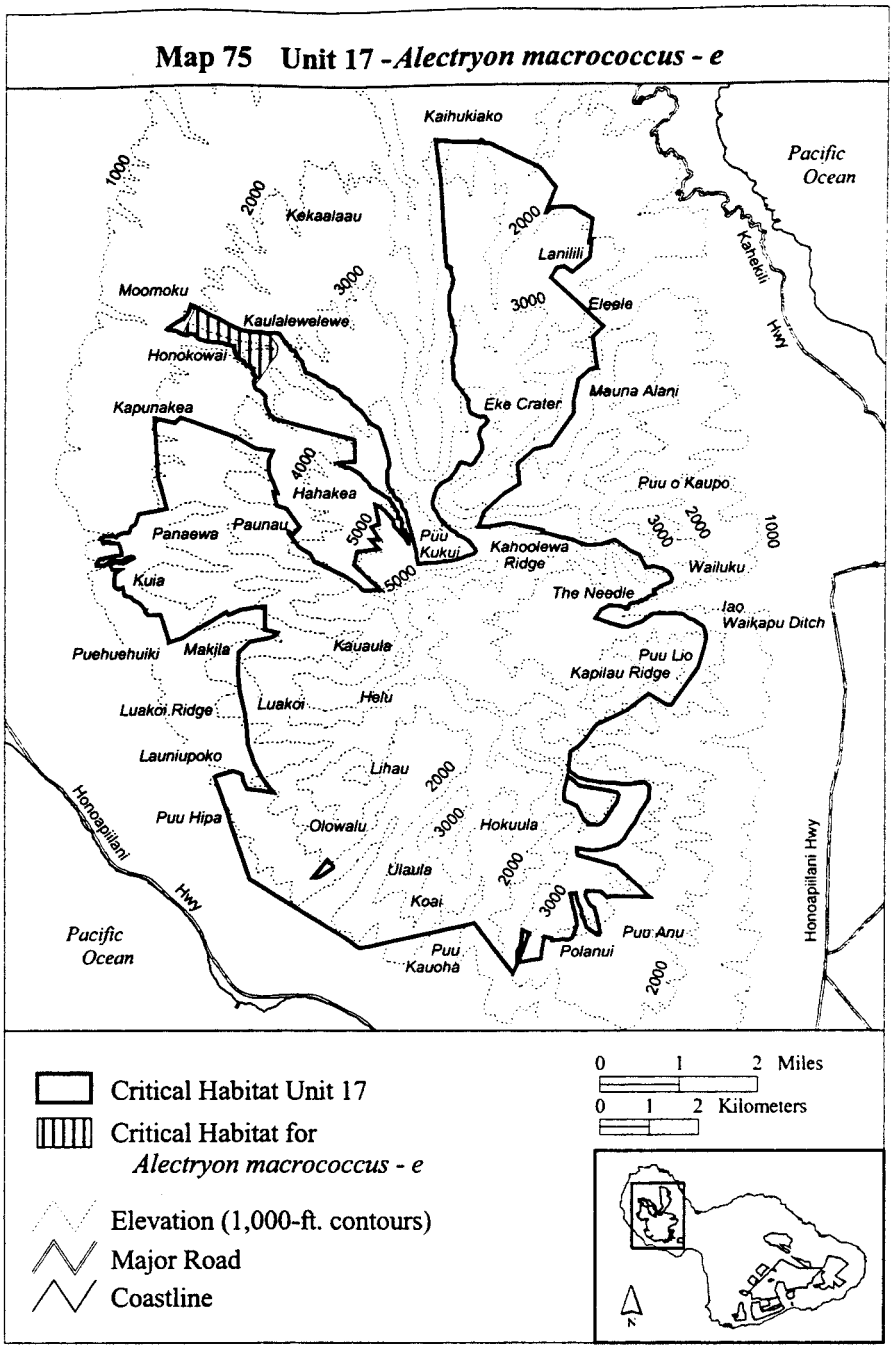


(lxxv) Maui 17—*Alectryon macrococcus*—e (110 ha; 271 ac).

(A) Unit consists of the following 105 boundary points: Start at 747695, 2315652; 747693, 2315665; 747695, 2315687; 747702, 2315718; 747713, 2315745; 747728, 2315775; 747729, 2315792; 747729, 2315793; 747717, 2315811; 747717, 2315812; 747697, 2315822; 747681, 2315836; 747675, 2315860; 747677, 2315876; 747681, 2315899; 747681, 2315918; 747667, 2315950; 747648, 2315974; 747620, 2315996; 747585, 2316012; 747546, 2316034; 747526, 2316055; 747508, 2316086; 747494, 2316109; 747476, 2316129; 747447, 2316142; 747409, 2316159; 747389, 2316169; 747365, 2316186; 747345, 2316212; 747336, 2316228; 747328, 2316244; 747312, 2316282; 747299, 2316323; 747290, 2316361; 747289, 2316384; 747289, 2316392; 747296, 2316429; 747296, 2316430; 747296, 2316431; 747260, 2316441; 747214, 2316449; 747159, 2316459; 747125, 2316462; 747109, 2316472; 747100, 2316476; 747078, 2316500; 747077, 2316501; 747055, 2316503; 747024, 2316497; 746977, 2316510; 746946, 2316512; 746922, 2316518; 746881, 2316516; 746836, 2316520; 746786, 2316524; 746741, 2316526; 746698, 2316533; 746655, 2316550; 746617, 2316562; 746584, 2316571; 746551, 2316595; 746533, 2316622; 746505, 2316643; 746458, 2316680; 746457, 2316680; 746411, 2316689; 746410, 2316689; 746348, 2316682; 746338, 2316683; 746337, 2316682; 746335, 2316658; 746329, 2316659; 746231, 2316679; 746501, 2317239; 746647, 2317164; 746706, 2317135; 746859, 2317060; 746968, 2317006; 747190, 2316887; 747229, 2316866; 747344, 2316808; 747418, 2316781; 747517, 2316751; 747602, 2316733; 747628, 2316729; 747715, 2316716; 747716, 2316715; 747717,

2316715; 747937, 2316652; 748040, 2316630; 748046, 2316620; 748049, 2316619; 748181, 2316434; 748179, 2316409; 748181, 2316406; 748176, 2316380; 748164, 2316249; 748053, 2316110; 747990, 2316024; 747963, 2315953; 747889, 2315855; 747846, 2315782; 747792, 2315728; 747733, 2315650; return to starting point.

(B) **Note:** Map 75 follows:

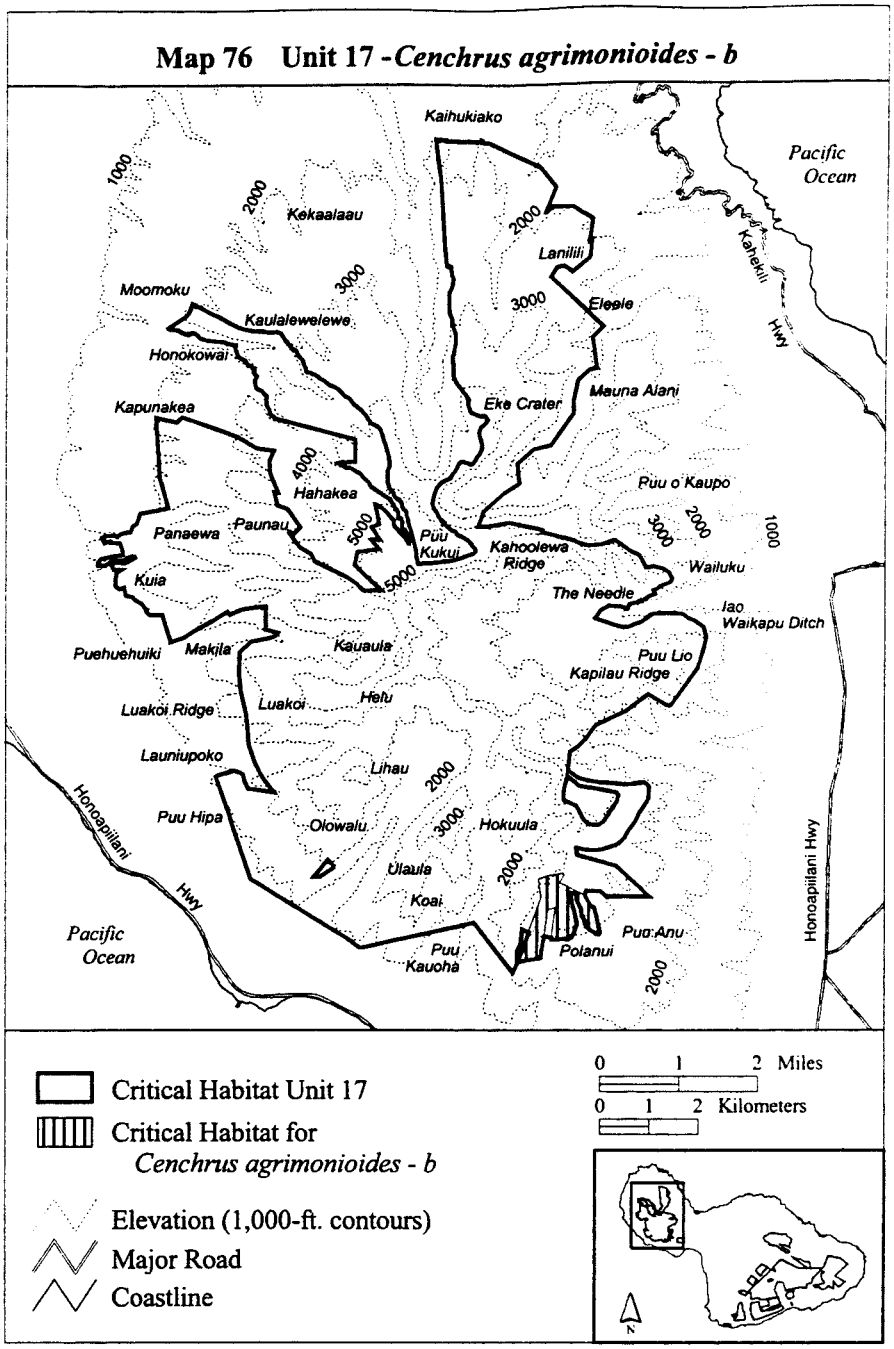


(lxxvi) Maui 17—*Cenchrus agrimonioides*—b (119 ha; 293 ac).

(A) Unit consists of the following 55 boundary points: Start at 753366, 2304292; 753617, 2305024; 753566, 2305394; 753780, 2305464; 754068, 2305512; 754084, 2305461; 754013, 2305321; 754480, 2305078; 754546, 2305000; 754621, 2304863; 754699, 2304812; 754764, 2304356; 754769, 2304263; 754770, 2304254; 754759, 2304261; 754670, 2304324; 754542, 2304415; 754352, 2305097; 754319, 2305108; 754132, 2305170; 754163, 2305075; 754239, 2304985; 754242, 2304971; 754278, 2304785; 754347, 2304463; 754340, 2304443; 754333, 2304422; 754326, 2304400; 754314, 2304365; 754314, 2304364; 754278, 2304259; 754277, 2304259; 754068, 2304164; 754067, 2304164; 754066, 2304164; 754065, 2304164; 753918, 2304149; 753825, 2304139; 753832, 2304195; 753908, 2304800; 753751, 2304765; 753675, 2304217; 753632, 2303912; 753617, 2303805; 753611, 2303762; 753577, 2303756; 753550, 2303751; 753534, 2303749; 753531, 2303748; 753152, 2303682; 753163, 2303713; 753304, 2304113; 753310,

2304130; 753365, 2304285; 753367, 2304292; return to starting point.

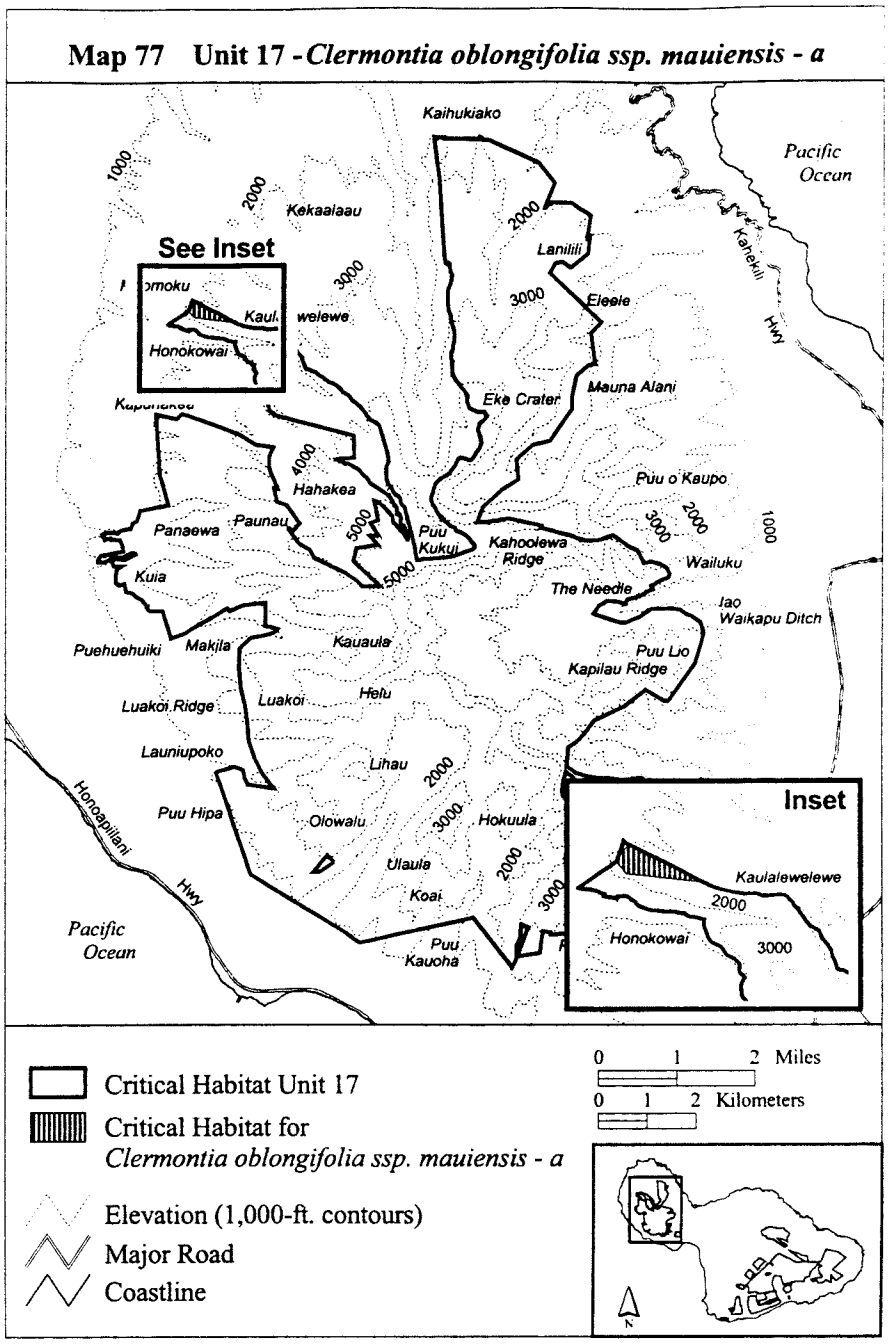
(B) **Note:** Map 76 follows:



(lxxvii) Maui 17—*Clermontia oblongifolia* ssp. *mauiensis*—a (16 ha; 40 ac).

(A) Unit consists of the following 12 boundary points: Start at 746327, 2317071; 746357, 2317155; 746471, 2317255; 746647, 2317164; 746706, 2317135; 746859, 2317060; 746968, 2317006; 747190, 2316887; 747229, 2316866; 747288, 2316836; 746433, 2316935; 746323, 2317068; return to starting point.

(B) **Note:** Map 77 follows:

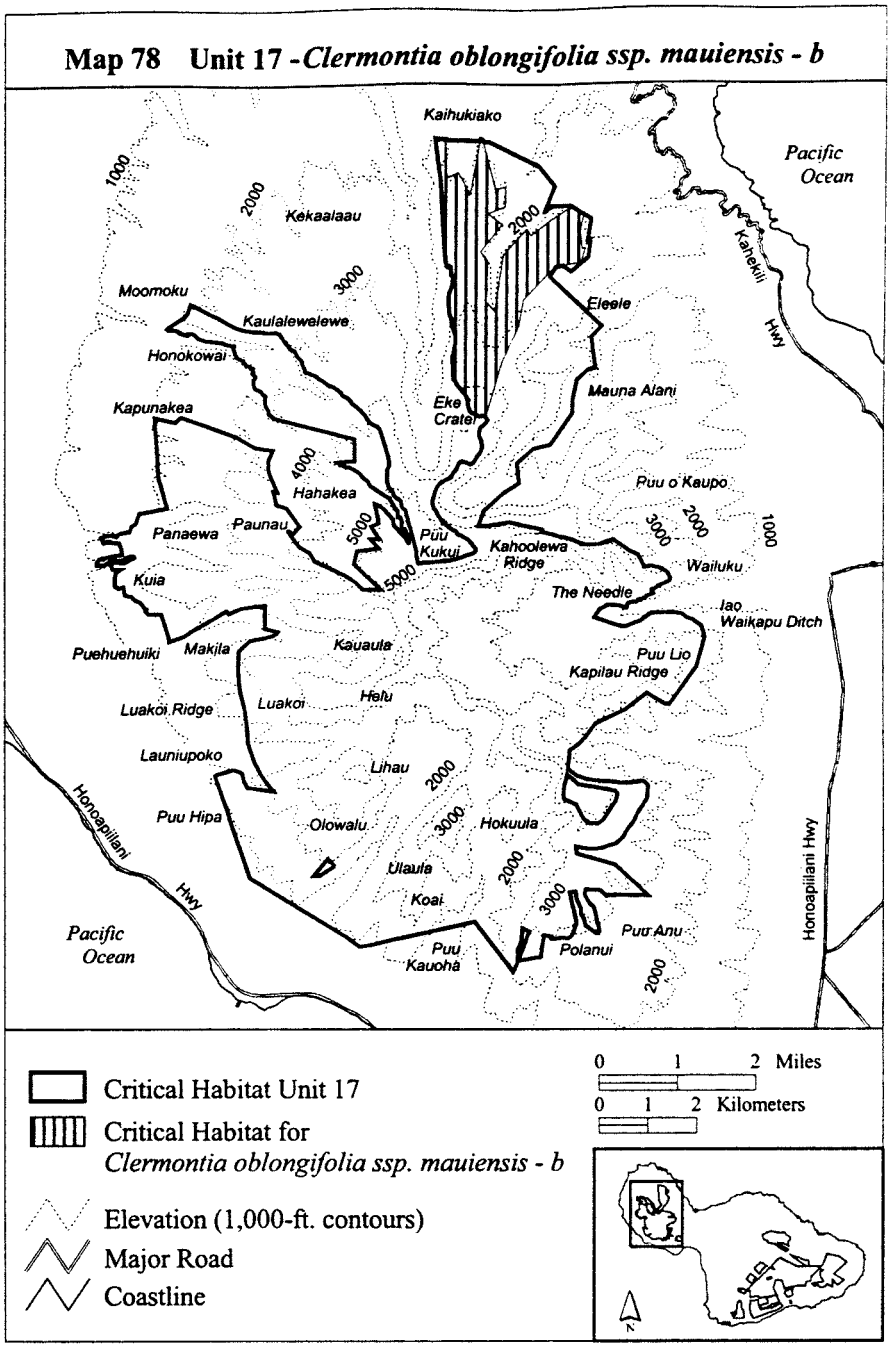


(lxxviii) Maui 17—*Clermontia oblongifolia* ssp. *mauiensis*—b (696 ha; 1,720 ac).

(A) Unit consists of the following 130 boundary points: Start at 752453, 2314975; 752453, 2314976; 752416, 2314975; 752381, 2314973; 752342, 2314967; 752250, 2315013; 752158, 2315058; 752138, 2315091; 752117, 2315151; 752108, 2315196; 752103, 2315252; 752113, 2315300; 752112, 2315302; 752096, 2315325; 752085, 2315344; 752070, 2315374; 752051, 2315406; 752026, 2315438; 751991, 2315478; 751949, 2315532; 751900, 2315589; 751856, 2315640; 751831, 2315694; 751805, 2315739; 751802, 2315745; 751780, 2316007; 751791, 2316023; 751792, 2316024; 751792, 2316025; 751785, 2316046; 751774, 2316078; 751771, 2316121; 751767, 2316164; 751778, 2316192; 751794, 2316230; 751799, 2316258; 751807, 2316311; 751812, 2316339; 751828, 2316408; 751840, 2316469; 751842, 2316535; 751836, 2316587; 751832, 2316640; 751828, 2316678; 751828, 2316679; 751812, 2316711; 751793, 2316765; 751774, 2316831; 751763, 2316879; 751754, 2316929; 751744, 2317001; 751727, 2317051; 751703, 2317090; 751693, 2317225; 751691, 2317254; 751693, 2317261; 751698, 2317290; 751694, 2317322; 751695, 2317366; 751697, 2317415; 751702, 2317462; 751715, 2317522; 751728, 2317571; 751747, 2317619; 751767, 2317682; 751769, 2317710; 751778, 2317751; 751782, 2317790; 751782, 2317791; 751769, 2317829; 751750, 2317859; 751741, 2317901; 751738, 2317949; 751738, 2317997; 751730, 2318034; 751729, 2318035; 751714, 2318045; 751713, 2318046; 751712, 2318046; 751690, 2318034; 751665,

2318030; 751651, 2318051; 751640, 2318085; 751632, 2318124; 751599, 2318608; 751517, 2319810; 751458, 2320229; 751458, 2320252; 751458, 2320253; 751454, 2320260; 751411, 2320566; 751402, 2320630; 751401, 2320638; 751430, 2320630; 751621, 2320578; 751649, 2319822; 751885, 2319941; 752122, 2319497; 752334, 2320586; 752346, 2320647; 752379, 2320632; 752380, 2320629; 752654, 2319615; 752861, 2319645; 752861, 2319260; 752506, 2319113; 752802, 2318906; 752358, 2318344; 752506, 2318166; 752477, 2317338; 752654, 2317131; 752832, 2318285; 753305, 2318817; 753393, 2318669; 753778, 2318965; 754192, 2319231; 754441, 2319131; 754485, 2319104; 754399, 2318787; 754458, 2318403; 754519, 2318419; 754431, 2318127; 754060, 2318058; 753902, 2318028; 753875, 2318023; 753250, 2317363; 753146, 2316807; 752799, 2316077; 752486, 2315000; 752460, 2314964; return to starting point.

(B) **Note:** Map 78 follows:

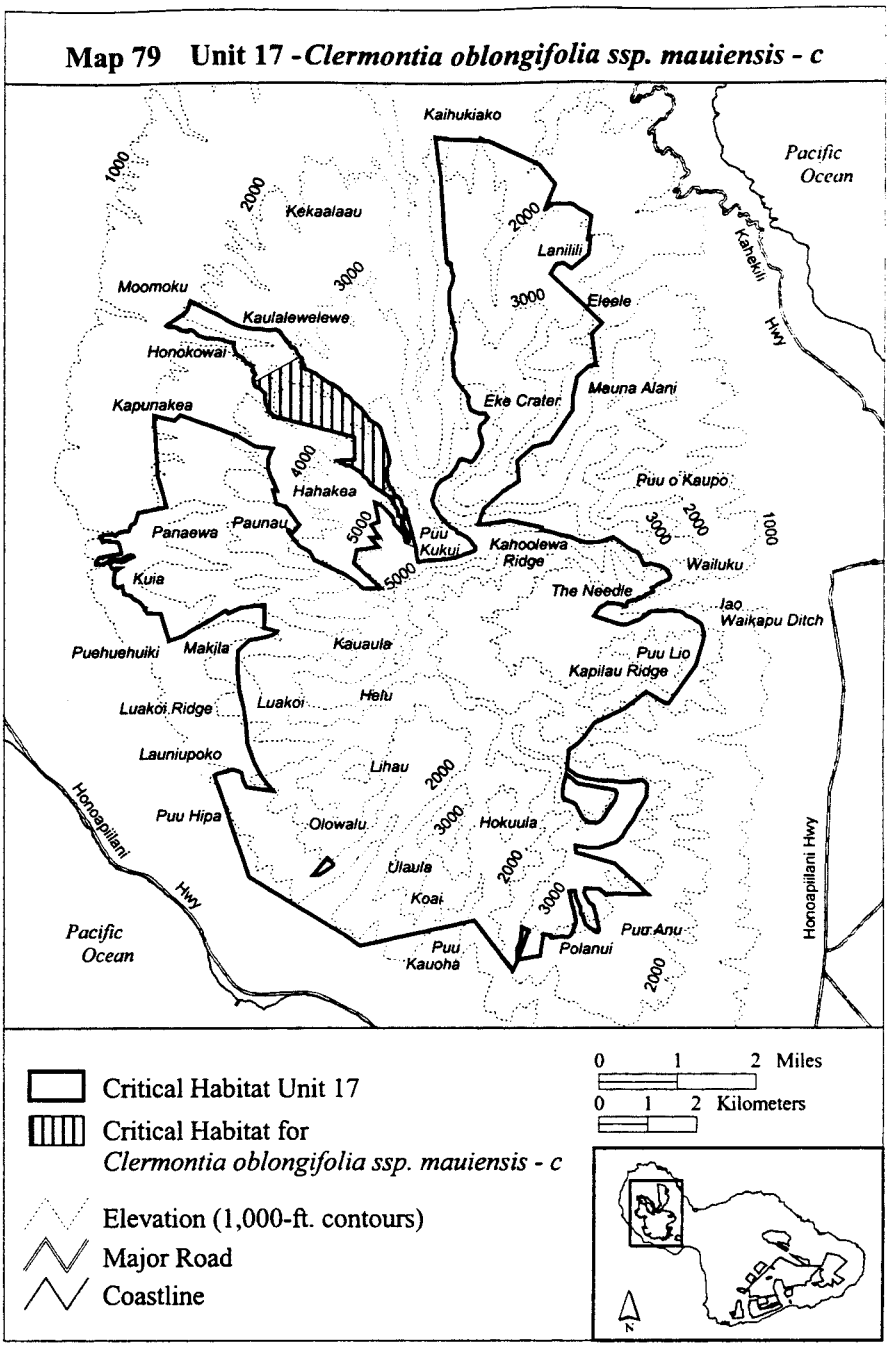


(lxxix) Maui 17—*Clermontia oblongifolia* ssp. *mauiensis*—c (296 ha; 732 ac).

(A) Unit consists of the following 262 boundary points: Start at 750654, 2312939; 750658, 2312963; 750658, 2312964; 750644, 2312989; 750610, 2313159; 750421, 2313289; 750102, 2313508; 750074, 2313542; 750046, 2313594; 750046, 2313595; 749977, 2313657; 749957, 2313674; 749879,

2313766; 749865, 2313785; 749864, 2313785; 749692, 2313889; 749655, 2313912; 749653, 2313912; 749594, 2313900; 749427, 2313998; 749481, 2314008; 749517, 2314015; 749719, 2314022; 749762, 2314024; 749763, 2314024; 749764, 2314024; 749764, 2314025; 749764, 2314060; 749776, 2314062; 749776, 2314445; 749768, 2314447; 749769, 2314498; 749768, 2314500; 749767, 2314500; 748184, 2314906; 748105, 2314940; 748092, 2314945; 748090, 2314947; 748089, 2314948; 748069, 2314973; 748068, 2314973; 748029, 2314987; 748007, 2315005; 748001, 2315029; 748005, 2315065; 748005, 2315083; 747994, 2315106; 747975, 2315127; 747954, 2315161; 747942, 2315193; 747940, 2315201; 747933, 2315253; 747929, 2315289; 747930, 2315329; 747935, 2315356; 747931, 2315379; 747914, 2315403; 747887, 2315423; 747857, 2315454; 747831, 2315482; 747792, 2315504; 747772, 2315512; 747727, 2315626; 748615, 2316119; 748666, 2316120; 748680, 2316102; 748682, 2316095; 748687, 2316079; 748691, 2316057; 748698, 2316026; 748698, 2316025; 748717, 2315987; 748727, 2315962; 748733, 2315944; 748738, 2315922; 748743, 2315901; 748750, 2315885; 748758, 2315876; 748759, 2315875; 748770, 2315868; 748796, 2315863; 748806, 2315862; 748826, 2315861; 748849, 2315847; 748876, 2315834; 748913, 2315824; 748949, 2315807; 748960, 2315800; 749000, 2315773; 749021, 2315756; 749067, 2315724; 749090, 2315709; 749140, 2315671; 749173, 2315647; 749188, 2315640; 749205, 2315627; 749223, 2315614; 749244, 2315605; 749332, 2315568; 749353, 2315555; 749385, 2315535; 749404, 2315524; 749421, 2315514; 749470, 2315477; 749479, 2315464; 749486, 2315451; 749500, 2315430; 749524, 2315402; 749550, 2315385; 749571, 2315373; 749617, 2315351; 749628, 2315342; 749652, 2315326; 749666, 2315306; 749677, 2315288; 749682, 2315280; 749701, 2315256; 749720, 2315236; 749736, 2315224; 749781, 2315186; 749804, 2315173; 749833, 2315147; 749874, 2315098; 749888, 2315088; 749934, 2315046; 749960, 2315009; 750020, 2314928; 750057, 2314876; 750072, 2314855; 750097, 2314830; 750120, 2314809; 750138, 2314798; 750173, 2314786; 750215, 2314763; 750223, 2314758; 750232, 2314754; 750246, 2314737; 750265, 2314720; 750286, 2314703; 750288, 2314702; 750454, 2314143; 750461, 2314125; 750462, 2314110; 750462, 2314098; 750469, 2314075; 750476, 2314039; 750478, 2314029; 750479, 2314015; 750481, 2313991; 750479, 2313958; 750479, 2313946; 750479, 2313933; 750476, 2313919; 750468, 2313903; 750450, 2313871; 750441, 2313851; 750441, 2313850; 750438, 2313827; 750440, 2313794; 750439, 2313772; 750436, 2313747; 750437, 2313723; 750437, 2313700; 750439, 2313671; 750438, 2313647; 750435, 2313610; 750436, 2313597; 750436, 2313596; 750441, 2313585; 750451, 2313562; 750456, 2313545; 750463, 2313528; 750465, 2313510; 750469, 2313497; 750469, 2313496; 750477, 2313484; 750491, 2313465; 750505, 2313443; 750510, 2313432; 750515, 2313420; 750526, 2313409; 750541, 2313398; 750551, 2313389; 750560, 2313367; 750565, 2313356; 750572, 2313334; 750578, 2313319; 750591, 2313304; 750609, 2313283; 750640, 2313257; 750643, 2313255; 750652, 2313247; 750674, 2313233; 750689, 2313219; 750704, 2313203; 750713, 2313180; 750725, 2313151; 750736, 2313118; 750747, 2313077; 750753, 2313062; 750767, 2313040; 750774, 2313031; 750792, 2313015; 750803, 2313003; 750815, 2312997; 750834, 2312921; 750866, 2312797; 750864, 2312784; 750864, 2312768; 750864, 2312767; 750868, 2312756; 750877, 2312736; 750881, 2312727; 750882, 2312717; 750888, 2312691; 750895, 2312668; 750904, 2312647; 750904, 2312646; 750905, 2312646; 751008, 2312240; 751019, 2312199; 751038, 2312126; 751038, 2312124; 751038, 2312092; 751037, 2312087; 751022, 2312131; 751013, 2312201; 750784, 2312291; 750742, 2312502; 750763, 2312476; 750804, 2312434; 750835, 2312384; 750877, 2312324; 750877, 2312323; 750878, 2312323; 750879, 2312323; 750880, 2312324; 750889, 2312378; 750889, 2312379; 750885, 2312387; 750887, 2312412; 750887, 2312413; 750876, 2312455; 750851, 2312517; 750819, 2312576; 750799, 2312595; 750799, 2312596; 750798, 2312596; 750757, 2312591; 750749, 2312590; 750747, 2312611; 750734, 2312726; 750739, 2312751; 750739, 2312752; 750730, 2312793; 750712, 2312846; 750711, 2312846; 750711, 2312847; 750691, 2312851; 750690, 2312851; 750687, 2312849; 750672, 2312852; return to starting point.

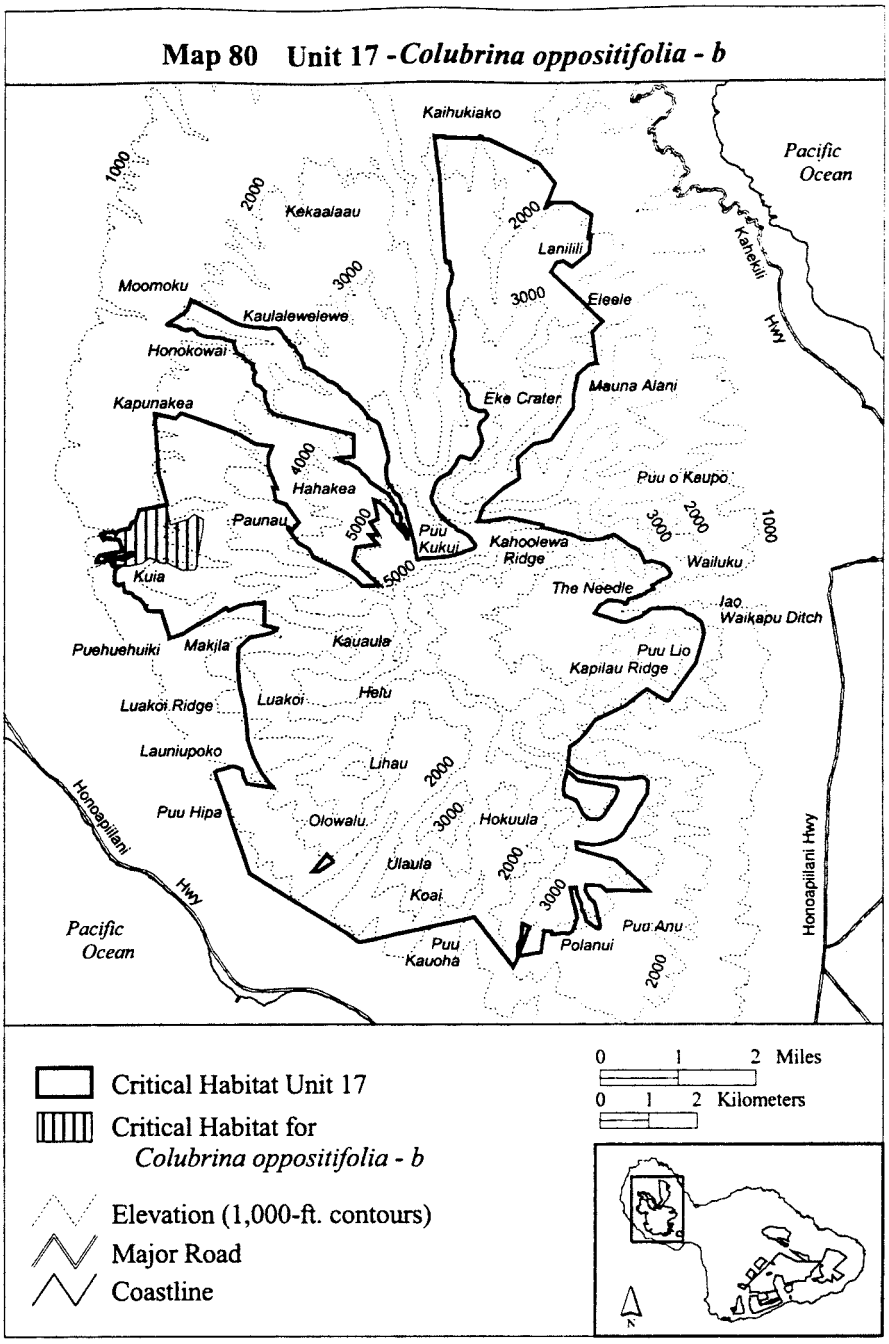
(B) **Note:** Map 79 follows:



(lxxx) Maui 17—*Colubrina oppositifolia*–b (176 ha; 436 ac).

(A) Unit consists of the following 67 boundary points: Start at 744959, 2311780; 744794, 2311780; 744757, 2311853; 744803, 2311913; 744873, 2311930; 745003, 2311908; 745103, 2311941; 745246, 2312013; 745237, 2312047; 745184, 2312054; 745082, 2312024; 744998, 2311962; 744940, 2311972; 744855, 2311959; 744843, 2311979; 744786, 2311969; 744644, 2311877; 744574, 2311856; 744542, 2311859; 744531, 2311866; 744526, 2311860; 744468, 2311866; 744468, 2311918; 744513, 2311972; 744523, 2311989; 744820, 2312059; 744992, 2312075; 744984, 2312177; 744929, 2312317; 744741, 2312341; 744737, 2312339; 744736, 2312339; 744734, 2312365; 744653, 2312345; 744609, 2312328; 744558, 2312437; 744633, 2312480; 744679, 2312478; 744722, 2312477; 744785, 2312485; 744871, 2312454; 744945, 2312517; 745143, 2312557; 745196, 2312680; 745264, 2312714; 745351, 2312931; 745805, 2313017; 745826, 2313019; 745913, 2313025; 745975, 2312628; 746367, 2312736; 746475, 2312844; 746618, 2312761; 746666, 2312733; 746657, 2312639; 746654, 2312523; 746558, 2311971; 746539, 2311801; 746492, 2311692; 746250, 2311692; 746219, 2311706; 746197, 2311706; 745959, 2311825; 745773, 2311844; 745572, 2311939; 745404, 2311822; 745147, 2311780; return to starting point.

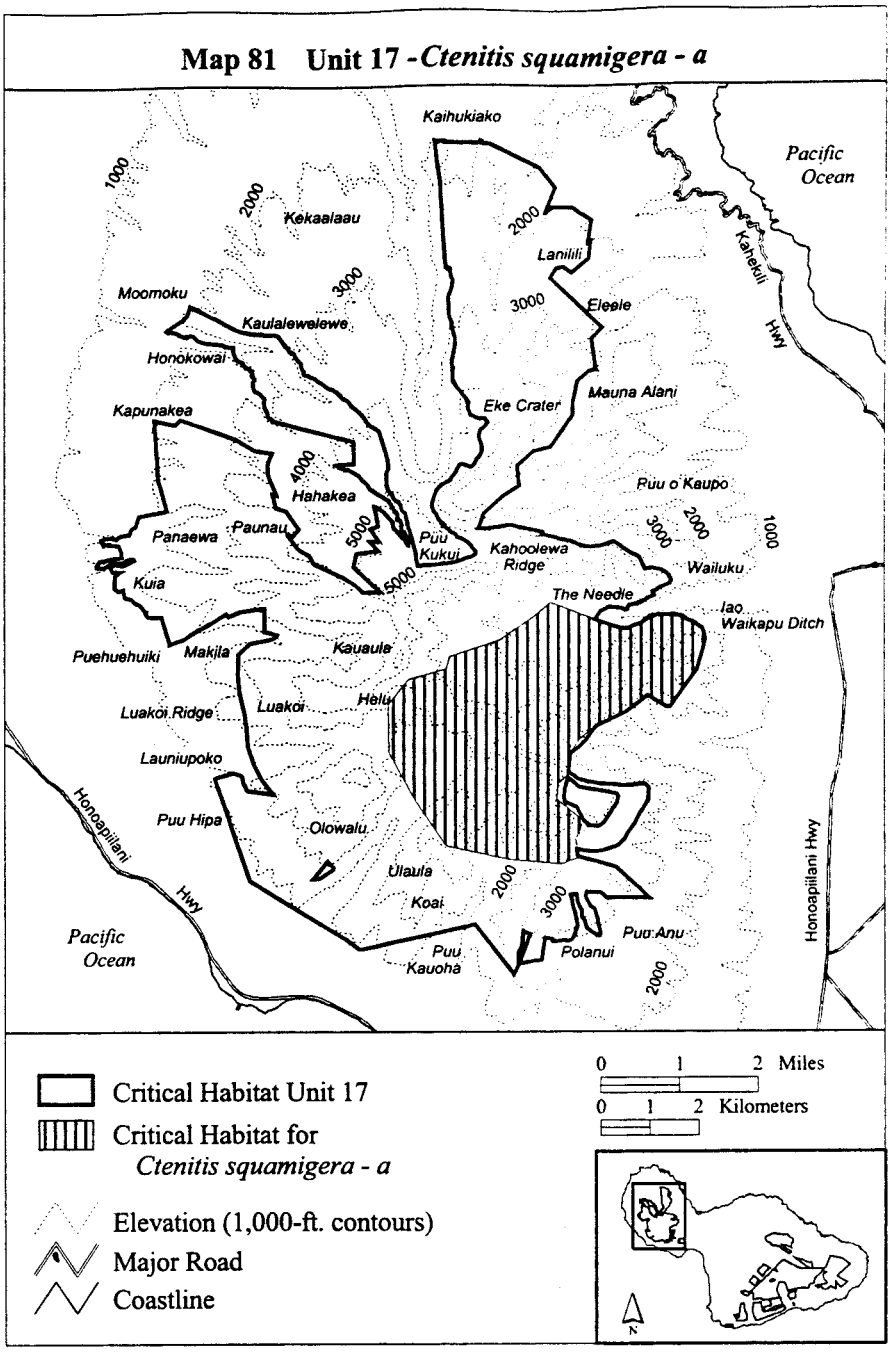
(B) **Note:** Map 80 follows:



(lxxxi) Maui 17—*Ctenitis squamigera*—a (1,979 ha; 4,891 ac).

(A) Unit consists of the following 58 boundary points: Start at 754711, 2310770; 755224, 2310599; 755234, 2310596; 755269, 2310584; 755320, 2310567; 755364, 2310585; 755366, 2310585; 755661, 2310703; 755670, 2310709; 756015, 2310849; 756300, 2310859; 756582, 2310767; 756724, 2310720; 756903, 2310594; 756939, 2310479; 756941, 2310469; 756961, 2310369; 756961, 2310368; 756967, 2310338; 756918, 2310152; 756801, 2309745; 756244, 2308954; 756153, 2308971; 755784, 2309203; 755328, 2308843; 754727, 2308566; 754703, 2308555; 754391, 2308291; 754206, 2308013; 754199, 2308002; 754164, 2307624; 754157, 2307555; 753944, 2307384; 753924, 2307060; 754322, 2306732; 754390, 2306683; 754409, 2306473; 754314, 2306226; 754335, 2306032; 754344, 2305953; 754346, 2305896; 754350, 2305895; 754350, 2305894; 754356, 2305843; 754191, 2305795; 754037, 2305734; 752927, 2305830; 751646, 2306112; 751009, 2307051; 750478, 2308025; 750460, 2309016; 750885, 2309547; 751648, 2309754; 751721, 2310011; 752535, 2310277; 752735, 2310348; 753433, 2310829; 753806, 2311124; return to starting point.

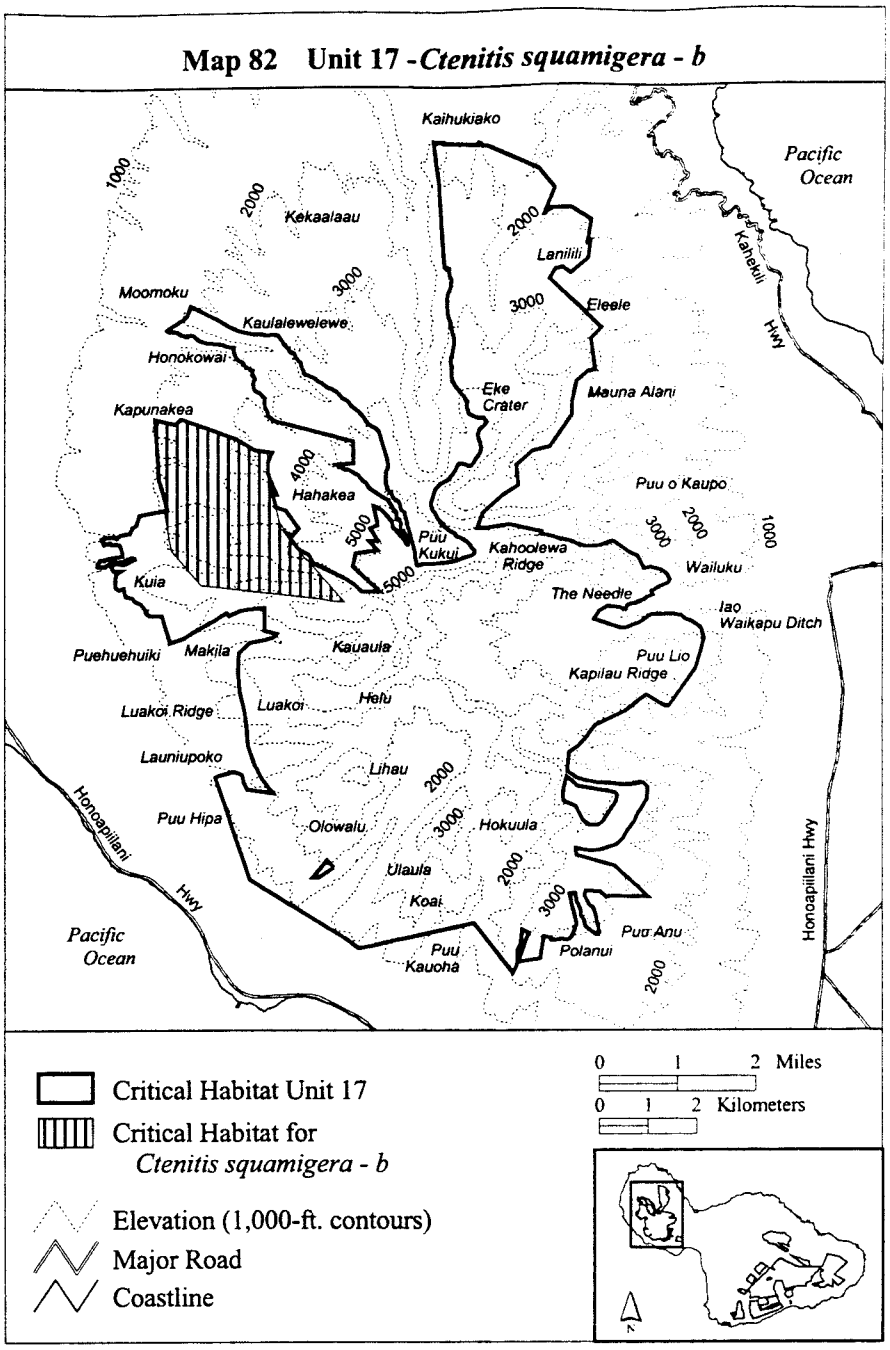
(B) **Note:** Map 81 follows:



(lxxxii) Maui 17—*Ctenitis squamigera*—b (816 ha; 2,017 ac).

(A) Unit consists of the following 33 boundary points: Start at 745855, 2313035; 745916, 2313043; 745773, 2313571; 745745, 2313671; 745742, 2313671; 745733, 2313825; 745726, 2313936; 745666, 2314939; 746095, 2314835; 746096, 2314835; 746207, 2314953; 746887, 2314706; 747359, 2314534; 747735, 2314300; 747988, 2314266; 747997, 2314050; 748006, 2313828; 748025, 2313740; 748103, 2313389; 748166, 2313105; 748233, 2312800; 748392, 2312568; 748570, 2312307; 748631, 2312228; 748652, 2312200; 748748, 2312058; 748822, 2312005; 749297, 2311460; 749584, 2311129; 749324, 2311150; 749143, 2311192; 746617, 2311468; 745999, 2312213; return to starting point.

(B) **Note:** Map 82 follows:

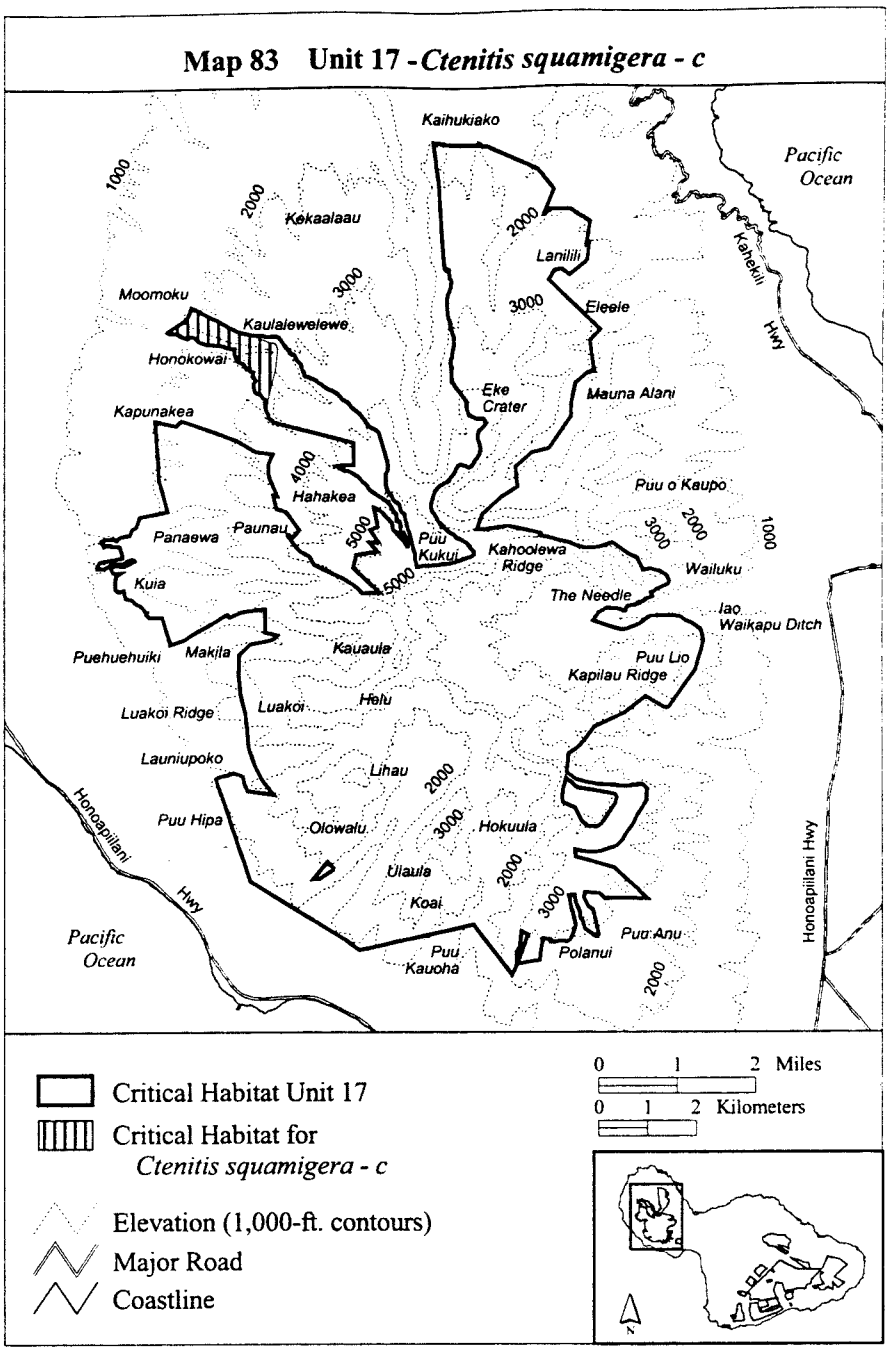


(lxxxiii) Maui 17—*Ctenitis squamigera*—c (137 ha; 338 ac).

(A) Unit consists of the following 133 boundary points: Start at 747966, 2315141; 747954, 2315161; 747942, 2315193; 747940, 2315201; 747933, 2315253; 747929, 2315289; 747930, 2315329; 747935, 2315356; 747931, 2315379; 747914, 2315403; 747887, 2315423; 747857, 2315454; 747831, 2315482; 747792, 2315504; 747750, 2315521; 747726, 2315545; 747722, 2315552; 747704, 2315583; 747698, 2315635; 747693, 2315665; 747695, 2315687; 747702, 2315718; 747713, 2315745; 747728, 2315775; 747729, 2315792; 747729, 2315793; 747717, 2315811; 747717, 2315812; 747702, 2315820; 747691, 2315827; 747681, 2315836; 747675, 2315860; 747677, 2315876; 747681, 2315899; 747681, 2315918; 747667, 2315950; 747648, 2315974; 747620, 2315996; 747585, 2316012; 747546, 2316034; 747526, 2316055; 747508, 2316086; 747494, 2316109; 747476, 2316129; 747447, 2316142; 747409, 2316159; 747389, 2316169; 747365, 2316186; 747345, 2316212; 747336, 2316228; 747328, 2316244; 747312, 2316282; 747299, 2316323; 747290, 2316361; 747289, 2316384; 747289, 2316392; 747296, 2316429; 747296, 2316430; 747296, 2316431; 747260, 2316441; 747214, 2316449; 747159, 2316459; 747125, 2316462; 747109, 2316472; 747100, 2316476; 747078, 2316500; 747077, 2316501; 747055, 2316503; 747024, 2316497; 746977, 2316510; 746946, 2316512; 746922, 2316518; 746881, 2316516; 746836, 2316520; 746786, 2316524; 746741, 2316526; 746698, 2316533; 746655, 2316550; 746617, 2316562; 746584, 2316571; 746551, 2316595; 746533, 2316622; 746505,

2316643; 746458, 2316680; 746457, 2316680; 746411, 2316689; 746410, 2316689; 746348, 2316682; 746338, 2316683; 746337, 2316682; 746335, 2316658; 746329, 2316659; 746194, 2316687; 746199, 2316707; 746200, 2316707; 746199, 2316708; 746198, 2316709; 746186, 2316712; 746160, 2316720; 746128, 2316738; 746127, 2316738; 746095, 2316749; 746058, 2316757; 746020, 2316765; 745994, 2316766; 745962, 2316761; 745913, 2316779; 745961, 2316812; 746173, 2316962; 746267, 2317022; 746270, 2317031; 746278, 2317037; 746327, 2317071; 746357, 2317155; 746377, 2317211; 746405, 2317289; 746423, 2317280; 747344, 2316808; 747450, 2316773; 747517, 2316751; 747602, 2316733; 747628, 2316729; 747715, 2316716; 747716, 2316715; 747719, 2316715; 747767, 2316674; 747991, 2316589; 748152, 2316547; 748190, 2316422; 748188, 2316396; 748181, 2316327; 748153, 2316030; 747996, 2315412; return to starting point.

(B) **Note:** Map 83 follows:

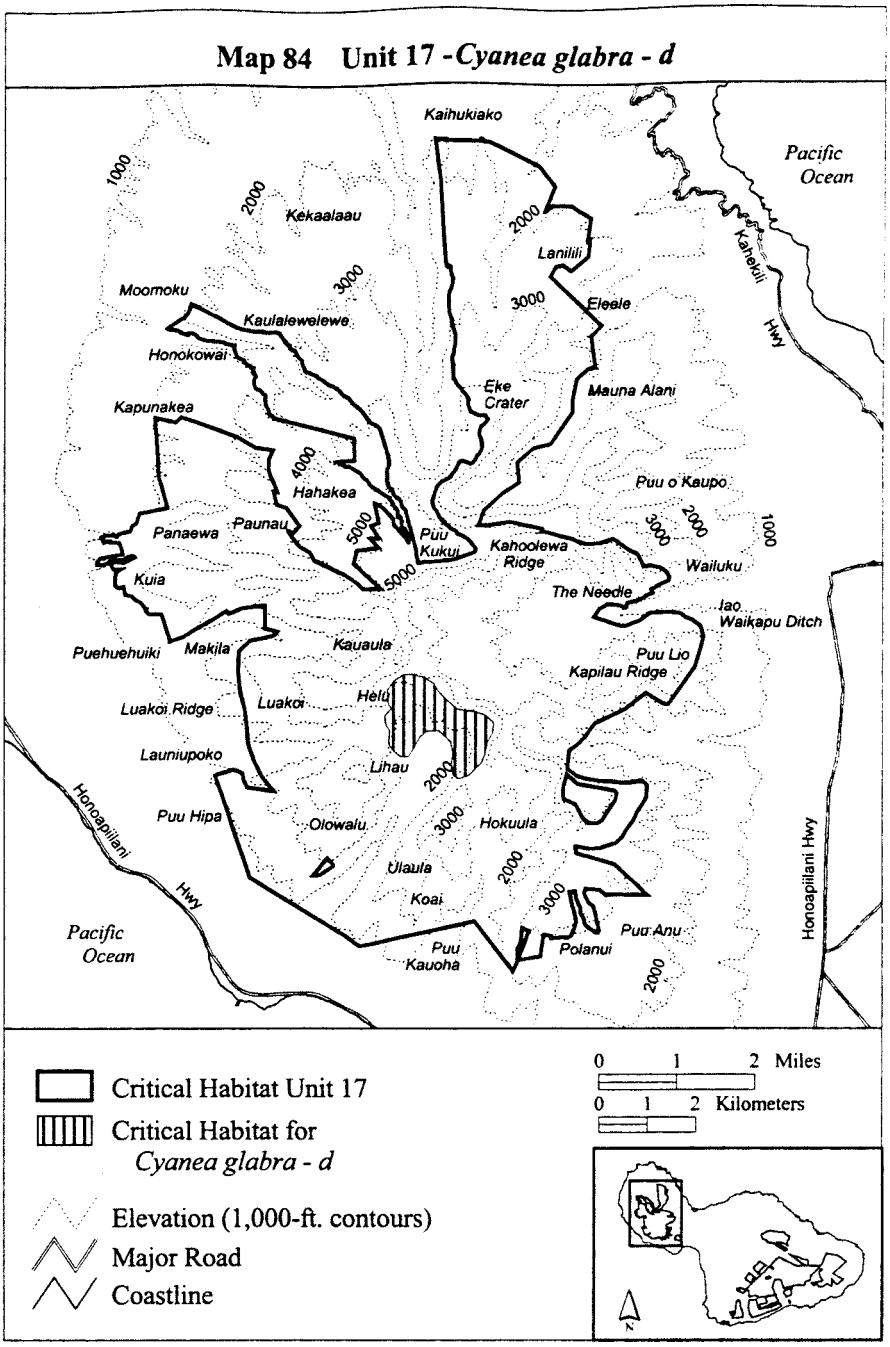


(lxxxiv) Maui 17—*Cyanea glabra*—d (255 ha; 630 ac).

(A) Unit consists of the following 36 boundary points: Start at 750480, 2308143; 750494, 2308421; 750414, 2308545; 750406, 2308713; 750523, 2308867; 750465, 2308969; 750450, 2309254; 750575, 2309437; 750794, 2309576; 750969, 2309576; 751203, 2309517; 751401, 2309386; 751474, 2309254; 751664, 2309057; 751905, 2308859; 752286, 2308801; 752468,

2308742; 752636, 2308589; 752607, 2308362; 752505, 2308165; 752461, 2307938; 752381, 2307755; 752125, 2307492; 751913, 2307434; 751803, 2307507; 751766, 2307712; 751781, 2307880; 751781, 2308019; 751744, 2308194; 751511, 2308421; 751262, 2308406; 751130, 2308296; 750969, 2308019; 750882, 2307872; 750736, 2307872; 750545, 2308026; return to starting point.

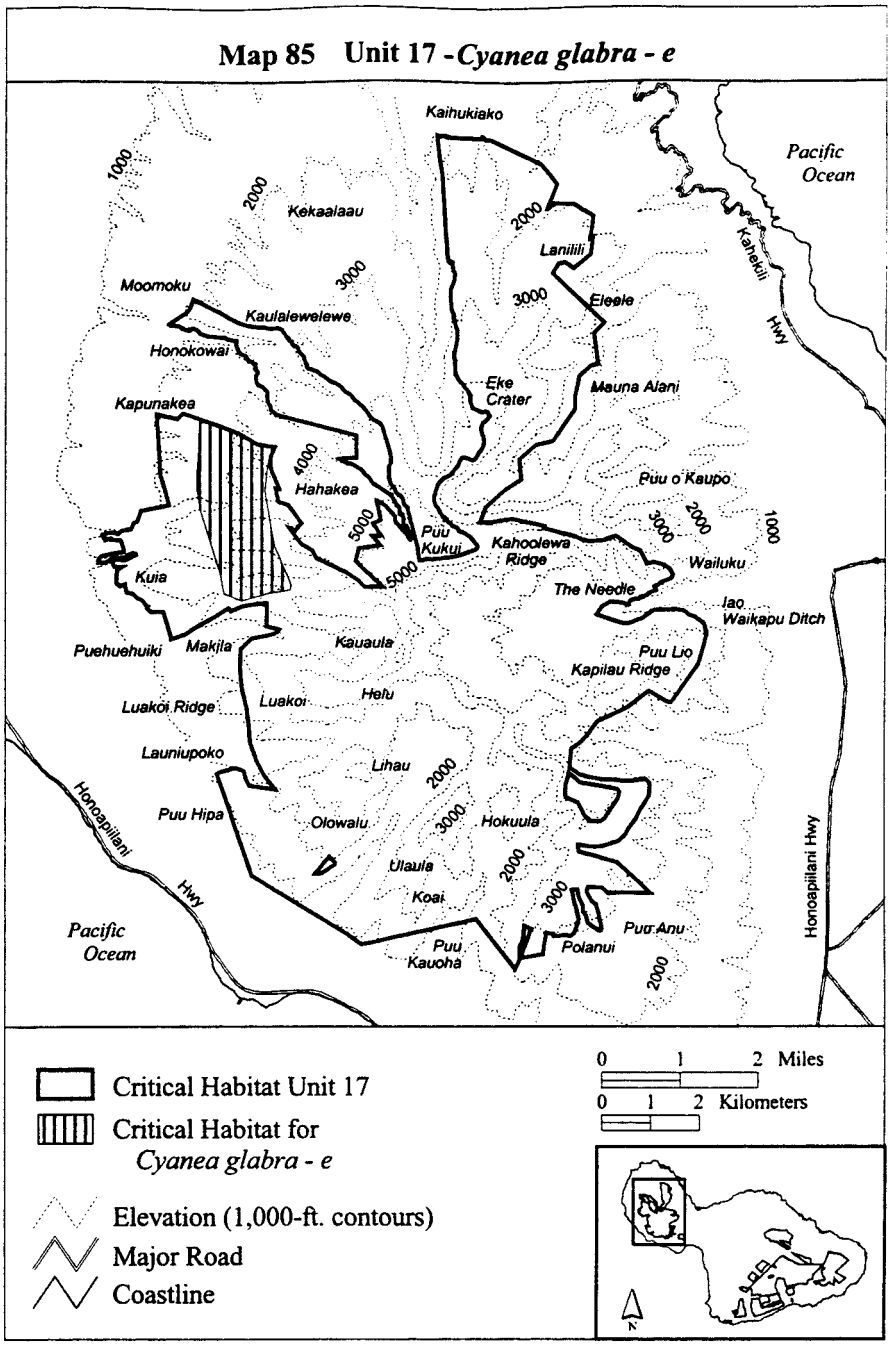
(B) **Note:** Map 84 follows:



(lxxxv) Maui 17—*Cyanea glabra*—e (470 ha; 1,163 ac).

(A) Unit consists of the following 28 boundary points: Start at 746593, 2314813; 746887, 2314706; 747359, 2314534; 747735, 2314300; 748095, 2314252; 748080, 2314231; 747997, 2314050; 747967, 2313985; 747921, 2313749; 747890, 2313343; 748044, 2312415; 748090, 2312169; 748396, 2311456; 748418, 2311379; 748403, 2311287; 748254, 2311251; 747983, 2311220; 747495, 2311082; 747412, 2311052; 747044, 2311200; 746967, 2311589; 746567, 2312918; 746485, 2313343; 746485, 2313738; 746526, 2314164; 746521, 2314359; 746546, 2314733; 746555, 2314791; return to starting point.

(B) **Note:** Map 85 follows:

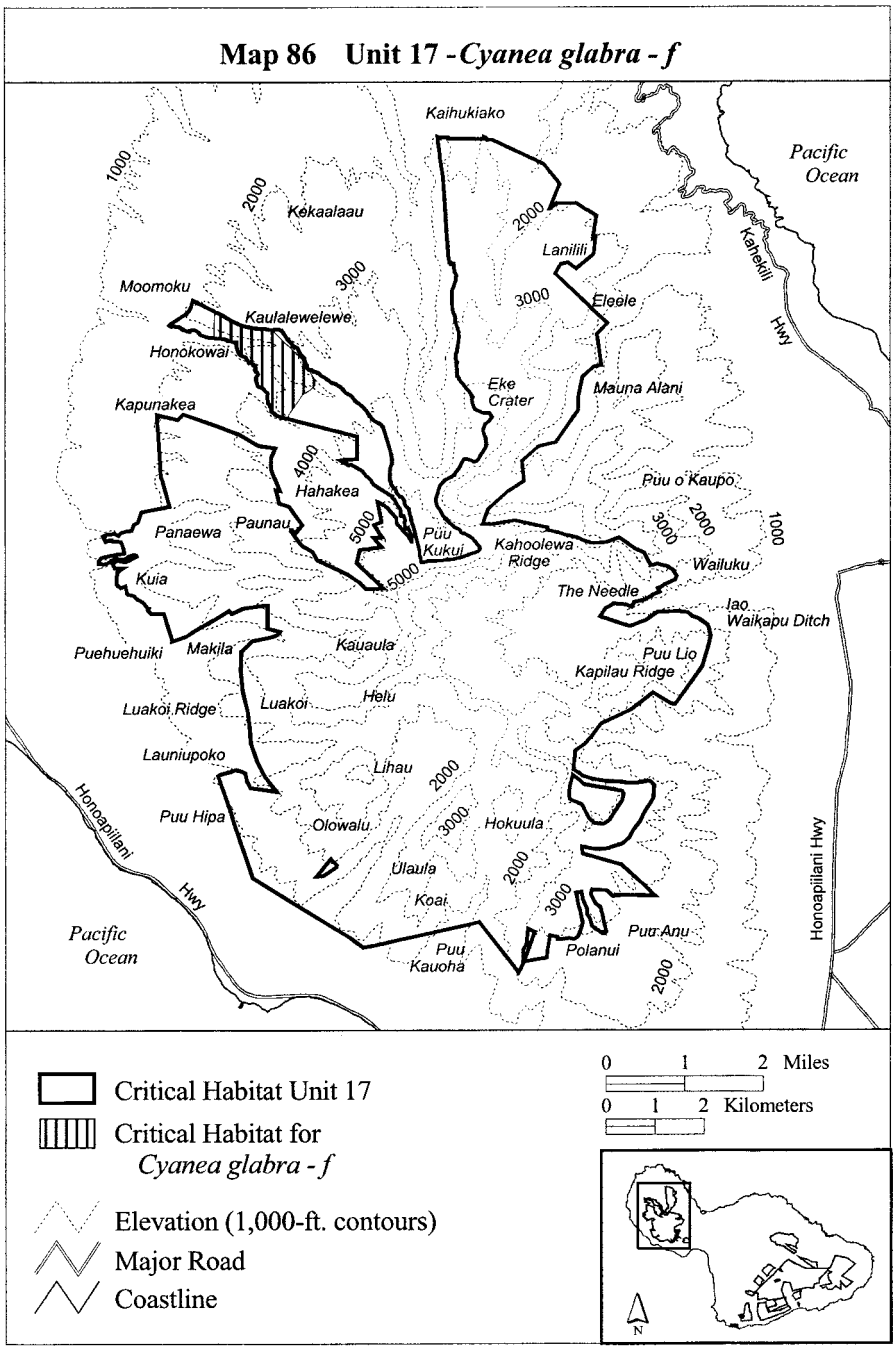


(lxxxvi) Maui 17—*Cyanea glabra*—f (188 ha; 465 ac).

(A) Unit consists of the following 122 boundary points: Start at 748090, 2314947; 748089, 2314948; 748069, 2314973; 748068, 2314973; 748029, 2314987; 748007, 2315005; 748001, 2315029; 748005, 2315065; 748005, 2315083; 747994, 2315106; 747975, 2315127; 747954, 2315161; 747942, 2315193; 747940, 2315201; 747933, 2315253; 747929, 2315289; 747930, 2315329; 747935, 2315356; 747931, 2315379; 747914, 2315403; 747887, 2315423; 747857, 2315454; 747831, 2315482; 747792, 2315504; 747750, 2315521; 747726, 2315545; 747722, 2315552; 747704, 2315583; 747698, 2315635; 747693, 2315665; 747695, 2315687; 747702, 2315718; 747713, 2315745; 747728, 2315775; 747729, 2315792; 747729, 2315793; 747717, 2315811; 747717, 2315812; 747697, 2315822; 747681, 2315836; 747675, 2315860; 747677, 2315876; 747681, 2315899; 747681, 2315918; 747667, 2315950; 747648, 2315974; 747620, 2315996; 747585, 2316012; 747546, 2316034; 747526, 2316055; 747508, 2316086; 747494, 2316109; 747476, 2316129; 747447, 2316142; 747409, 2316159; 747389, 2316169; 747365, 2316186; 747345, 2316212; 747336, 2316228; 747328, 2316244; 747312, 2316282; 747299, 2316323; 747290, 2316361; 747289, 2316384; 747289, 2316392; 747296, 2316429; 747296, 2316430; 747296, 2316431; 747260, 2316441; 747214, 2316449; 747159, 2316459; 747125, 2316462; 747109, 2316472; 747100, 2316476; 747078, 2316500; 747077, 2316501; 747055, 2316503; 747024, 2316497; 746977, 2316510; 746946, 2316512; 746922, 2316518; 746881, 2316516; 746836,

2316520; 746828, 2316521; 746834, 2316631; 746839, 2316939; 746859, 2317060; 746968, 2317006; 747190, 2316887; 747229, 2316866; 747344, 2316808; 747418, 2316781; 747450, 2316773; 747628, 2316729; 747716, 2316715; 747717, 2316715; 747733, 2316713; 747829, 2316717; 747887, 2316715; 747903, 2316702; 747932, 2316692; 747932, 2316691; 747967, 2316688; 748003, 2316690; 748029, 2316693; 748649, 2316082; 748735, 2315935; 748738, 2315922; 748743, 2315901; 748750, 2315885; 748758, 2315876; 748759, 2315875; 748770, 2315868; 748775, 2315867; 748793, 2315836; 748906, 2315667; 748901, 2315549; 748798, 2315451; 748660, 2315374; 748372, 2314933; 748352, 2314863; 748326, 2314870; return to starting point.

(B) **Note:** Map 86 follows:

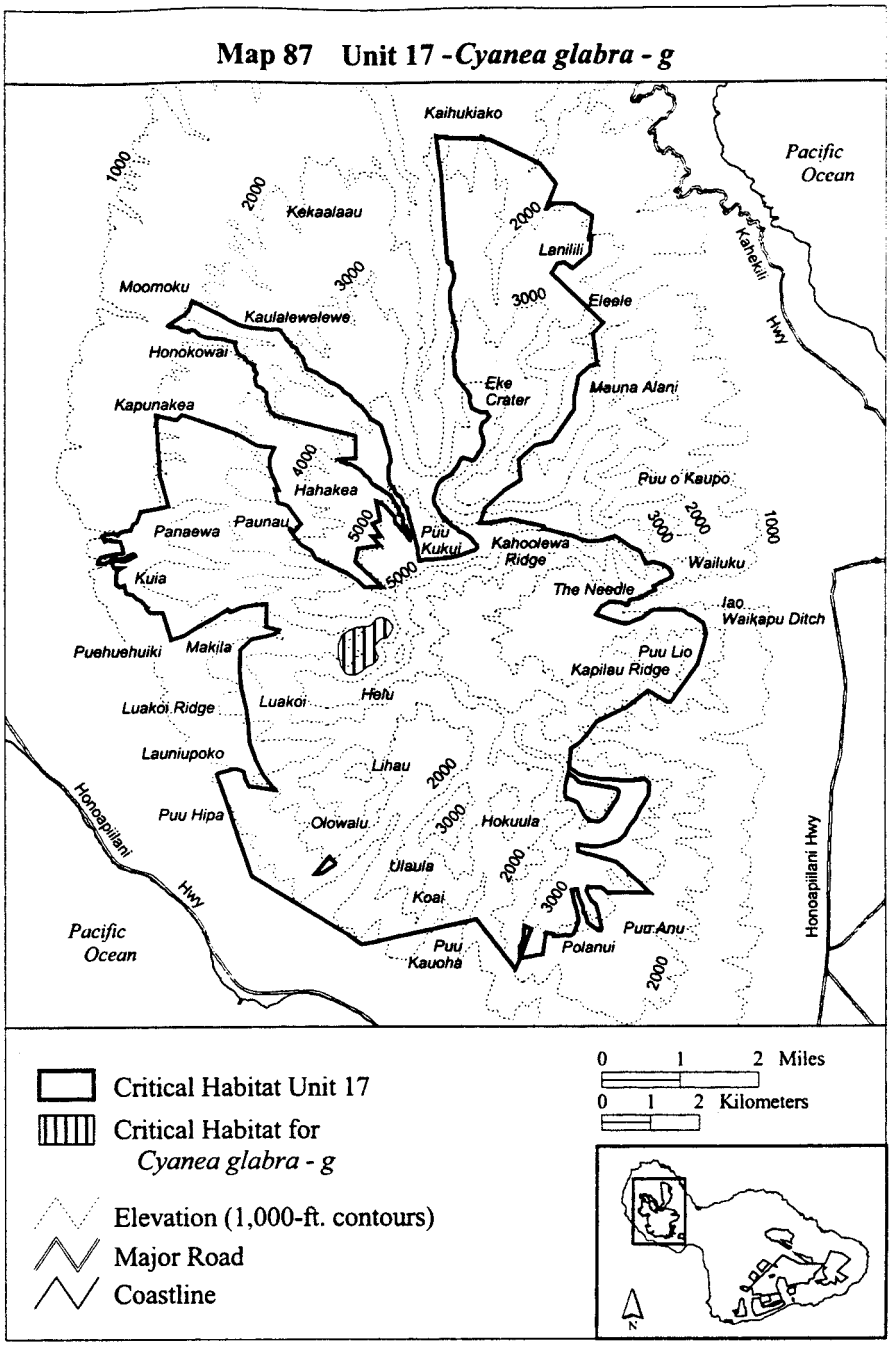


(lxxxvii) Maui 17—*Cyanea glabra*—g (79 ha; 195 ac).

(A) Unit consists of the following 33 boundary points: Start at 749398, 2310143; 749470, 2310348; 749639, 2310451; 749793, 2310523; 750055, 2310548; 750137, 2310615; 750188, 2310687; 750190, 2310697; 750274, 2310725; 750348, 2310711; 750440, 2310656; 750505, 2310582; 750523, 2310503; 750496, 2310420; 750440, 2310332; 750385, 2310295; 750292, 2310277; 750204, 2310203; 750149, 2310105; 750167, 2310022; 750223, 2309925; 750209, 2309842; 750144,

2309773; 750006, 2309708; 749881, 2309611; 749770, 2309532; 749691, 2309527; 749585, 2309541; 749502, 2309629; 749437, 2309759; 749444, 2309766; 749408, 2309876; 749398, 2309979; return to starting point.

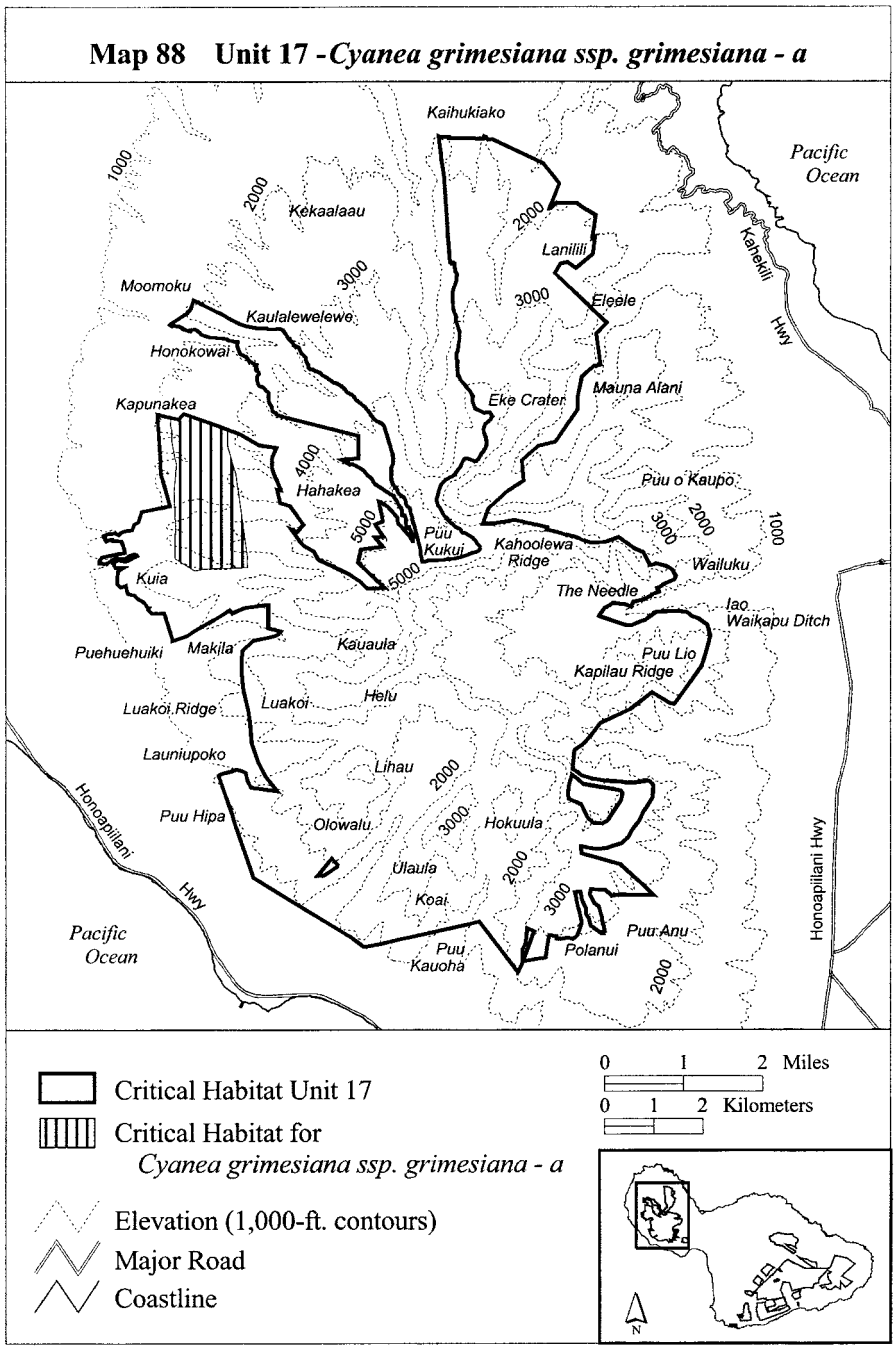
(B) **Note:** Map 87 follows:



(lxxxviii) Maui 17—*Cyanea grimesiana* ssp. *grimesiana*—a (920 ha; 2,273 ac).

(A) Unit consists of the following 26 boundary points: Start at 755402, 2311063; 755355, 2310968; 755230, 2311019; 755226, 2311019; 754833, 2311178; 753854, 2311761; 753088, 2311437; 753109, 2310920; 752629, 2309941; 753391, 2309839; 754118, 2310001; 755127, 2310494; 755241, 2309743; 754863, 2309251; 753812, 2308620; 751175, 2309545; 751031, 2309863; 750935, 2311100; 751464, 2311599; 751968, 2311905; 753055, 2312211; 753463, 2312289; 754058, 2312313; 754688, 2312061; 755127, 2311731; 755547, 2311353; return to starting point.

(B) **Note:** Map 88 follows:

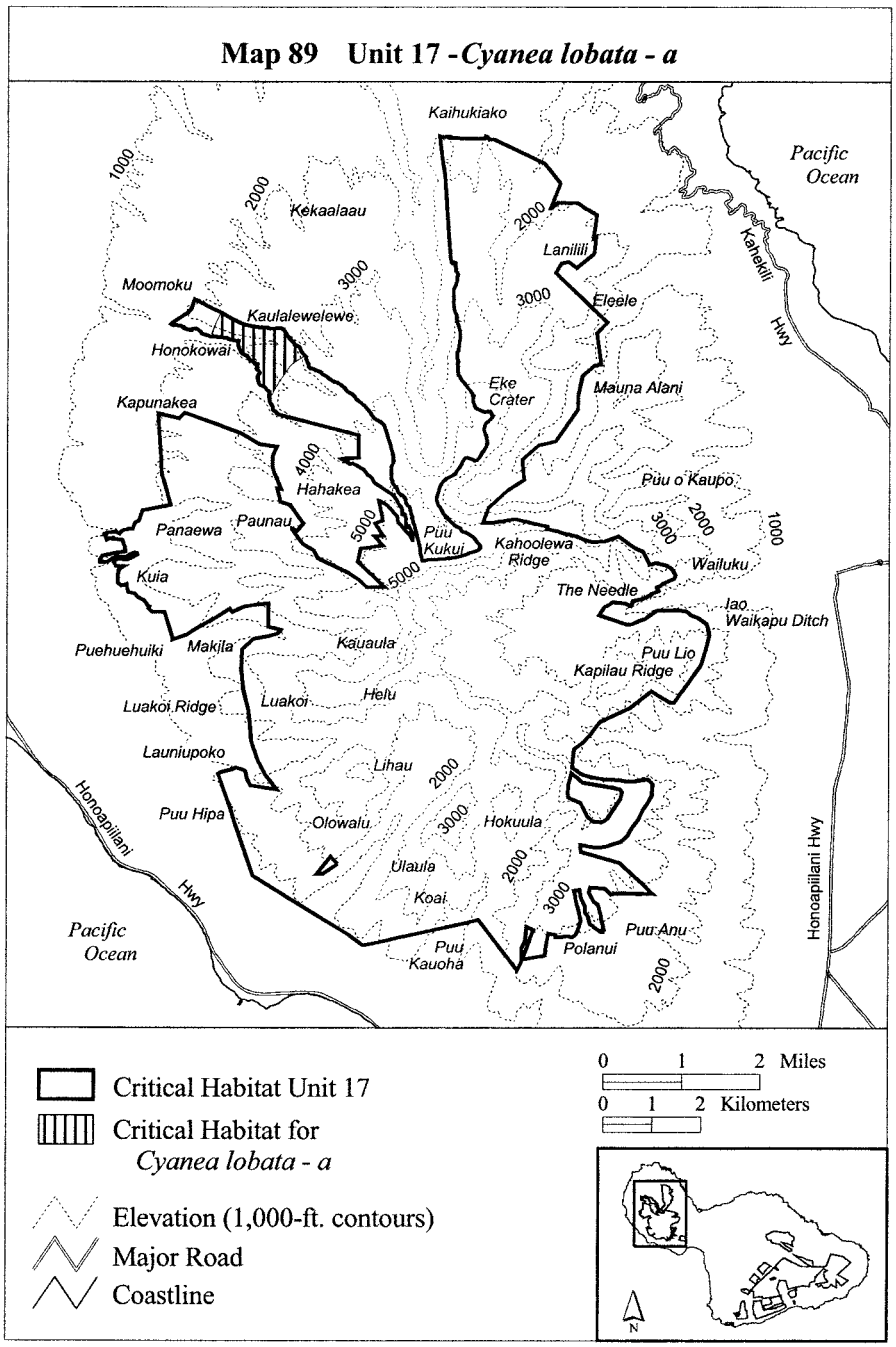


(lxxxix) Maui 17—*Cyanea lobata*—a (131 ha; 324 ac).

(A) Unit consists of the following 133 boundary points: Start at 747973, 2315130; 747957, 2315156; 747952, 2315167; 747942, 2315193; 747940, 2315201; 747933, 2315253; 747929, 2315289; 747930, 2315329; 747935, 2315356; 747931, 2315379; 747914, 2315403; 747887, 2315423; 747857, 2315454; 747831, 2315482; 747792, 2315504; 747750, 2315521; 747726, 2315545; 747722, 2315552; 747704, 2315583; 747698, 2315635; 747693, 2315665; 747695, 2315687; 747702, 2315718; 747713, 2315745; 747728, 2315775; 747729, 2315792; 747729, 2315793; 747717, 2315811; 747717, 2315812; 747697, 2315822; 747681, 2315836; 747675, 2315860; 747677, 2315876; 747681, 2315899; 747681, 2315918; 747667, 2315950; 747648, 2315974; 747620, 2315996; 747585, 2316012; 747546, 2316034; 747526, 2316055; 747508, 2316086; 747494, 2316109; 747476, 2316129; 747447, 2316142; 747409, 2316159; 747389, 2316169; 747365, 2316186; 747345, 2316212; 747336, 2316228; 747328, 2316244; 747312, 2316282; 747299, 2316323; 747290, 2316361; 747289, 2316384; 747289, 2316392; 747296, 2316429; 747296, 2316430; 747296, 2316431; 747260, 2316441; 747214, 2316449; 747159, 2316459; 747125, 2316462; 747109, 2316472; 747103, 2316475; 747094, 2316483; 747078, 2316500; 747077, 2316501; 747055, 2316503; 747024, 2316497; 746977, 2316510; 746946, 2316512; 746922, 2316518; 746881, 2316516; 746850, 2316519; 746759, 2316594; 746828, 2316776; 746943, 2317018; 747229, 2316866; 747344, 2316808; 747418, 2316781; 747517, 2316751; 747602,

2316733; 747628, 2316729; 747716, 2316715; 747717, 2316715; 747733, 2316713; 747887, 2316715; 747903, 2316702; 747932, 2316692; 747932, 2316691; 747967, 2316688; 748003, 2316690; 748041, 2316695; 748056, 2316696; 748113, 2316703; 748141, 2316706; 748159, 2316704; 748168, 2316702; 748201, 2316684; 748211, 2316678; 748218, 2316670; 748236, 2316643; 748254, 2316624; 748267, 2316607; 748276, 2316584; 748310, 2316551; 748349, 2316494; 748389, 2316441; 748415, 2316408; 748446, 2316368; 748446, 2316367; 748505, 2316331; 748531, 2316319; 748548, 2316311; 748549, 2316310; 748562, 2316282; 748574, 2316250; 748575, 2316245; 748585, 2316225; 748587, 2316220; 748589, 2316217; 748596, 2316201; 748610, 2316189; 748613, 2316186; 748649, 2316141; 748655, 2316134; 748446, 2315991; 748398, 2315949; 748126, 2315586; 748029, 2315400; 748003, 2315327; 747976, 2315313; return to starting point.

(B) **Note:** Map 89 follows:

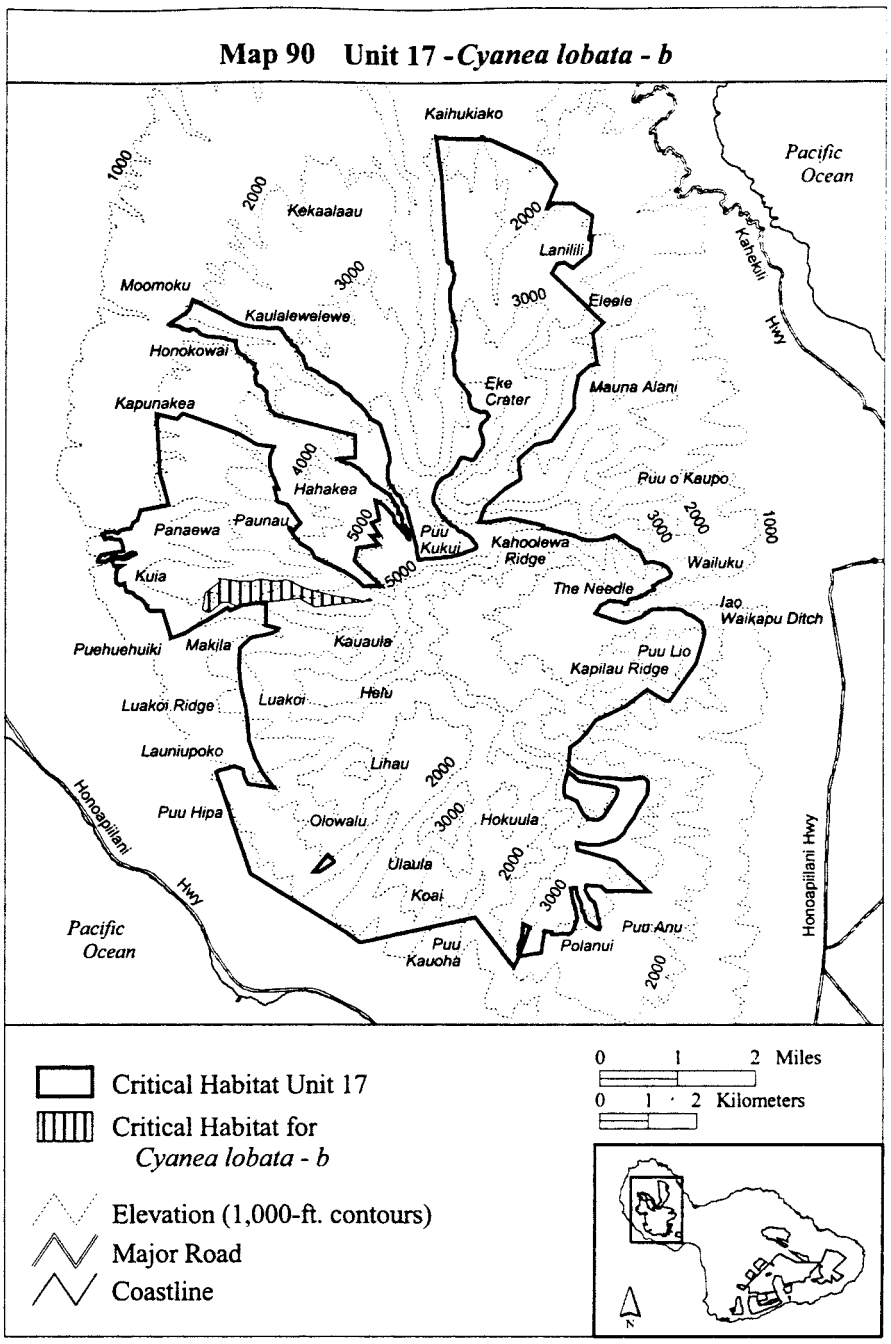


(xc) Maui 17—*Cyanea lobata*—b (114 ha; 282 ac).

(A) Unit consists of the following 35 boundary points: Start at 747903, 2311009; 747443, 2310953; 747432, 2310952; 747407, 2310938; 747319, 2310932; 747154, 2311018; 747024, 2311018; 746814, 2310852; 746755, 2310801; 746678, 2310811; 746652, 2310844; 746630, 2310853; 746617, 2310888; 746652, 2311053; 746661, 2311200; 746971, 2311433; 746952,

2311505; 747422, 2311441; 747662, 2311441; 747812, 2311501; 748142, 2311441; 748322, 2311471; 748472, 2311441; 748564, 2311384; 748784, 2311284; 748999, 2311226; 749324, 2311150; 749769, 2311083; 749908, 2311040; 749987, 2311042; 750063, 2311077; 750068, 2311092; 750118, 2311050; 748942, 2310916; 748618, 2311096; return to starting point.

(B) **Note:** Map 90 follows:

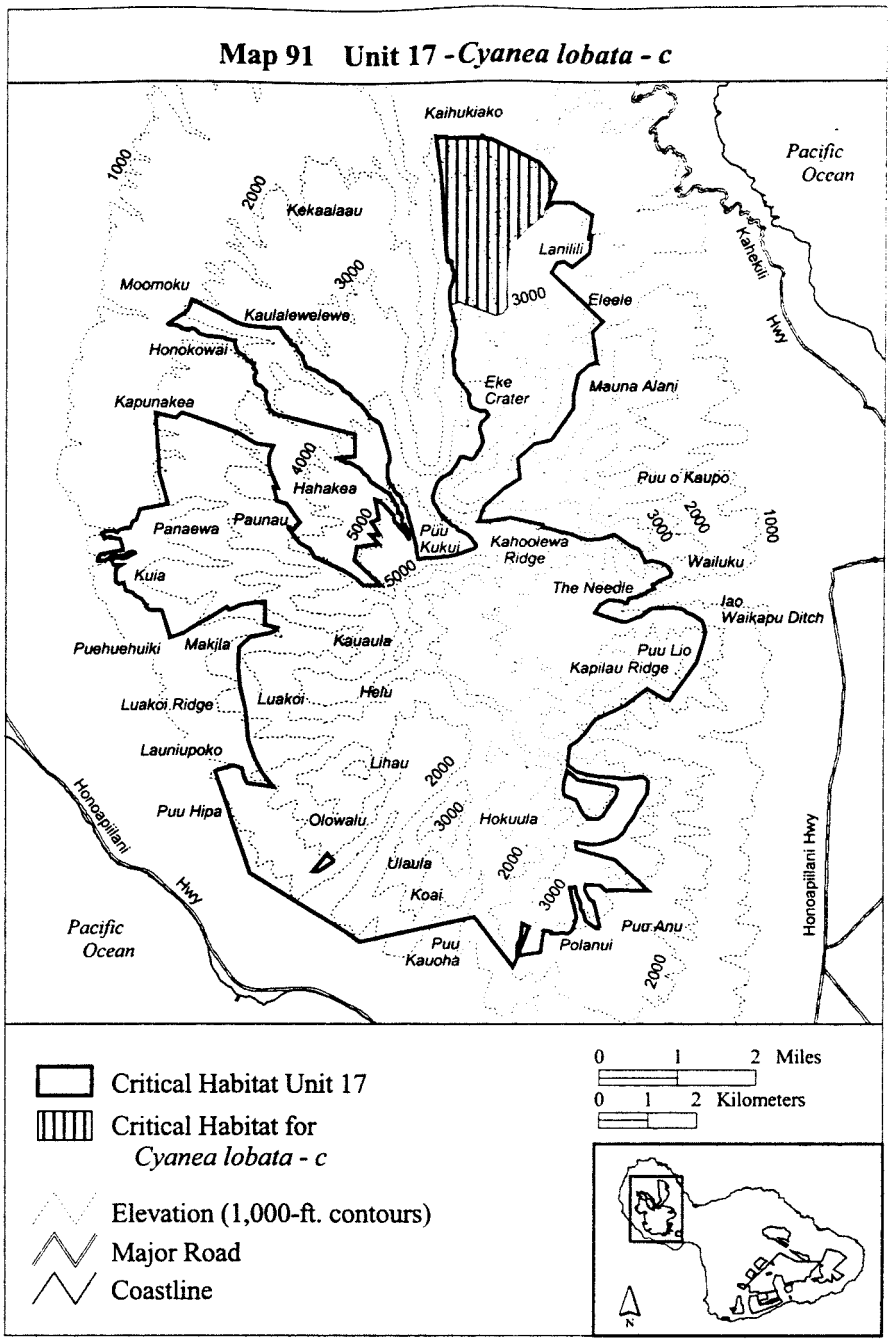


(xci) Maui 17—*Cyanea lobata*—c (578 ha; 1,427 ac).

(A) Unit consists of the following 62 boundary points: Start at 751691, 2317255; 751693, 2317261; 751698, 2317290; 751694, 2317322; 751695, 2317366; 751697, 2317415; 751702, 2317462; 751715, 2317522; 751728, 2317571; 751747, 2317619; 751767, 2317682; 751769, 2317710; 751778, 2317751; 751782, 2317790; 751782, 2317791; 751769, 2317829; 751750, 2317859; 751741, 2317901; 751738, 2317949; 751738, 2317997; 751730, 2318034; 751729, 2318035; 751714, 2318045; 751713, 2318046; 751712, 2318046; 751690, 2318034; 751665, 2318030; 751651, 2318051; 751640, 2318085; 751632, 2318124; 751599, 2318608; 751517, 2319810; 751458, 2320230; 751458, 2320252; 751458, 2320253; 751454, 2320260; 751411, 2320566; 751406, 2320602; 751619, 2320598; 752334, 2320586; 752403, 2320585; 752415, 2320564; 752418, 2320564; 752509, 2320573; 752522, 2320567; 753547, 2320078; 753862, 2319691; 753884, 2319664; 753681, 2319159; 753622, 2319012; 753234, 2318678; 753089, 2318512; 752913,

2318248; 752876, 2317830; 752886, 2317088; 752845, 2317055; 752810, 2316993; 752718, 2316956; 752684, 2316929; 752465, 2317006; 751895, 2317211; 751704, 2317136; return to starting point.

(B) **Note:** Map 91 follows:

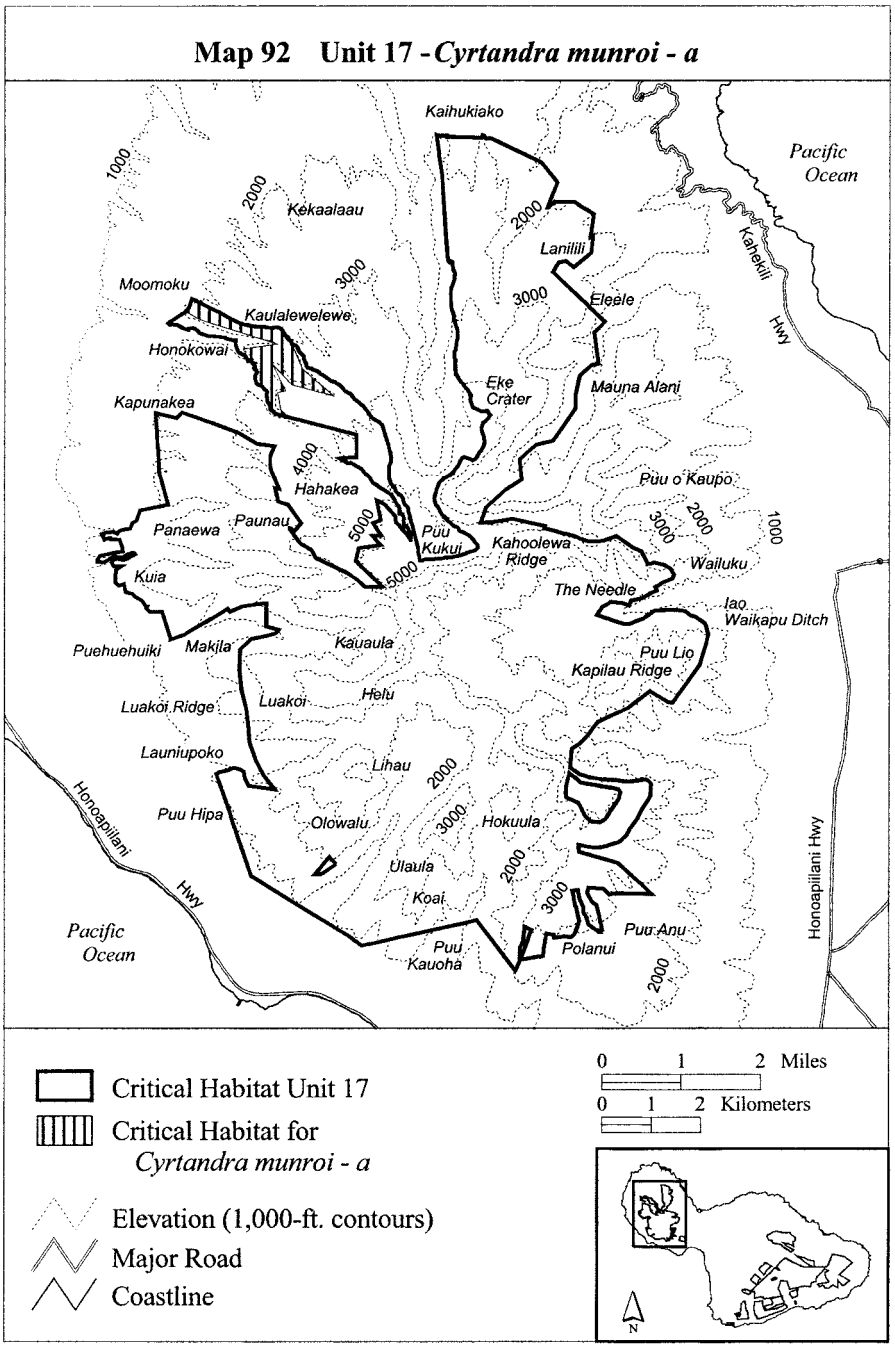


(xcii) Maui 17—*Cyrtandra munroi*—a (156 ha; 386 ac).

(A) Unit consists of the following 95 boundary points: Start at 748364, 2314860; 748184, 2314906; 748126, 2314931; 748112, 2314937; 748019, 2315110; 747987, 2315114; 747975, 2315127; 747954, 2315161; 747942, 2315193; 747940, 2315201; 747933, 2315253; 747929, 2315289; 747930, 2315329; 747935, 2315356; 747931, 2315379; 747914, 2315403; 747887, 2315423; 747857, 2315454; 747831, 2315482; 747792, 2315504; 747750, 2315521; 747726, 2315545; 747722, 2315552; 747704, 2315583; 747698, 2315635; 747693, 2315665; 747695, 2315687; 747702, 2315718; 747713, 2315745; 747728, 2315775; 747728, 2315776; 747736, 2315775; 747729, 2315788; 747729, 2315792; 747729, 2315793; 747717, 2315811; 747717, 2315812; 747711, 2315815; 747676, 2315871; 747677, 2315876; 747681, 2315899; 747681, 2315918; 747667, 2315950; 747648, 2315974; 747620, 2315996; 747594, 2316008; 747441, 2316258; 748156, 2316363; 746590, 2316862; 746278, 2317037; 746327, 2317071; 746397, 2317266; 746423,

2317280; 746706, 2317135; 747190, 2316887; 747344, 2316808; 747418, 2316781; 747517, 2316751; 747602, 2316733; 747628, 2316729; 747716, 2316715; 747717, 2316715; 747733, 2316713; 747829, 2316717; 747887, 2316715; 747903, 2316702; 747932, 2316692; 747932, 2316691; 747967, 2316688; 748003, 2316690; 748041, 2316695; 748056, 2316696; 748113, 2316703; 748141, 2316706; 748159, 2316704; 748168, 2316702; 748201, 2316684; 748211, 2316678; 748218, 2316670; 748236, 2316643; 748254, 2316624; 748267, 2316607; 748276, 2316584; 748310, 2316551; 748349, 2316494; 748389, 2316441; 748415, 2316408; 748434, 2316383; 748660, 2315859; 749291, 2315291; 748450, 2315523; 748051, 2315943; 748324, 2315397; 748156, 2315355; 748219, 2314997; return to starting point.

(B) **Note:** Map 92 follows:

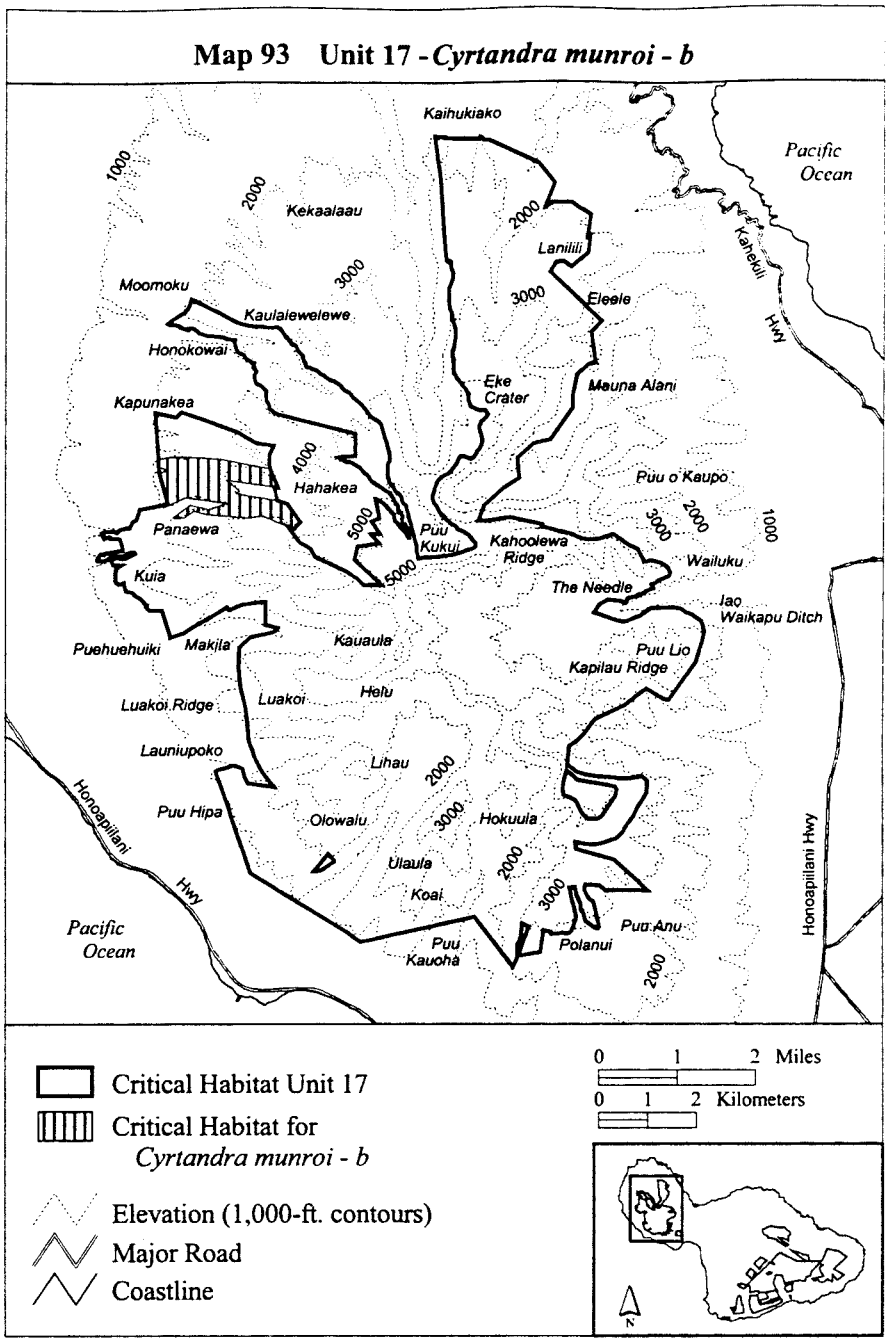


(xciii) Maui 17—*Cyrtandra munroi*—b (238 ha; 589 ac).

(A) Unit consists of the following 40 boundary points: Start at 745826, 2313019; 745846, 2313034; 745916, 2313043; 745773, 2313571; 745748, 2313661; 745886, 2313757; 745733, 2313825; 745730, 2313826; 745724, 2313911; 745726, 2313936; 745729, 2313970; 745961, 2314006; 746362, 2314006; 746980, 2313974; 748012, 2313772; 748025, 2313740; 748177, 2313379; 748103, 2313389; 747126, 2313526; 747399, 2313295; 747315, 2313253; 748093, 2313127; 748166, 2313105; 748366, 2313043; 748639, 2312664; 748513, 2312517; 748392, 2312568; 747862, 2312790; 747601,

2312741; 746746, 2312824; 746468, 2312889; 746275, 2312760; 746103, 2312739; 746034, 2312754; 746391, 2313022; 746769, 2312917; 747126, 2313043; 746286, 2313169; 745836, 2312964; 745821, 2313015; return to starting point.

(B) **Note:** Map 93 follows:

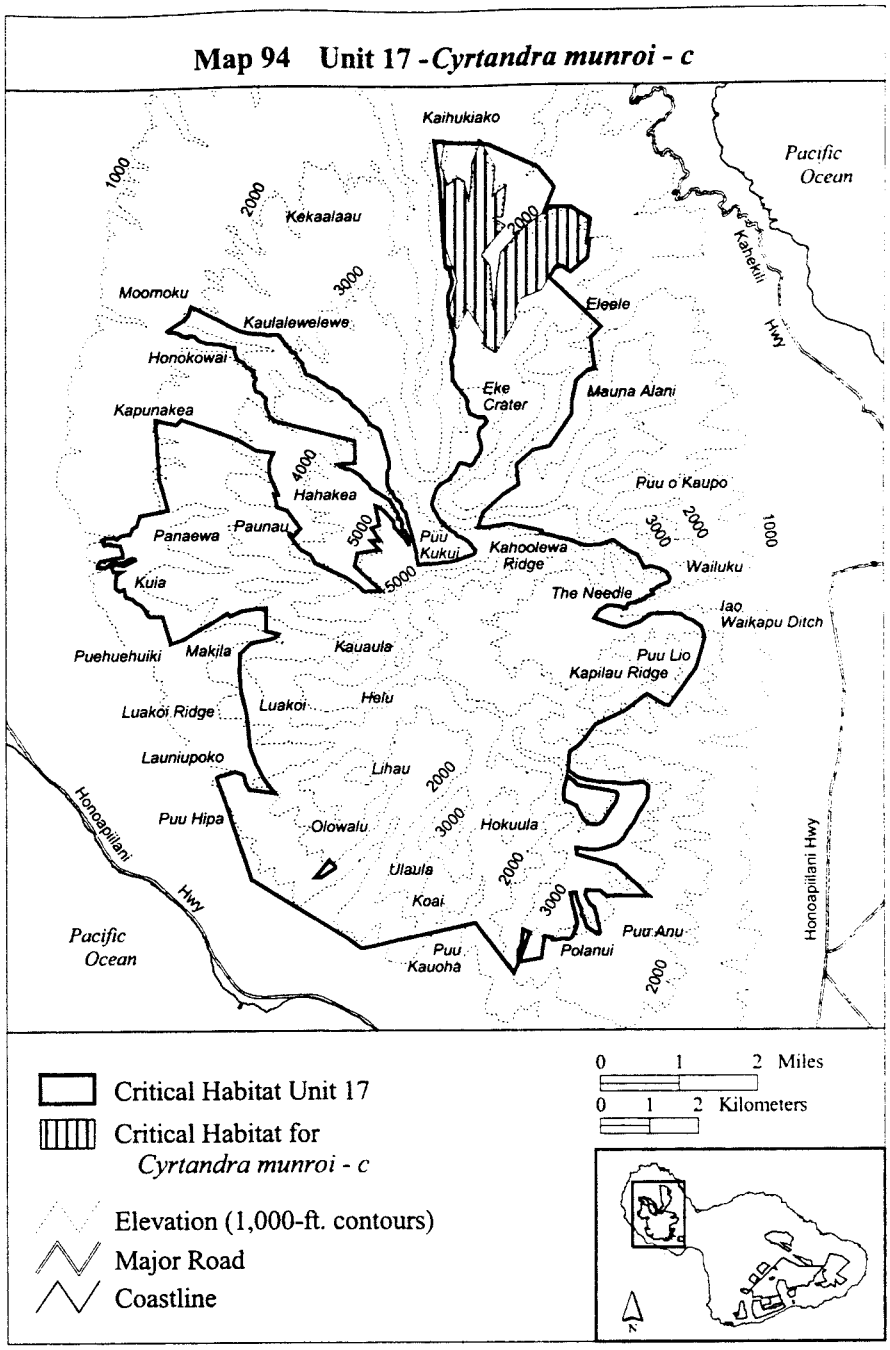


(xciv) Maui 17—*Cyrtandra munroi*—c (603 ha; 1,490 ac).

(A) Unit consists of the following 62 boundary points: Start at 751599, 2318608; 751517, 2319810; 751458, 2320238; 751458, 2320252; 751458, 2320253; 751454, 2320260; 751411, 2320566; 751402, 2320630; 751430, 2320630; 751624, 2320630; 751619, 2320598; 751540, 2320146; 751687, 2319726; 751897, 2319894; 752023, 2319831; 752128, 2319390; 752191, 2319978; 752191, 2320188; 752380, 2320629; 752380, 2320630; 752418, 2320564; 752675, 2320125; 752612, 2319495; 752906, 2319726; 752843, 2319096; 752654, 2319053; 752885, 2318906; 752401, 2318318; 752570, 2318087; 752633, 2317183; 752780, 2318339; 753263, 2318864; 753681, 2319159; 753684, 2319161; 753684, 2319160; 753831, 2319264; 754230, 2319264; 754381, 2319169; 754437, 2319134; 754441, 2319131; 754485, 2319104; 754628, 2319014; 754566, 2318549; 754622, 2318566; 754580, 2318228; 754222, 2317936; 754060, 2318058; 753962, 2318131; 753902, 2318028; 753788, 2317835; 753638, 2317579; 753215, 2317416; 753086,

2317157; 753119, 2317020; 752717, 2316300; 752443, 2316447; 752443, 2316679; 752107, 2317204; 751897, 2316784; 751861, 2316826; 751721, 2317157; 751884, 2317774; return to starting point.

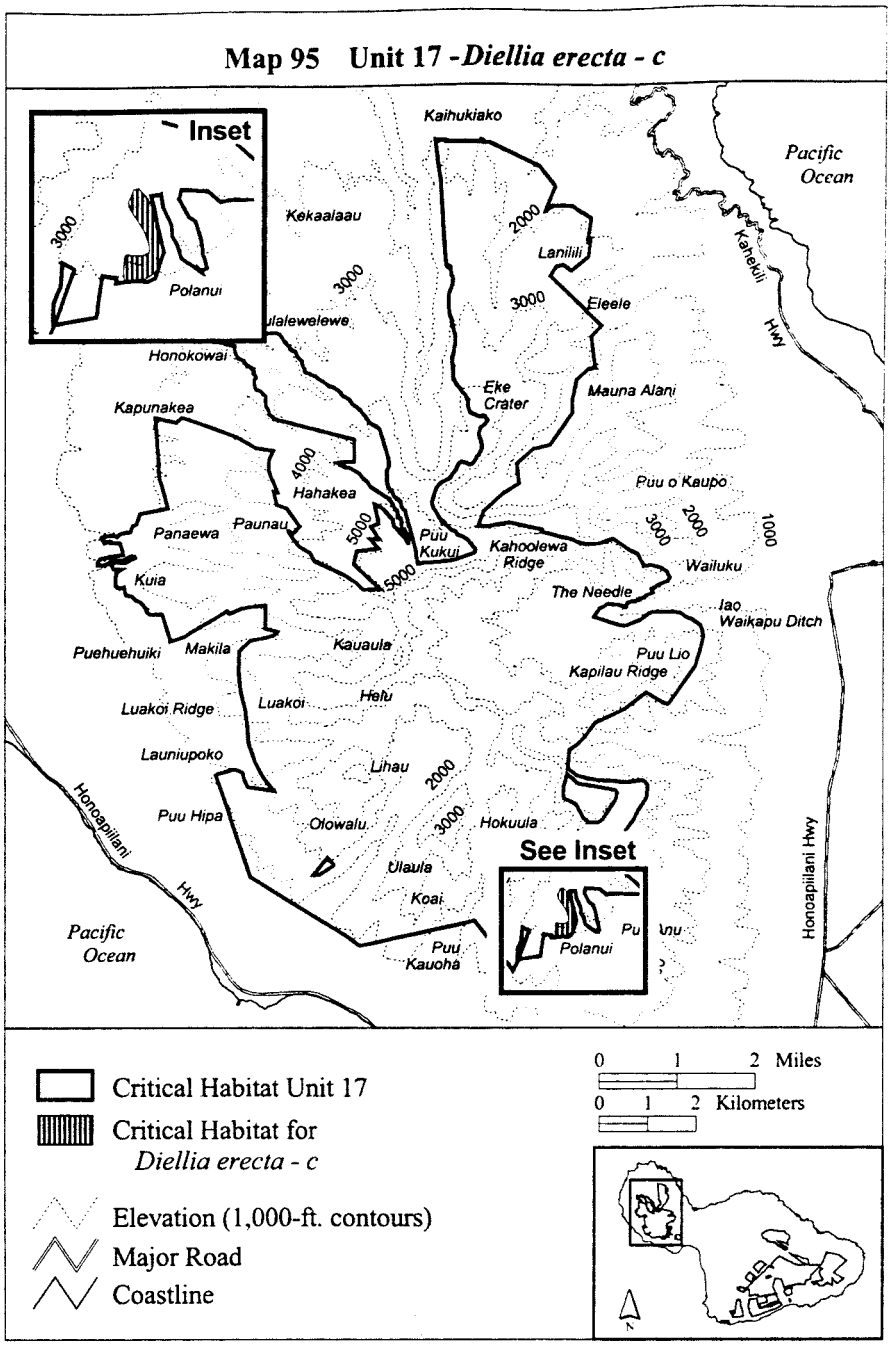
(B) **Note:** Map 94 follows:



(xcv) Maui 17—*Diellia erecta*—c (22 ha; 55 ac).

(A) Unit consists of the following 28 boundary points: Start at 754348, 2304465; 754342, 2304448; 754333, 2304422; 754330, 2304413; 754327, 2304404; 754314, 2304365; 754306, 2304342; 754244, 2304245; 754151, 2304186; 753923, 2304157; 753916, 2304179; 753904, 2304271; 753923, 2304437; 753945, 2304452; 753997, 2304441; 754126, 2304441; 754188, 2304474; 754185, 2304570; 754133, 2304717; 753971, 2304953; 753963, 2305019; 754019, 2305159; 754078, 2305174; 754177, 2305056; 754236, 2304923; 754258, 2304820; 754258, 2304743; 754306, 2304647; return to starting point.

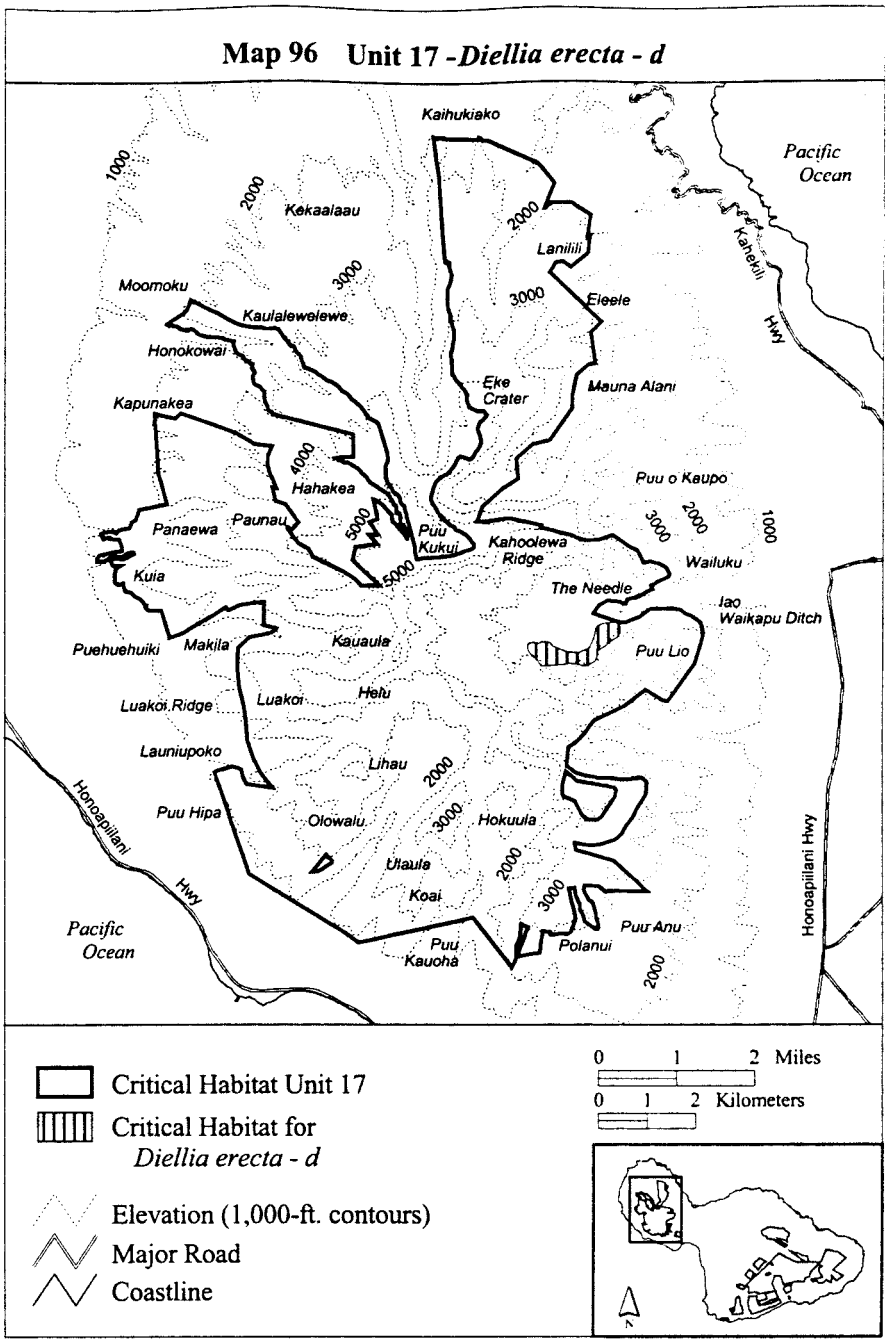
(B) **Note:** Map 95 follows:



(xcvi) Maui 17—*Diellia erecta*—d (70 ha; 172 ac).

(A) Unit consists of the following 36 boundary points: Start at 755224, 2310599; 755233, 2310600; 755234, 2310596; 755254, 2310511; 755254, 2310380; 755223, 2310289; 755066, 2310201; 754953, 2310084; 754848, 2310040; 754796, 2309997; 754796, 2309936; 754748, 2309779; 754591, 2309692; 754495, 2309692; 754404, 2309722; 754277, 2309731; 754216, 2309744; 754129, 2309718; 753641, 2309683; 753549, 2309805; 753423, 2309923; 753362, 2310023; 753362, 2310136; 753480, 2310171; 753589, 2310145; 753658, 2310188; 753754, 2310193; 753811, 2310162; 753863, 2310097; 754173, 2309970; 754408, 2309962; 754626, 2310066; 754713, 2310276; 754744, 2310446; 754796, 2310524; 754922, 2310572; return to starting point.

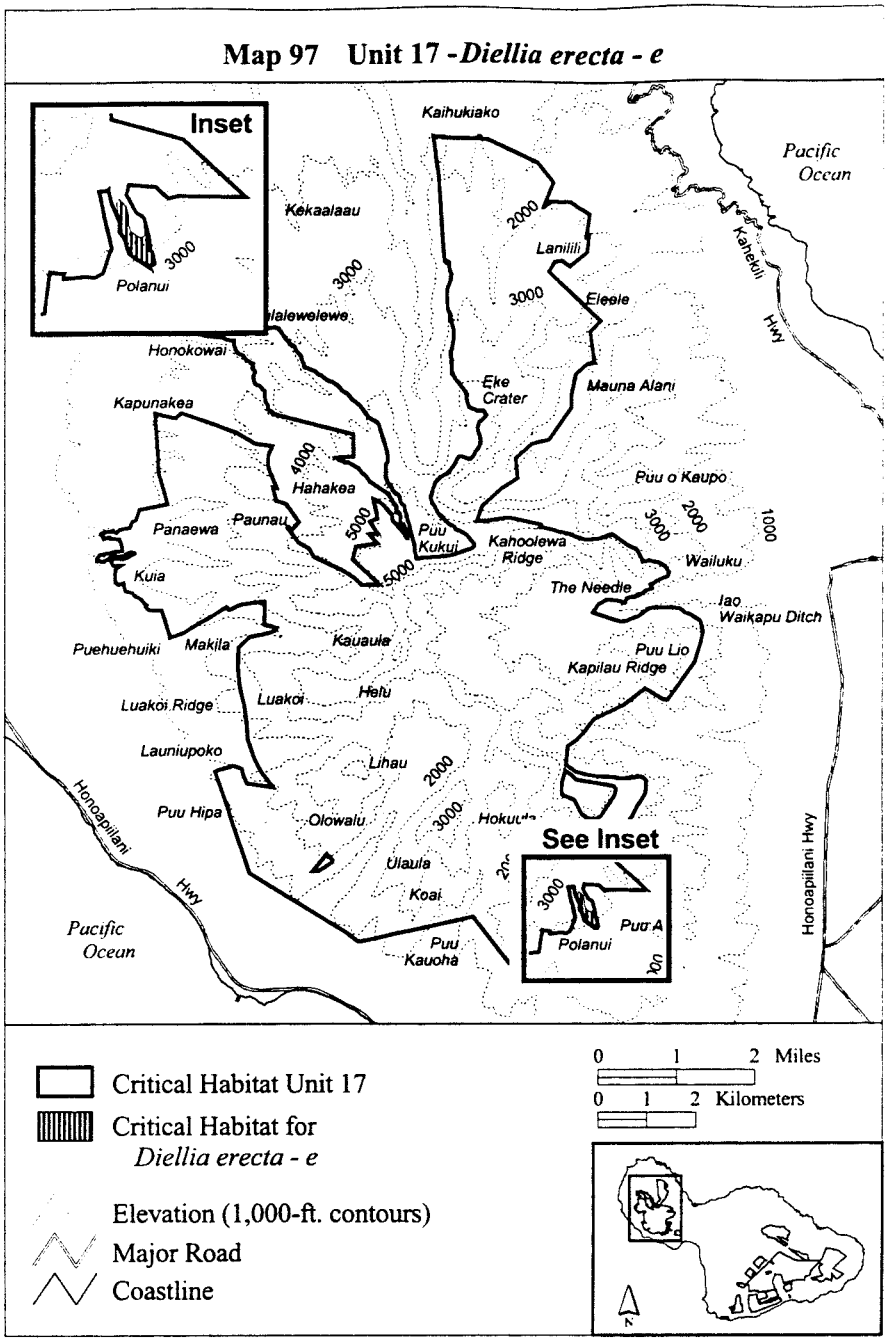
(B) **Note:** Map 96 follows:



(xcvii) Maui 17—*Diellia erecta*—e (12 ha; 29 ac).

(A) Unit consists of the following 29 boundary points: Start at 754760, 2304616; 754771, 2304529; 754782, 2304447; 754796, 2304431; 754826, 2304297; 754824, 2304296; 754782, 2304278; 754773, 2304280; 754723, 2304289; 754601, 2304370; 754538, 2304427; 754486, 2304579; 754443, 2304647; 754438, 2304725; 754437, 2304765; 754435, 2304770; 754432, 2304809; 754406, 2304960; 754432, 2305008; 754513, 2304931; 754542, 2304817; 754542, 2304724; 754561, 2304654; 754638, 2304599; 754693, 2304584; 754715, 2304617; 754708, 2304702; 754712, 2304743; 754722, 2304737; return to starting point.

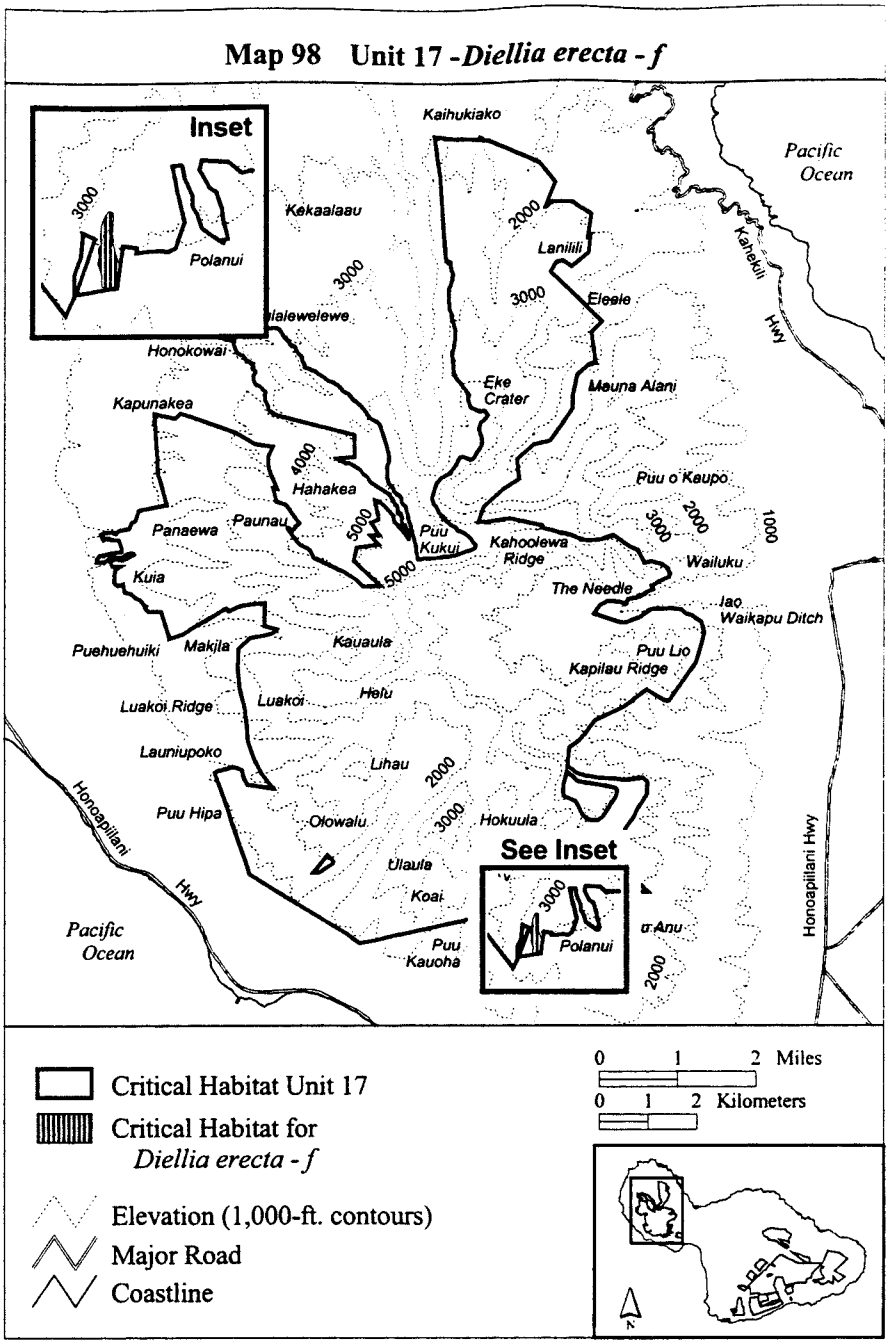
(B) **Note:** Map 97 follows:



(xcviii) Maui 17—*Diellia erecta*—f (14 ha; 34 ac).

(A) Unit consists of the following 26 boundary points: Start at 753632, 2303912; 753625, 2303862; 753619, 2303819; 753617, 2303805; 753606, 2303762; 753541, 2303750; 753534, 2303749; 753531, 2303748; 753440, 2303770; 753436, 2303843; 753444, 2303891; 753396, 2304028; 753410, 2304101; 753403, 2304190; 753429, 2304234; 753422, 2304323; 753436, 2304448; 753469, 2304533; 753517, 2304603; 753565, 2304584; 753569, 2304536; 753565, 2304407; 753558, 2304356; 753569, 2304289; 753565, 2304238; 753632, 2304017; return to starting point.

(B) **Note:** Map 98 follows:

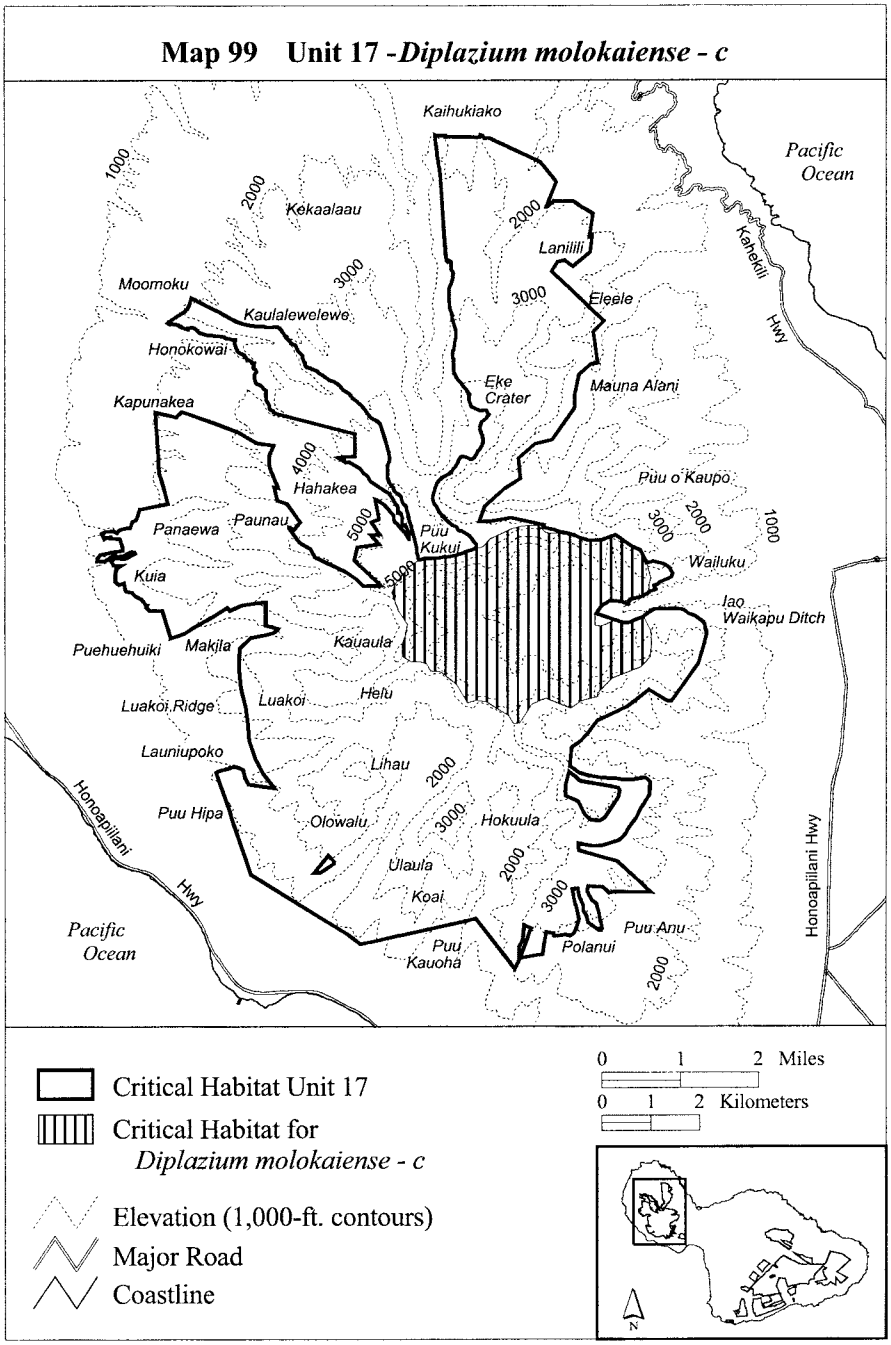


(xcix) Maui 17—*Diplazium molokaiense*—c (1,495 ha; 3,693 ac).

(A) Unit consists of the following 104 boundary points: Start at 754546, 2312287; 754606, 2312288; 754610, 2312288; 754834, 2312292; 755095, 2312393; 755436, 2312152; 755603, 2312078; 755737, 2311831; 755740, 2311819; 755830, 2311503; 755790, 2311369; 755790, 2311220; 755790, 2311209; 755633, 2311121; 755402, 2311063; 755230, 2311019; 754988, 2311042; 754931, 2311008; 754820, 2310941; 754711, 2310770; 754680, 2310721; 754687, 2310533; 754794, 2310520; 754921, 2310553; 755041, 2310620; 755269, 2310584; 755294, 2310580; 755295, 2310580; 755357, 2310584; 755364, 2310585; 755366, 2310585; 755395, 2310587; 755690, 2310701; 755823, 2310420; 755837, 2310132; 755810, 2309871; 755636, 2309671; 755034, 2309443; 754723, 2309107; 754733, 2309062; 754399, 2308969; 754265, 2308862; 754185, 2308821; 753679, 2309015; 753403, 2308902; 753162, 2308507; 753021, 2308494; 752921, 2308661; 752767, 2308768; 752647, 2308828; 752480, 2308948; 752259, 2308982; 752072, 2308935; 751858, 2309310; 751530, 2309577; 751323, 2309597; 751242, 2309744; 751129, 2309778; 750935, 2309778; 750741, 2309898; 750741, 2310145; 750801, 2310333; 750841, 2310553; 750661, 2310848; 750527, 2311202; 750607, 2311396; 750888, 2311744; 751101, 2311891; 751115, 2311894; 751125, 2311897; 751138, 2311901; 751197, 2311915; 751210, 2311916; 751252, 2311917; 751334, 2311913; 751353, 2311910; 751415, 2311923; 751428, 2311924; 751575, 2311921; 751719, 2311957; 751730, 2311960; 751766, 2311969; 751772, 2311971; 751845, 2311984; 751888,

2311992; 751889, 2311992; 751963, 2312014; 751997, 2312034; 752095, 2312064; 752096, 2312064; 752393, 2312158; 752547, 2312326; 752774, 2312419; 752975, 2312526; 753137, 2312560; 753296, 2312593; 753510, 2312586; 753690, 2312439; 753831, 2312419; 754009, 2312447; 754051, 2312453; 754245, 2312393; 754379, 2312336; 754499, 2312286; return to starting point.

(B) **Note:** Map 99 follows:

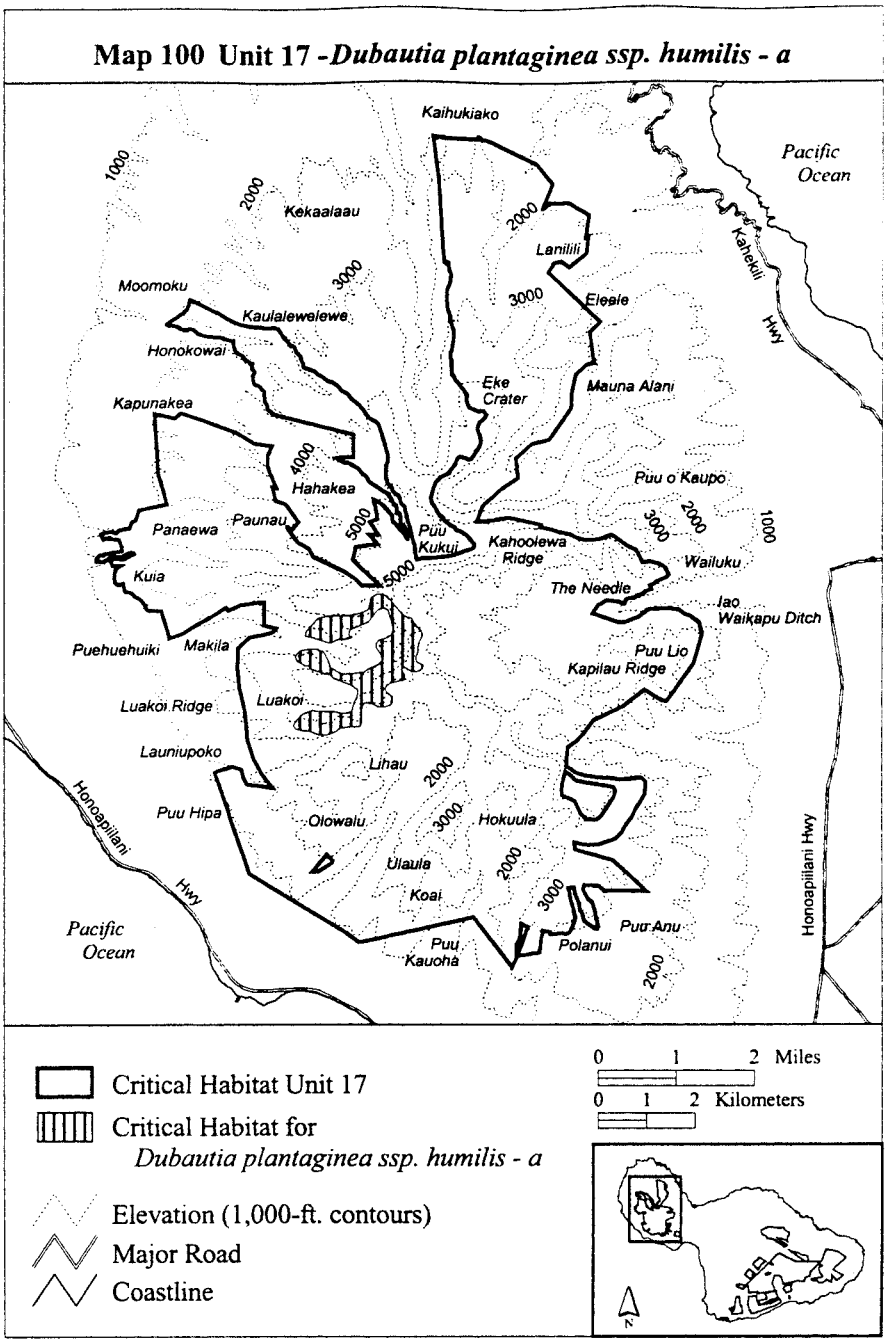


(c) Maui 17—*Dubautia plantaginea* ssp. *humilis*—a (293 ha; 723 ac).

(A) Unit consists of the following 125 boundary points: Start at 750756, 2309574; 750804, 2309536; 750834, 2309494; 750822, 2309406; 750716, 2309394; 750457, 2309300; 750422, 2309212; 750451, 2309153; 750581, 2309053; 750581, 2308953; 750557, 2308895; 750410, 2308848; 750298, 2308848; 750116, 2308936; 750004, 2308936; 749946, 2308818; 749940, 2308653; 749940, 2308495; 749916, 2308454; 749810, 2308430; 749722, 2308430; 749505, 2308412; 749410, 2308336; 749228, 2308271; 749058, 2308271; 748869, 2308348; 748681, 2308365; 748587, 2308383; 748528, 2308459; 748617, 2308589; 748711, 2308689; 748922, 2308783; 749016, 2308753; 749158, 2308753; 749352, 2308753; 749516, 2308712; 749652, 2308718; 749734, 2308753; 749804, 2308971; 749840, 2309042; 749860, 2309196; 749755, 2309277; 749635, 2309321; 749341, 2309445; 749279, 2309518; 749193, 2309518; 748880,

2309633; 748847, 2309691; 748794, 2309691; 748592, 2309801; 748577, 2309878; 748659, 2309998; 748847, 2310041; 749020, 2310032; 749159, 2309974; 749231, 2309825; 749293, 2309657; 749447, 2309561; 749553, 2309522; 749735, 2309527; 749995, 2309570; 750105, 2309647; 750283, 2309719; 750360, 2309806; 750322, 2309931; 750230, 2310080; 750240, 2310137; 750298, 2310229; 750447, 2310267; 750548, 2310344; 750596, 2310459; 750524, 2310671; 750471, 2310849; 750389, 2310887; 750269, 2310849; 750077, 2310599; 749687, 2310426; 749673, 2310363; 749678, 2310306; 749711, 2310262; 749659, 2310238; 749466, 2310238; 749313, 2310157; 749106, 2310209; 748952, 2310267; 748779, 2310301; 748799, 2310402; 749039, 2310671; 749245, 2310728; 749495, 2310724; 749639, 2310728; 749841, 2310757; 750048, 2310820; 750077, 2310863; 750120, 2311094; 750274, 2311175; 750432, 2311146; 750466, 2311103; 750557, 2311031; 750610, 2310949; 750663, 2310887; 750716, 2310805; 750845, 2310709; 750956, 2310680; 751009, 2310589; 751042, 2310536; 751124, 2310459; 751172, 2310407; 751182, 2310320; 751163, 2310248; 751124, 2310176; 751105, 2310075; 751095, 2309974; 751066, 2309888; 751057, 2309811; 751081, 2309767; 751143, 2309739; 751211, 2309700; 751196, 2309643; 751163, 2309614; 751095, 2309580; 750990, 2309566; 750927, 2309604; 750831, 2309652; 750778, 2309652; return to starting point.

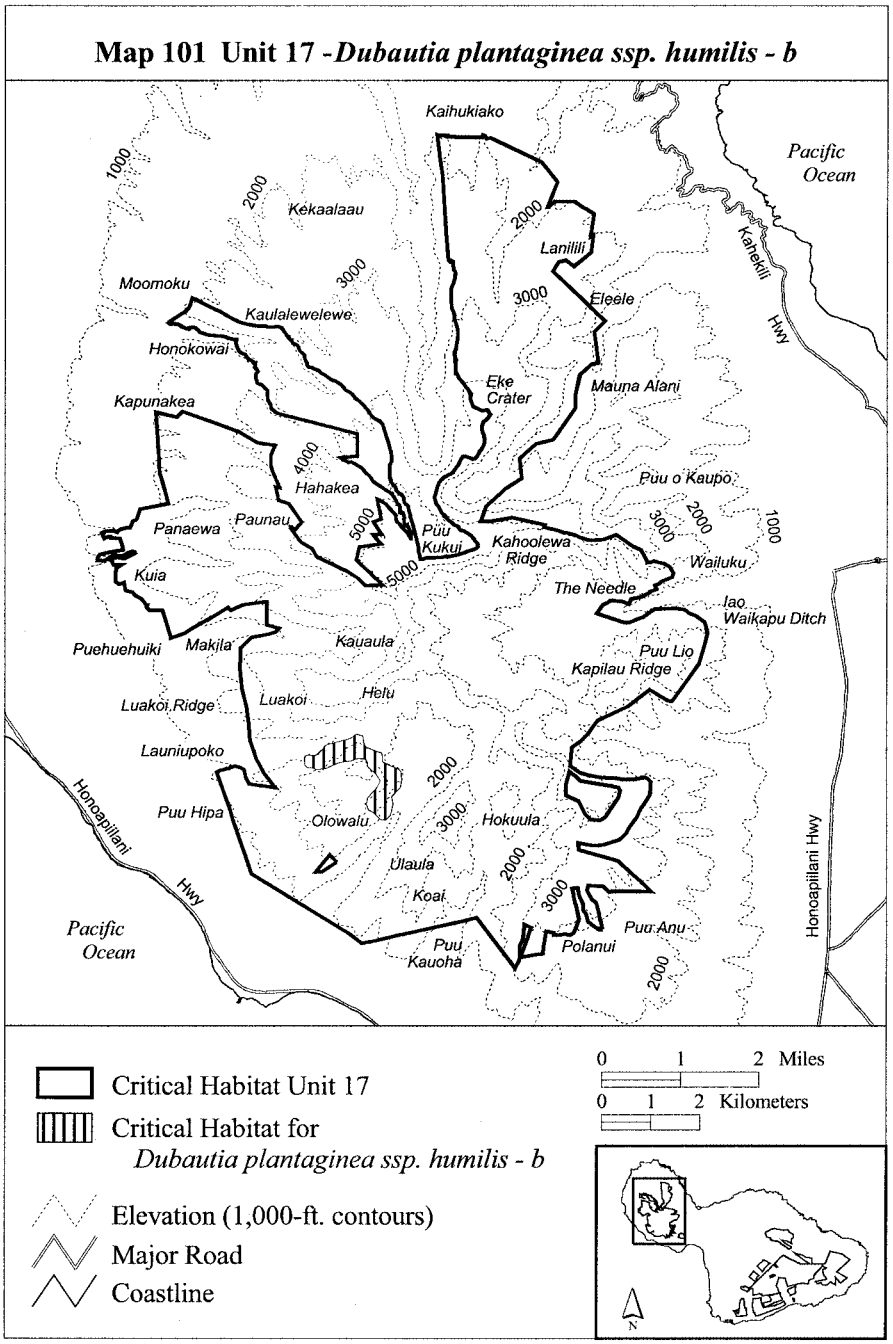
(B) **Note:** Map 100 follows:



(ci) Maui 17—*Dubautia plantaginea* ssp. *humilis*—b (114 ha; 283 ac).

(A) Unit consists of the following 42 boundary points: Start at 748770, 2307854; 748911, 2307842; 749022, 2307918; 749146, 2308060; 749652, 2308195; 749769, 2308283; 749887, 2308248; 749916, 2308101; 749969, 2308007; 750287, 2307895; 750298, 2307813; 750304, 2307713; 750457, 2307630; 750628, 2307566; 750681, 2307507; 750698, 2307336; 750669, 2307178; 750492, 2306983; 750510, 2306836; 750463, 2306601; 750363, 2306507; 750263, 2306519; 750146, 2306648; 750010, 2306719; 749963, 2306831; 749999, 2306960; 750198, 2307195; 750257, 2307325; 750157, 2307466; 749987, 2307619; 749993, 2307666; 749975, 2307748; 749904, 2307771; 749775, 2307771; 749646, 2307724; 749428, 2307695; 749146, 2307571; 748964, 2307542; 748834, 2307583; 748758, 2307583; 748699, 2307654; 748705, 2307830; return to starting point.

(B) **Note:** Map 101 follows:

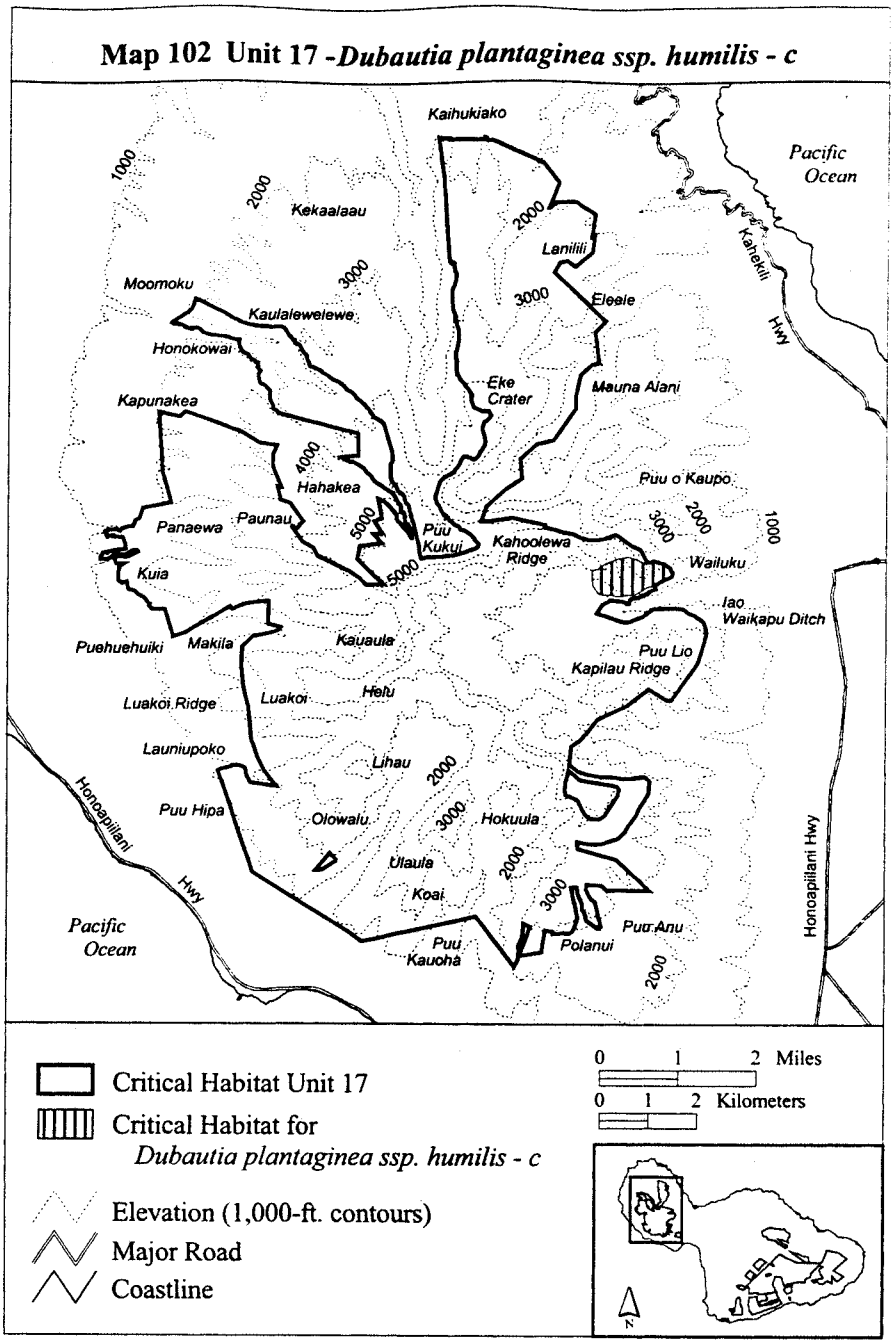


(cii) Maui 17—*Dubautia plantaginea* ssp. *humilis*—c (95 ha; 234 ac).

(A) Unit consists of the following 38 boundary points: Start at 755740, 2311819; 755809, 2311825; 755868, 2311853; 756001, 2311820; 756000, 2311819; 756067, 2311803; 756113, 2311777; 756198, 2311730; 756271, 2311594; 756244, 2311522; 756130, 2311477; 756013, 2311418; 755972, 2311382; 755885, 2311350; 755759, 2311305; 755487, 2311142; 755383,

2311142; 755306, 2311137; 755211, 2311119; 755098, 2311119; 755016, 2311160; 754948, 2311155; 754917, 2311105; 754908, 2311137; 754808, 2311160; 754713, 2311191; 754627, 2311327; 754627, 2311336; 754604, 2311481; 754604, 2311617; 754627, 2311667; 754740, 2311690; 754754, 2311721; 754971, 2311830; 755143, 2311893; 755356, 2311925; 755537, 2311875; 755664, 2311812; return to starting point.

(B) **Note:** Map 102 follows:

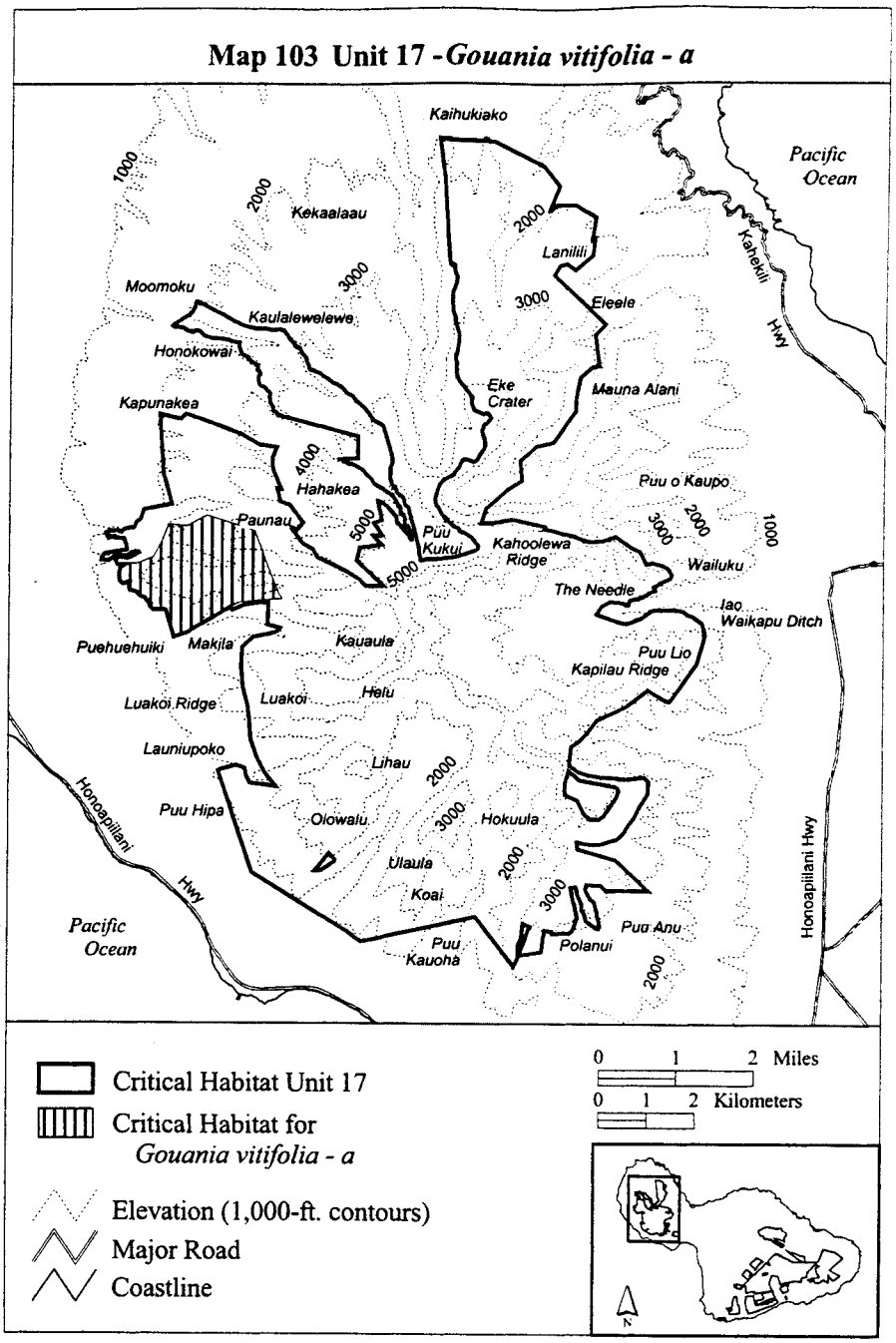


(ciii) Maui 17—*Gouania vitifolia*—a (485 ha; 1,198 ac).

(A) Unit consists of the following 41 boundary points: Start at 747141, 2310897; 746995, 2310813; 746754, 2310674; 746408, 2310474; 746263, 2310363; 745972, 2310265; 745966, 2310304; 745798, 2310840; 745541, 2310836; 745477, 2310914; 745480, 2310933; 745471, 2310939; 745465, 2310964; 745411, 2311024; 745368, 2311075; 745241, 2311145; 745197, 2311199; 745057, 2311247; 745052, 2311257; 745043, 2311276; 745010, 2311405; 744912, 2311365; 744842, 2311439; 744842, 2311486; 744842, 2311603; 744848, 2311671; 744847, 2311673; 744850, 2311702; 744959, 2311780; 744998, 2311808; 745212, 2311808; 745549, 2311923; 745721, 2312269; 745854, 2312631; 746251, 2312595; 746652, 2312824; 747641, 2312506; 747841, 2311974; 748141,

2311198; 748215, 2311076; 747319, 2311000; return to starting point.

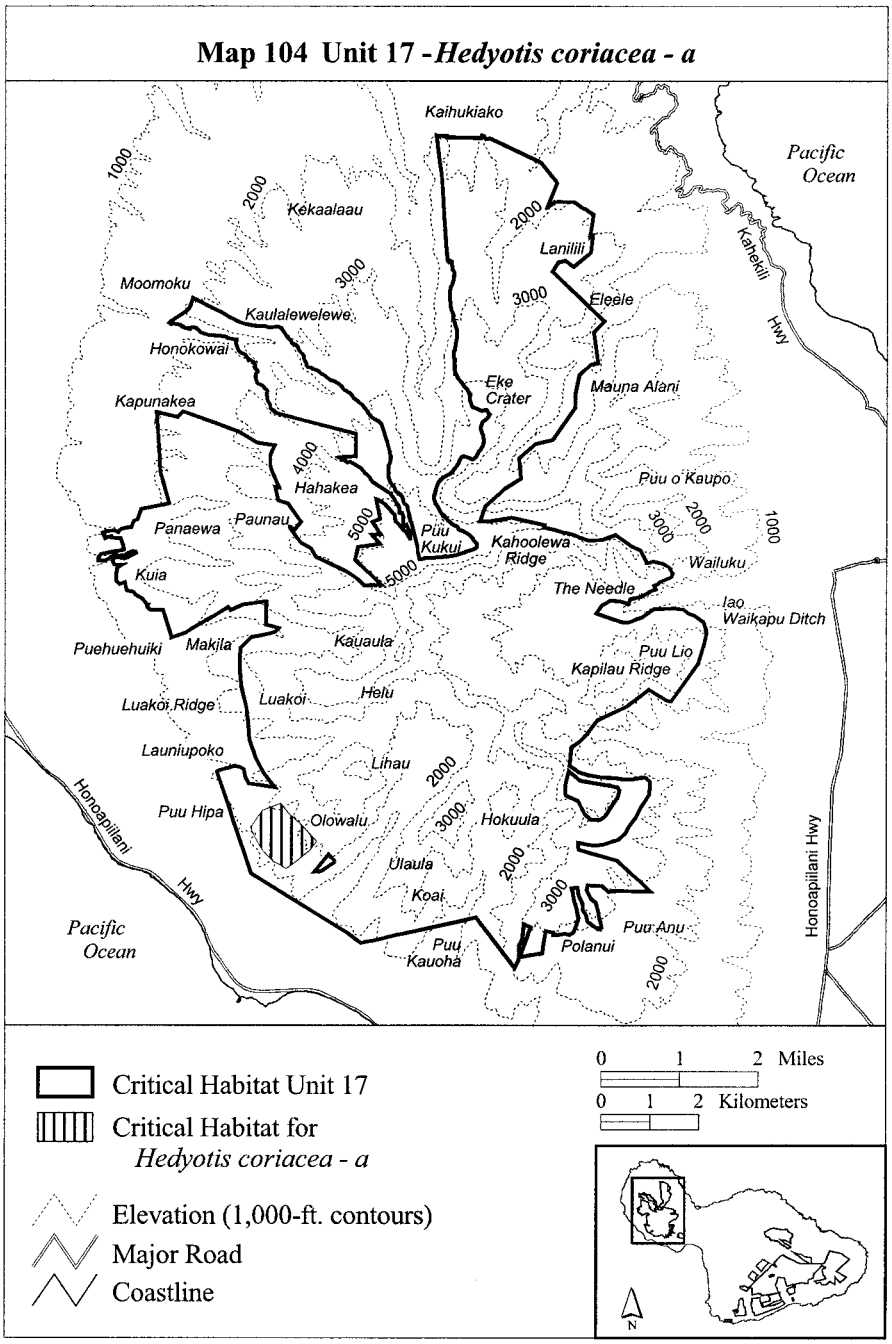
(B) **Note:** Map 103 follows:



(civ) Maui 17—*Hedyotis coriacea*—a (106 ha; 262 ac).

(A) Unit consists of the following 17 boundary points: Start at 748229, 2306846; 748395, 2306645; 748650, 2306411; 748979, 2306067; 748838, 2305871; 748820, 2305865; 748469, 2305574; 748339, 2305505; 748218, 2305574; 748077, 2305651; 747887, 2305845; 747810, 2305946; 747709, 2306127; 747636, 2306281; 747610, 2306361; 747634, 2306377; 747850, 2306700; return to starting point.

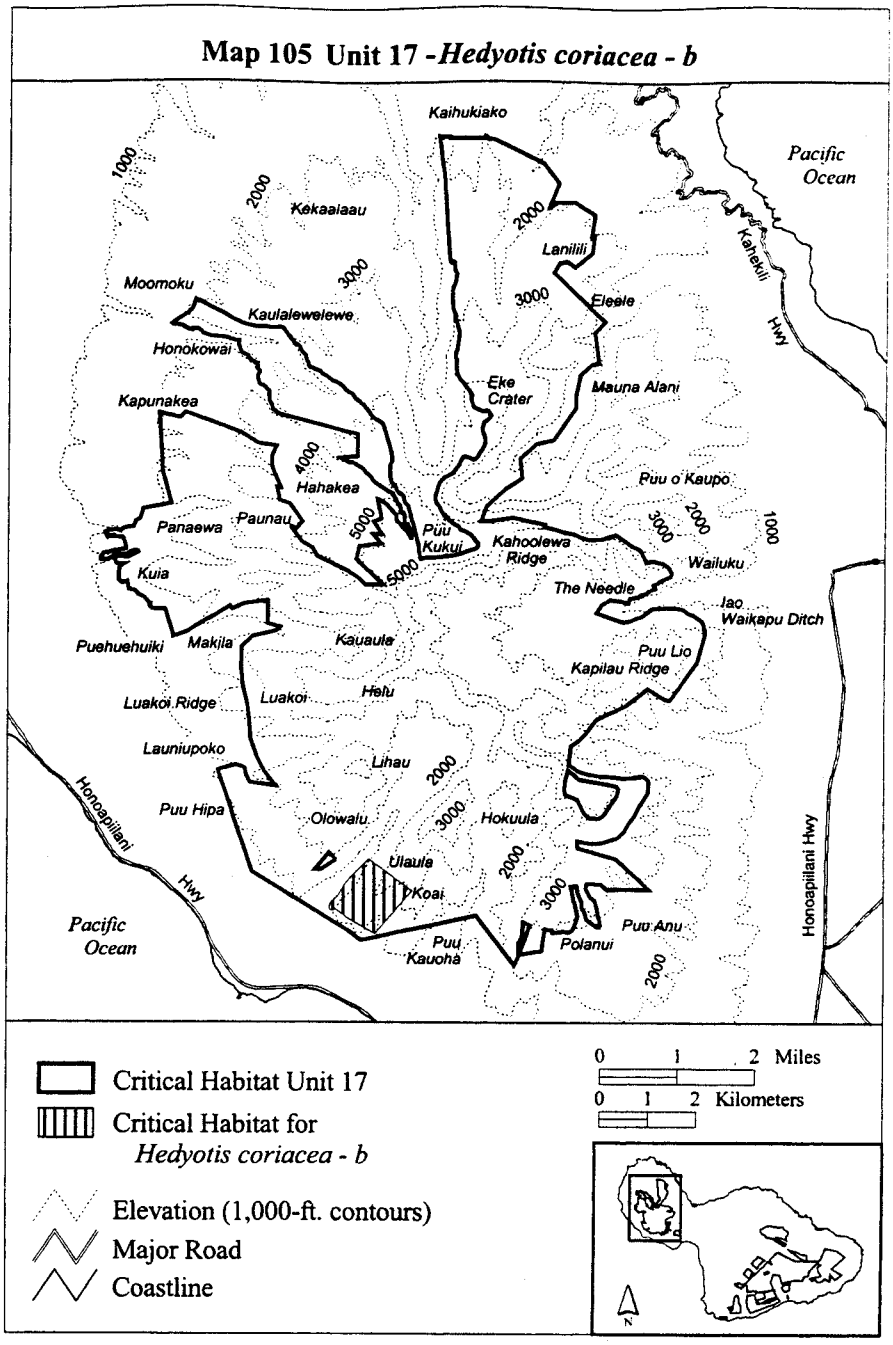
(B) **Note:** Map 104 follows:



(cv) Maui 17—*Hedyotis coriacea*—b (138 ha; 340 ac).

(A) Unit consists of the following 15 boundary points: Start at 750175, 2304106; 750114, 2304143; 749603, 2304436; 749378, 2304612; 749292, 2304605; 749240, 2304605; 749225, 2304642; 749247, 2304740; 749311, 2304807; 749416, 2304901; 749540, 2305122; 749716, 2305336; 749855, 2305464; 750041, 2305656; 750931, 2304991; return to starting point.

(B) **Note:** Map 105 follows:

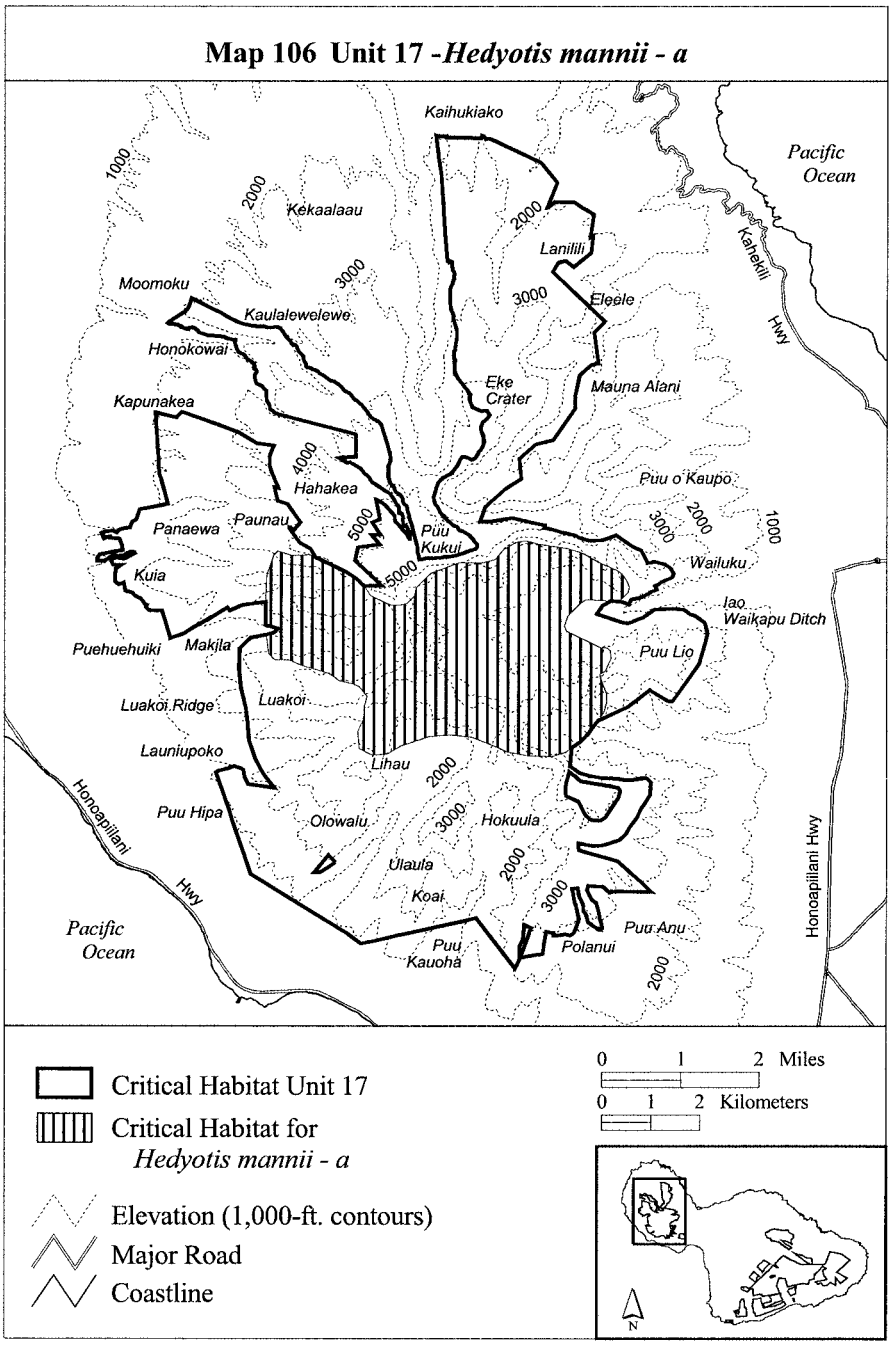


(cvi) Maui 17—*Hedyotis mannii*—a (2,234 ha; 5,521 ac).

(A) Unit consists of the following 91 boundary points: Start at 754727, 2308566; 754627, 2308441; 754539, 2308313; 754379, 2308137; 754206, 2308013; 754067, 2307913; 753787, 2307825; 753291, 2307841; 752907, 2307913; 752547, 2308073; 752153, 2308222; 751739, 2308265; 751304, 2308250; 750705, 2308040; 750420, 2307876; 750121, 2307846; 749836, 2307996; 749821, 2308340; 749939, 2308602; 749944, 2308823; 750001, 2309070; 749859, 2309265; 749711, 2309330; 749709, 2309329; 749451, 2309383; 749360, 2309453; 749225, 2309542; 748982, 2309613; 748668, 2309703; 748413, 2309823; 748114, 2309823; 747994, 2309943; 747935, 2310342; 747935, 2310343; 748094, 2310374; 748180, 2310466; 747930, 2310531; 747921, 2311010; 747919, 2311126; 747942, 2311477; 747949, 2311590; 748084, 2311980; 748174, 2312070; 748443, 2311980; 748833, 2311995; 748934, 2311945; 749571, 2311633; 749803, 2311489; 749939, 2311346; 749971, 2311313; 750085, 2311145; 750491, 2310953; 750699, 2310953; 750827, 2310993; 750971, 2311129; 750974, 2311127; 751010, 2311307; 751322, 2311611; 751900, 2311832; 752386, 2311832; 752622, 2311893; 752820, 2312105; 753056, 2312250; 753254, 2312280; 753543, 2312212; 754098, 2312113; 754402, 2312029; 754775, 2311832; 755109, 2311680; 755208, 2311596; 755307, 2311467; 755368, 2311315; 755337, 2311208; 755201, 2311071; 754934, 2311041; 754496, 2311070; 754383, 2311003; 754117, 2310737; 754049, 2310524; 754079, 2310418; 754794, 2310076; 754904, 2310075; 754980, 2310014; 754995, 2309839; 754919, 2309679; 754889, 2309596; 754767, 2309514; 754827, 2309305; 754907,

2309113; 754907, 2308945; 754851, 2308721; return to starting point.

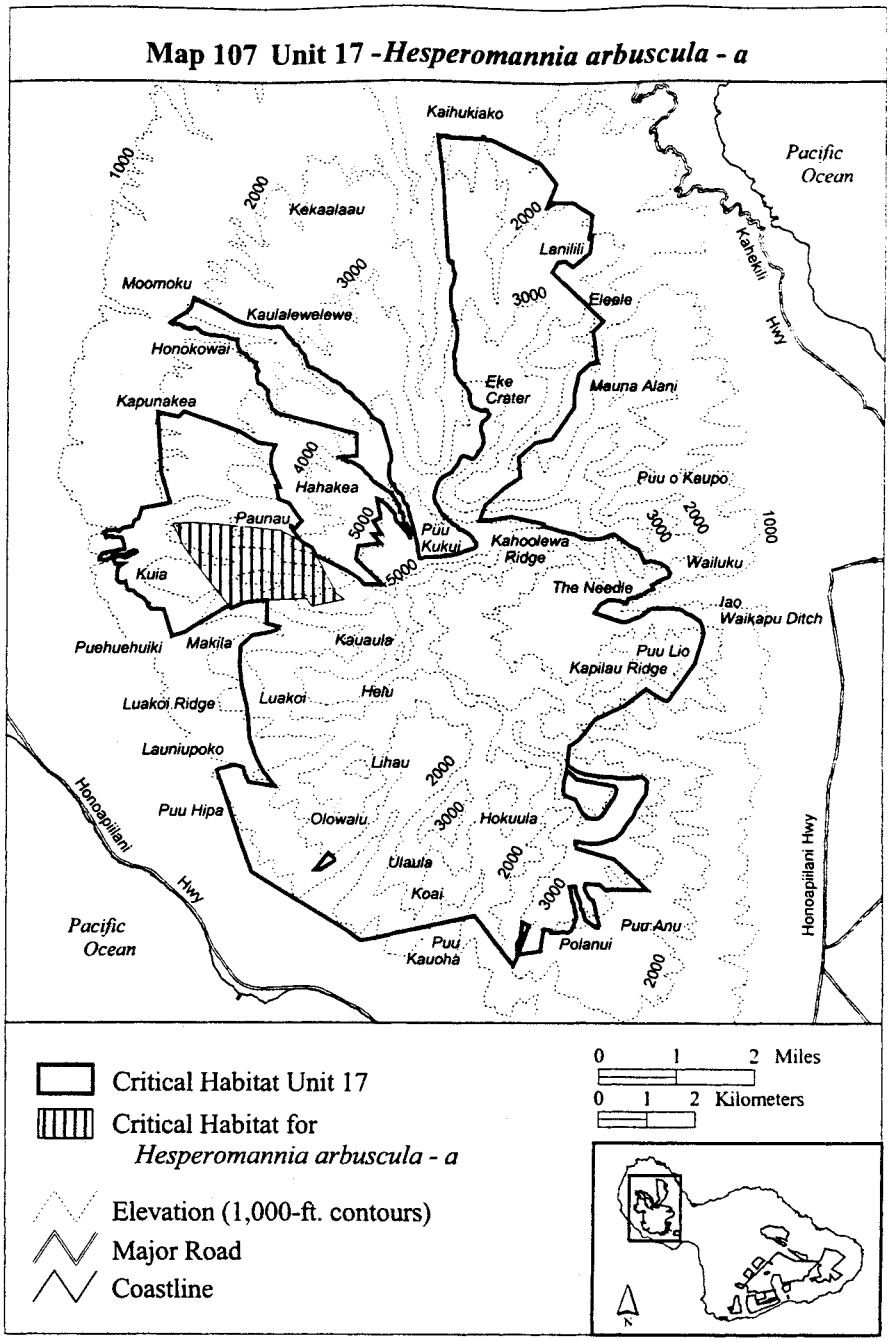
(B) **Note:** Map 106 follows:



(cvii) Maui 17—*Hesperomannia arbuscula*—a (392 ha; 968 ac).

(A) Unit consists of the following 19 boundary points: Start at 747921, 2311010; 747903, 2311009; 747525, 2310992; 747443, 2310953; 747190, 2310834; 747141, 2310897; 746634, 2311554; 746203, 2312157; 745979, 2312604; 746368, 2312645; 748186, 2312479; 748631, 2312228; 748848, 2312105; 748934, 2311945; 749268, 2311327; 749365, 2311159; 749509, 2311034; 748847, 2310882; 748737, 2311047; return to starting point.

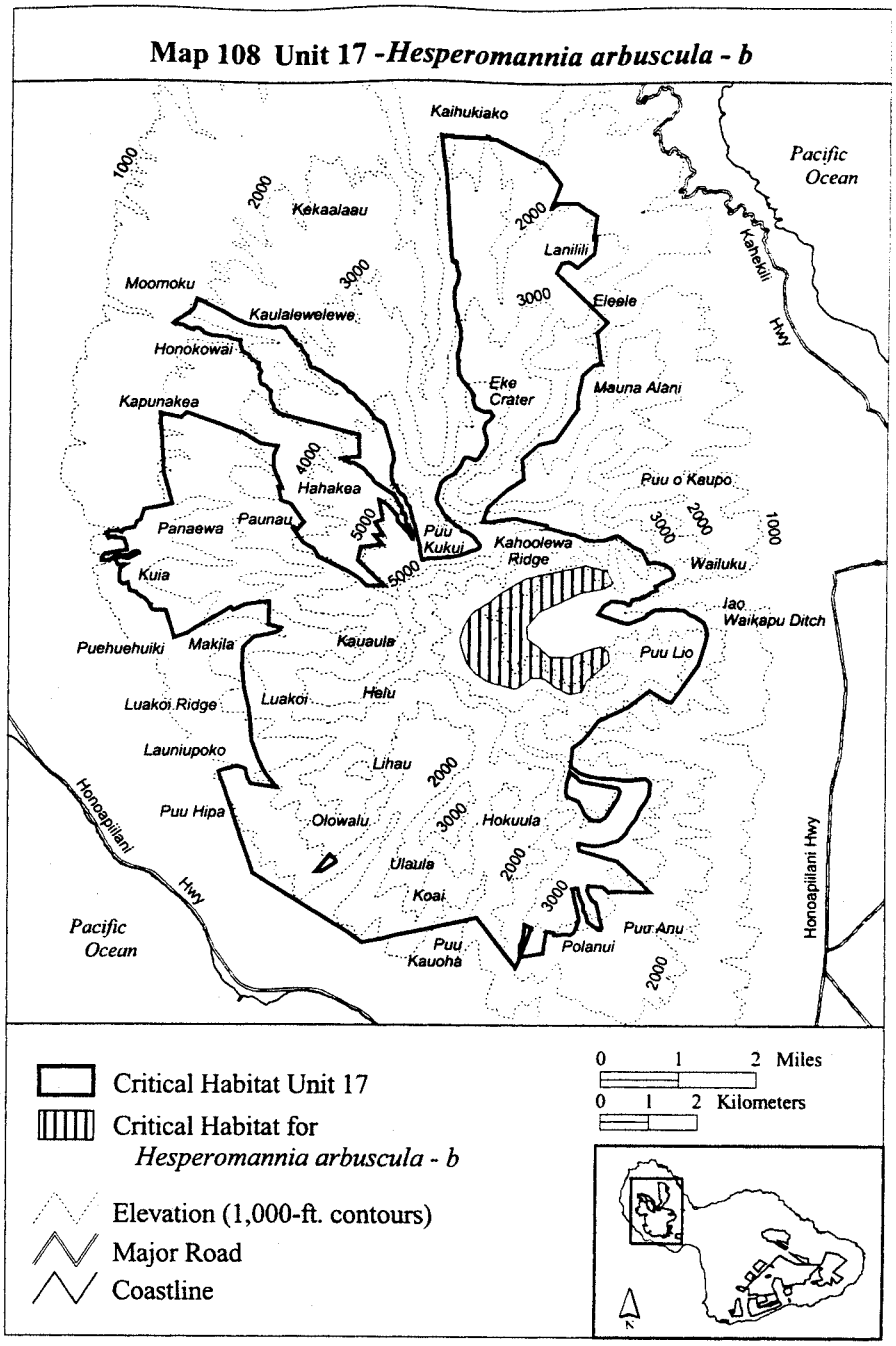
(B) **Note:** Map 107 follows:



(cviii) Maui 17—*Hesperomannia arbuscula*—b (435 ha; 1,076 ac).

(A) Unit consists of the following 36 boundary points: Start at 752168, 2310821; 752476, 2311020; 752645, 2311166; 753026, 2311401; 753239, 2311511; 754450, 2311761; 754890, 2311665; 755015, 2311408; 754831, 2311291; 754347, 2311203; 753481, 2310799; 753232, 2310491; 753247, 2310271; 753459, 2310095; 753701, 2309890; 754112, 2309875; 754567, 2310044; 754773, 2310102; 754912, 2310014; 754949, 2309787; 754736, 2309611; 754479, 2309391; 754391, 2309156; 754142, 2309105; 753841, 2309244; 753599, 2309427; 753349, 2309449; 753078, 2309251; 752982, 2309229; 752461, 2309361; 752190, 2309530; 751999, 2309758; 751904, 2310058; 751860, 2310256; 751955, 2310528; 752087, 2310748; return to starting point.

(B) **Note:** Map 108 follows:

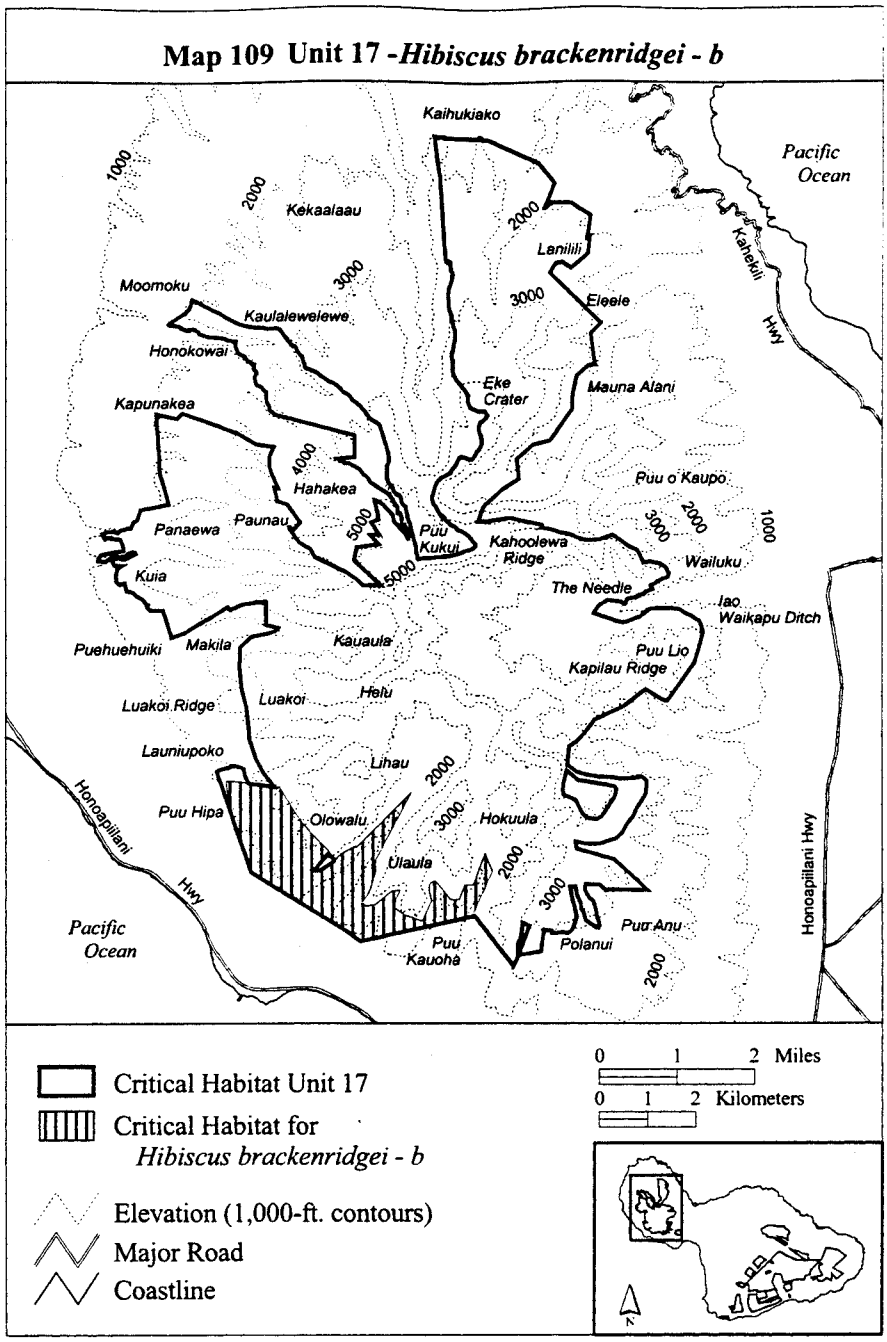


(cix) Maui 17—*Hibiscus brackenridgei*—b (672 ha; 1,661 ac).

(A) Unit consists of the following 60 boundary points: Start at 752075, 2304457; 752048, 2304451; 750687, 2304151; 750686, 2304151; 750403, 2304088; 749884, 2303974; 749722, 2304095; 749666, 2304138; 749584, 2304189; 748359, 2304949; 747620, 2305411; 747479, 2305820; 747343, 2306214; 747263, 2306446; 747200, 2306630; 747191, 2306692; 747101, 2307299; 747121, 2307299; 747120, 2307301; 747329, 2307289; 747571, 2307254; 748096, 2307179; 748214, 2307162; 748499, 2306705; 748671, 2306455; 749034, 2306050; 749215, 2305860; 749378, 2305670; 749491, 2305783; 749783, 2305937; 749811, 2305928; 750938, 2307038; 750193, 2305638; 750202, 2305598; 750197, 2305412; 750122, 2305158; 750027, 2304930; 749905, 2304760; 750011, 2304702; 750197, 2304744; 750446, 2304940; 750546, 2305015; 750695, 2305036; 750679, 2304967; 750621, 2304845; 750589, 2304670; 750818, 2304506; 751161, 2304400; 751352, 2304808; 751305, 2304993; 751305, 2305126; 751352, 2305195; 751442, 2305221; 751741, 2304837; 751924, 2304837; 752039, 2305135; 752222, 2305135; 752452, 2305777; 752612, 2305410; 752197, 2304484; return to starting point.

(B) Excluding the area bounded by the following 11 boundary points (6ha; 15ac): Start at 749362, 2305641; 749057, 2305433; 748930, 2305439; 749226, 2305793; 749363, 2305641; 749363, 2305641; 749363, 2305641; 749363, 2305641; 749363, 2305641; 749362, 2305640; return to starting point.

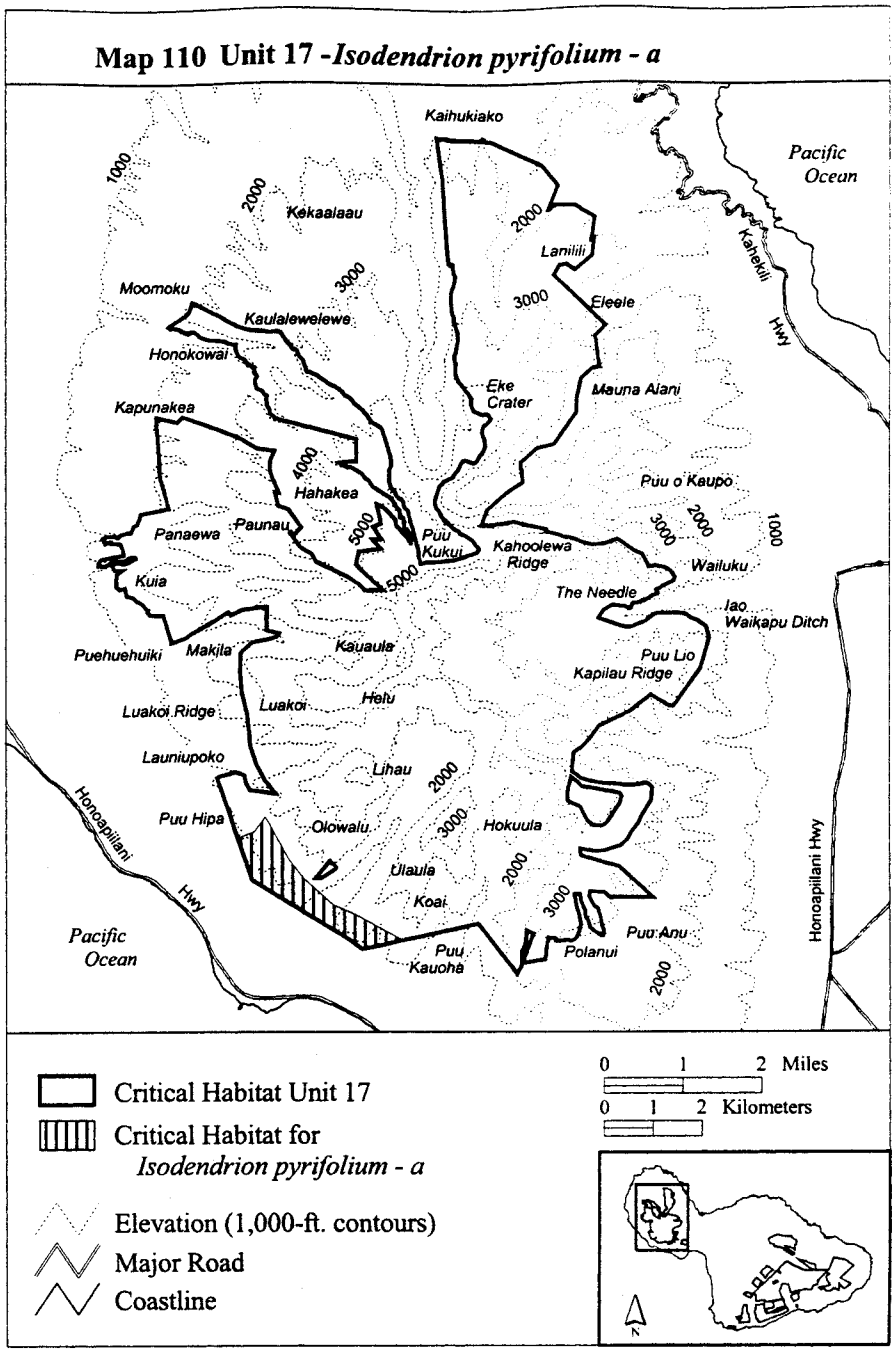
(C) **Note:** Map 109 follows:



(cx) Maui 17—*Isodendrion pyrifolium*—a (224 ha; 555 ac).

(A) Unit consists of the following 20 boundary points: Start at 750686, 2304151; 750460, 2304101; 750214, 2304047; 749928, 2303984; 749903, 2303978; 749898, 2303977; 749722, 2304095; 749584, 2304189; 749409, 2304307; 748359, 2304949; 747620, 2305407; 747479, 2305820; 747331, 2306254; 747670, 2306395; 747898, 2306699; 748388, 2305794; 748679, 2305440; 749287, 2304896; 749758, 2304696; 750700, 2304154; return to starting point.

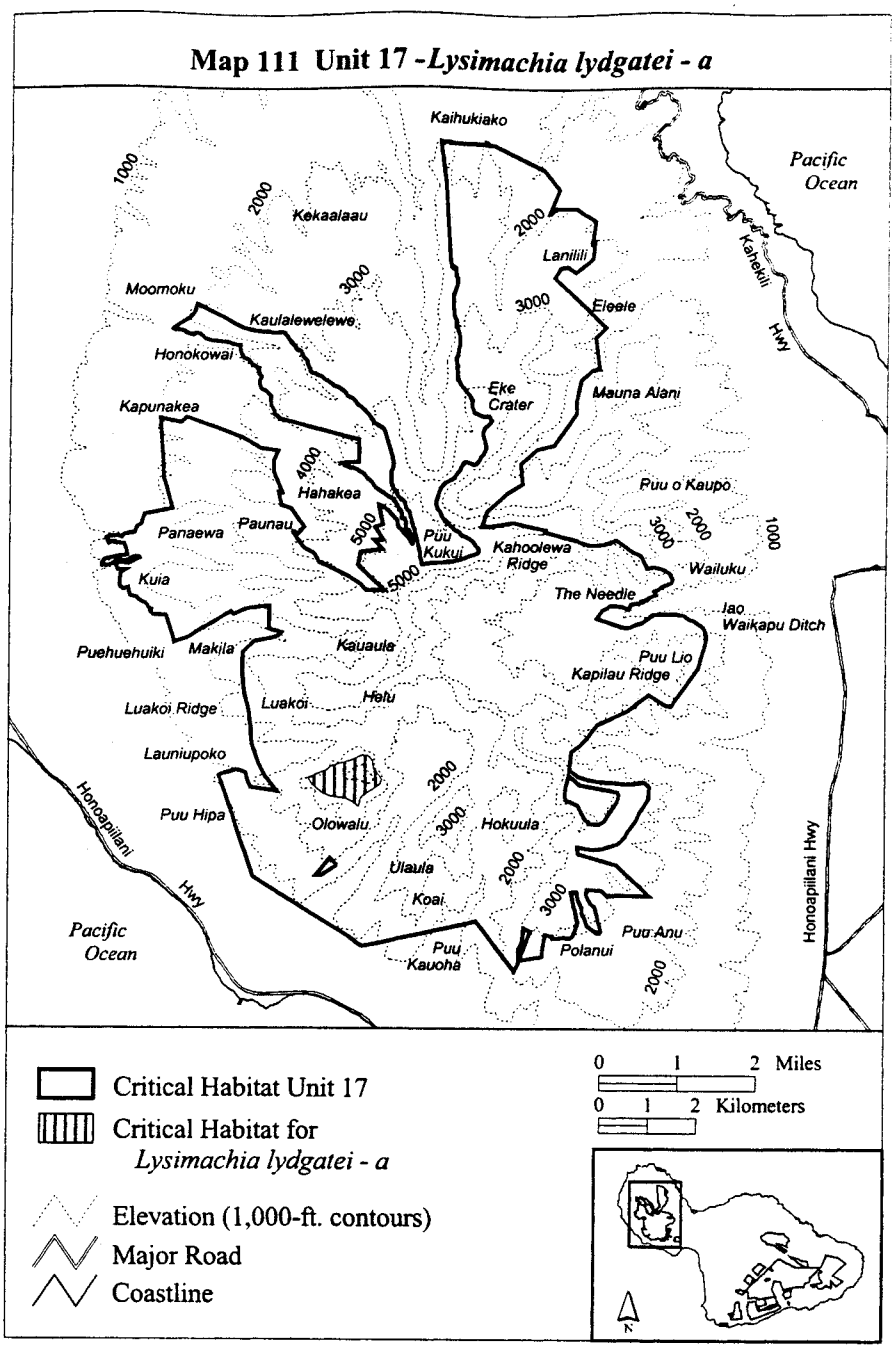
(B) **Note:** Map 110 follows:



(cxi) Maui 17—*Lysimachia lydgatei*—a (89 ha; 221 ac).

(A) Unit consists of the following 28 boundary points: Start at 748761, 2307434; 748761, 2307462; 748898, 2307517; 749159, 2307627; 749233, 2307705; 749329, 2307723; 749389, 2307755; 749654, 2307824; 749737, 2307865; 749879, 2307929; 750007, 2307916; 750080, 2307833; 750099, 2307732; 750103, 2307664; 750186, 2307558; 750273, 2307434; 750250, 2307334; 750076, 2307201; 749911, 2307100; 749842, 2307040; 749801, 2306857; 749663, 2306972; 749549, 2307022; 749480, 2307040; 749242, 2307059; 749086, 2307127; 748830, 2307334; 748761, 2307421; return to starting point.

(B) **Note:** Map 111 follows:



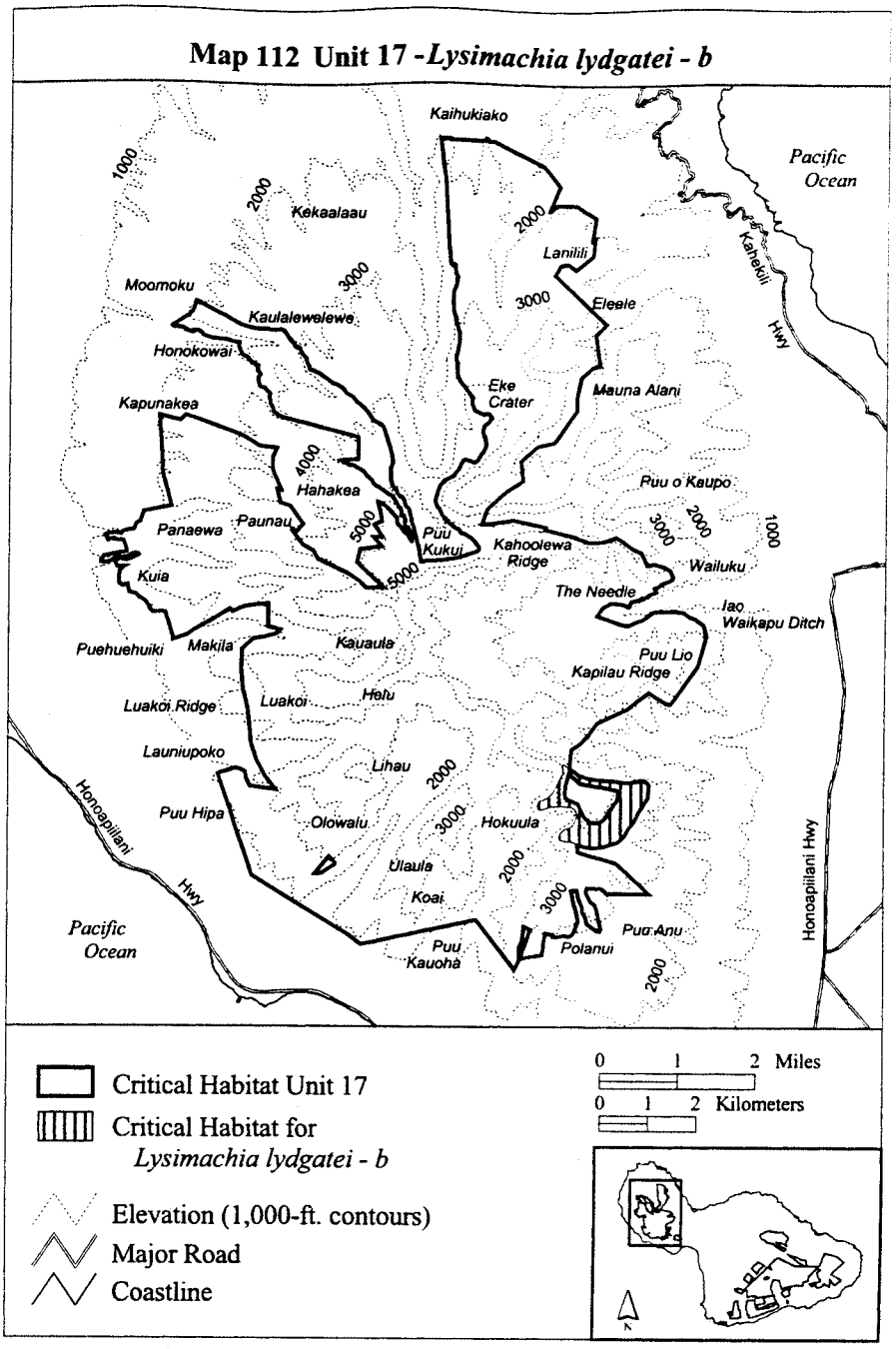
(cxii) Maui 17—*Lysimachia lydgatei*—b (220 ha; 544 ac).

(A) Unit consists of the following 67 boundary points: Start at 754164, 2307624; 754188, 2307607; 754367, 2307487; 754541, 2307436; 754599, 2307426; 754834, 2307383; 755113, 2307365; 755261, 2307345; 755428, 2307345; 755624, 2307370; 755652, 2307375; 755657, 2307376; 755704, 2307385; 755734, 2307365; 755806, 2307294; 755803, 2307069; 755794, 2307046; 755803, 2307043; 755697, 2306874; 755624, 2306756; 755515, 2306552; 755490, 2306519; 755377, 2306367; 755334, 2306276; 755319, 2306243; 755262, 2306193; 755163, 2306105; 755088, 2306079; 755078, 2306075; 754935, 2306024; 754857, 2305996; 754748, 2305990; 754614, 2305982; 754412, 2306019; 754341, 2306032; 754341, 2306031; 754336, 2306037; 754319, 2306054; 754254, 2306105; 754083, 2306112; 753970, 2306152; 753941, 2306203; 753985, 2306280; 754050, 2306349; 754192, 2306403; 754247, 2306469; 754327, 2306603; 754312, 2306694; 754272, 2306781; 754214, 2306829; 753999, 2306850; 753861, 2306832; 753774, 2306836; 753618, 2306774; 753523, 2306770; 753494, 2306847; 753541, 2306949; 753640, 2306978; 753730, 2307025; 753825, 2307130; 753890, 2307243; 753940, 2307388; 754036, 2307519; 754021, 2307625; 754007, 2307650; 754021, 2307697; 754054, 2307701; return to starting point.

(B) Excluding the area bounded by the following 19 boundary points (62ha; 153ac): Start at 754495, 2306605; 754472, 2306625; 754334, 2306901; 754090, 2307018; 754065, 2307098; 754087, 2307266; 754141, 2307512; 754162, 2307496; 754243, 2307436;

754381, 2307316; 755039, 2307210; 755145, 2307181; 755188, 2307116; 755155, 2306981; 755028, 2306781; 754890, 2306567; 754808, 2306523; 754788, 2306512; 754588, 2306523; return to starting point.

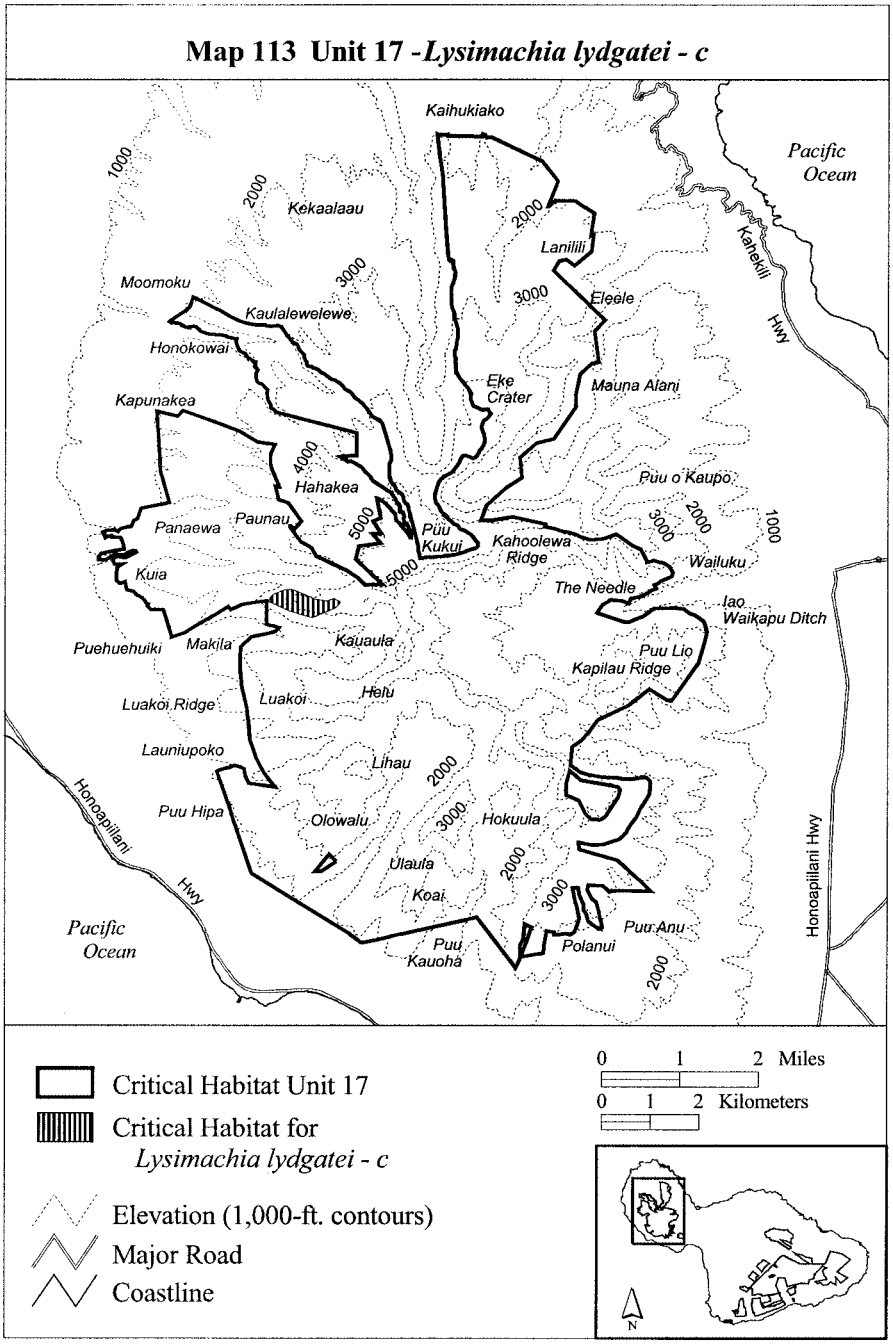
(C) **Note:** Map 112 follows:



(cxiii) Maui 17—*Lysimachia lydgatei*—c (47 ha; 117 ac).

(A) Unit consists of the following 18 boundary points: Start at 748746, 2311133; 748917, 2311048; 749167, 2311011; 749305, 2311059; 749438, 2311006; 749422, 2310952; 749353, 2310873; 749060, 2310745; 748858, 2310670; 748624, 2310729; 748411, 2310793; 748135, 2310920; 747970, 2311000; 747997, 2311080; 748066, 2311154; 748289, 2311240; 748433, 2311255; 748512, 2311234; return to starting point.

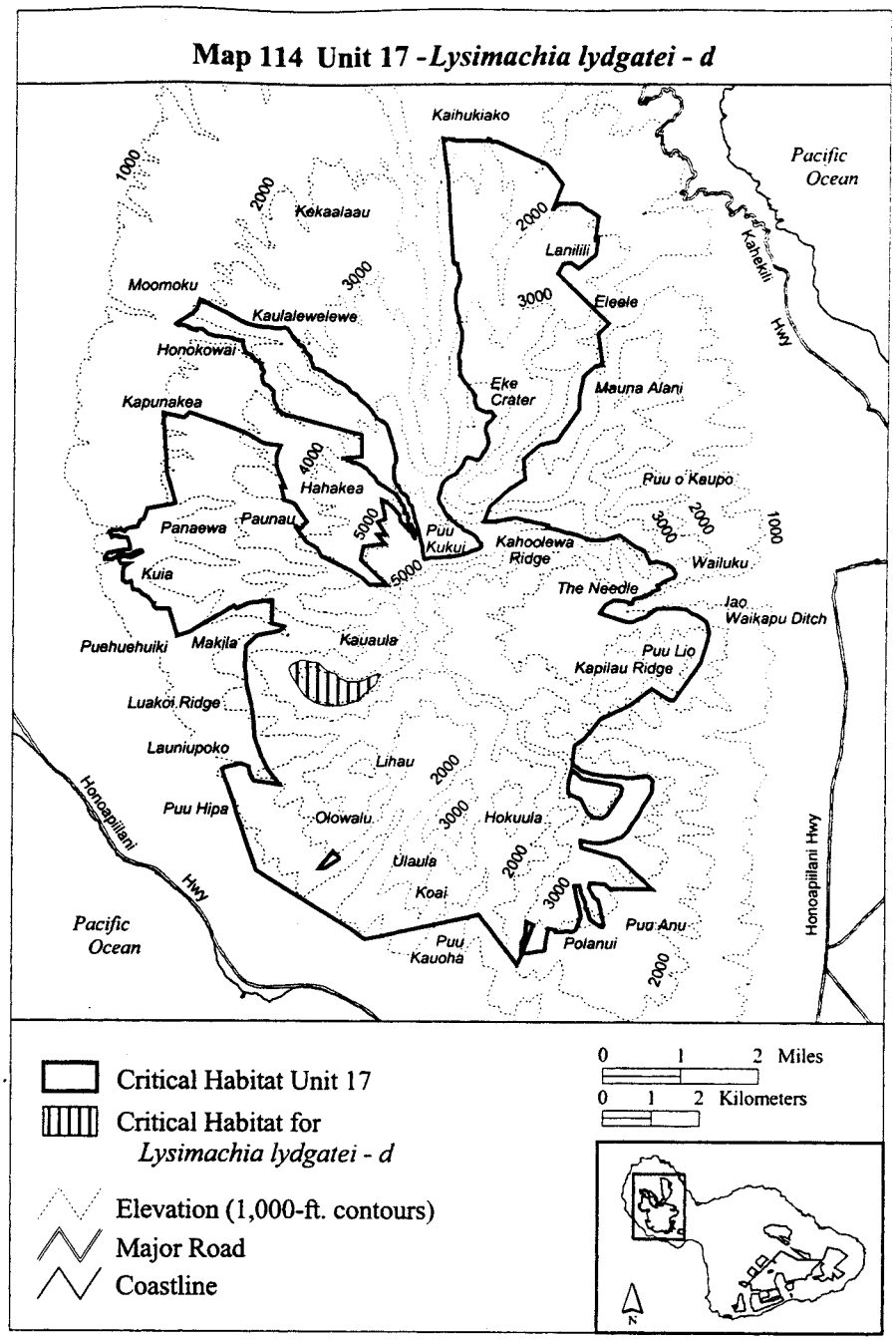
(B) **Note:** Map 113 follows:



(cxiv) Maui 17—*Lysimachia lydgatei*—d (98 ha; 241 ac).

(A) Unit consists of the following 30 boundary points: Start at 750135, 2309496; 750181, 2309483; 750177, 2309446; 750122, 2309373; 750090, 2309281; 749925, 2309130; 749801, 2309038; 749773, 2308951; 749416, 2308836; 749077, 2308814; 748834, 2308882; 748623, 2309020; 748486, 2309217; 748335, 2309450; 748293, 2309574; 748321, 2309638; 748385, 2309698; 748523, 2309757; 748582, 2309771; 748738, 2309734; 748885, 2309721; 748999, 2309606; 749123, 2309519; 749251, 2309487; 749329, 2309405; 749498, 2309322; 749682, 2309322; 749842, 2309350; 749906, 2309400; 750025, 2309450; return to starting point.

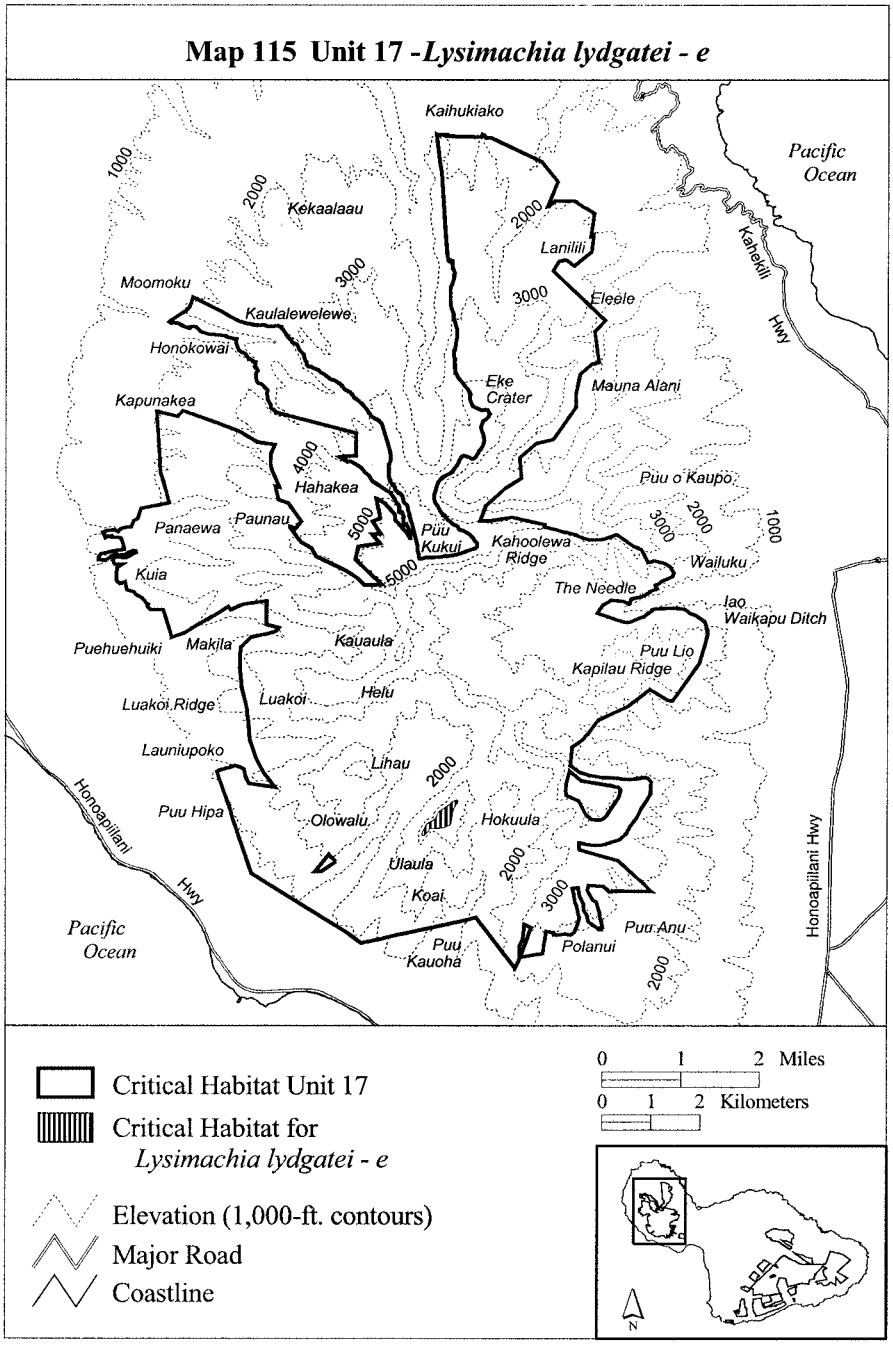
(B) **Note:** Map 114 follows:



(cxv) Maui 17—*Lysimachia lydgatei*—e (18 ha; 44 ac).

(A) Unit consists of the following 22 boundary points: Start at 751408, 2306523; 751429, 2306563; 751478, 2306669; 751724, 2306831; 751767, 2306892; 751846, 2306916; 751871, 2306886; 751843, 2306831; 751785, 2306736; 751755, 2306654; 751746, 2306529; 751718, 2306404; 751575, 2306347; 751374, 2306334; 751307, 2306322; 751264, 2306246; 751164, 2306182; 751133, 2306194; 751136, 2306234; 751188, 2306328; 751240, 2306423; 751359, 2306493; return to starting point.

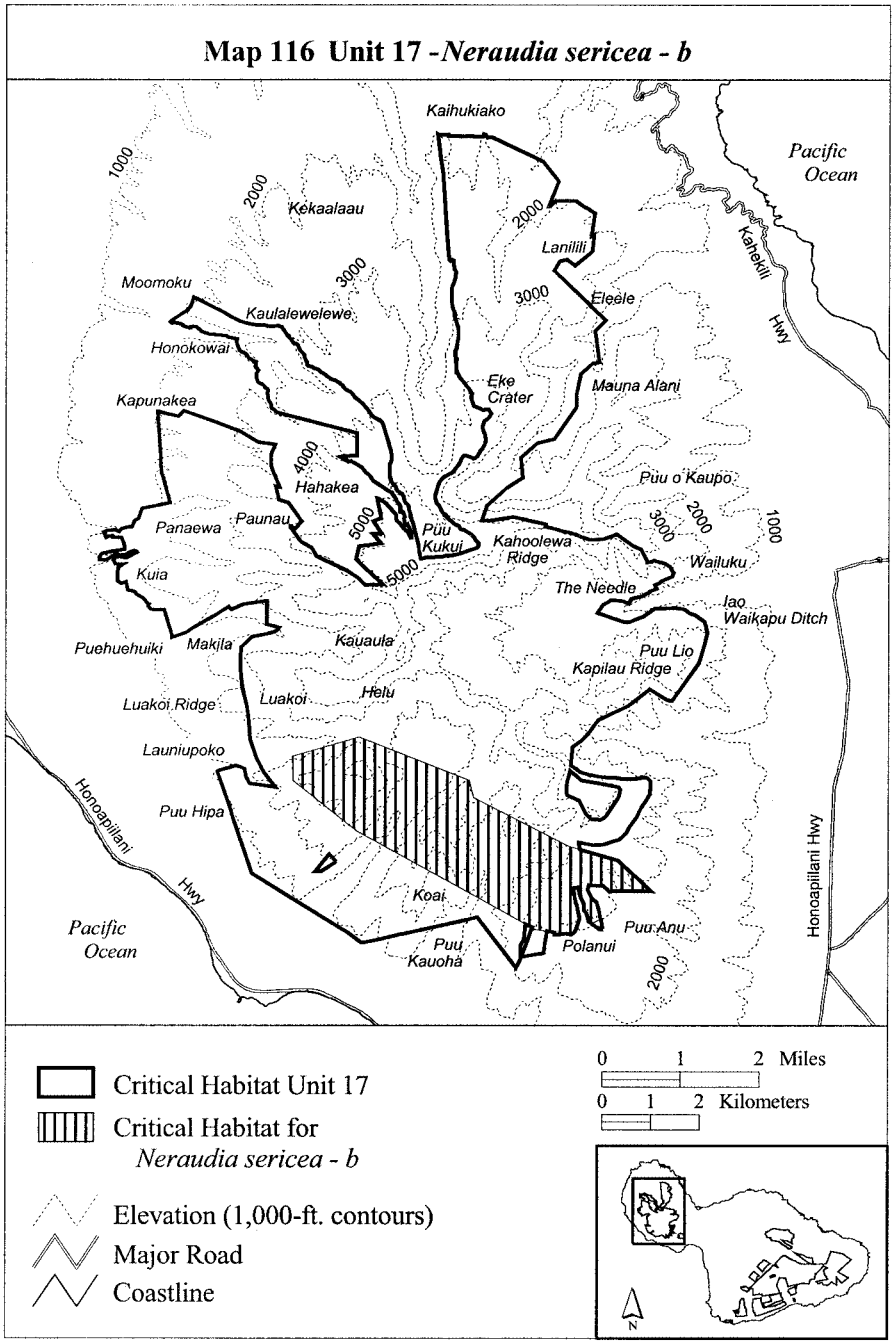
(B) **Note:** Map 115 follows:



(cxvi) Maui 17—*Neraudia sericea*—b (1,189 ha; 2,938 ac).

(A) Unit consists of the following 56 boundary points: Start at 754350, 2305894; 755139, 2305668; 755567, 2305273; 755828, 2305033; 755089, 2305043; 755087, 2305045; 754979, 2305016; 754831, 2305142; 754762, 2305147; 754540, 2305162; 754519, 2305074; 754515, 2305057; 754540, 2305011; 754546, 2305000; 754546, 2305000; 754621, 2304863; 754699, 2304812; 754760, 2304616; 754771, 2304529; 754777, 2304488; 754780, 2304459; 754601, 2304367; 754542, 2304415; 754486, 2304579; 754439, 2304653; 754438, 2304725; 754437, 2304765; 754435, 2304770; 754349, 2304956; 754320, 2305103; 754319, 2305108; 754309, 2305107; 754214, 2305093; 754235, 2304991; 754278, 2304785; 754282, 2304767; 754351, 2304474; 754342, 2304448; 754333, 2304422; 754324, 2304394; 754323, 2304390; 754277, 2304259; 754255, 2304193; 754171, 2304150; 754067, 2304164; 753832, 2304195; 753811, 2304198; 753675, 2304217; 753449, 2304247; 749789, 2306260; 748476, 2307315; 748455, 2307820; 749832, 2308208; 752082, 2307325; 752168, 2306959; 754128, 2305958; return to starting point.

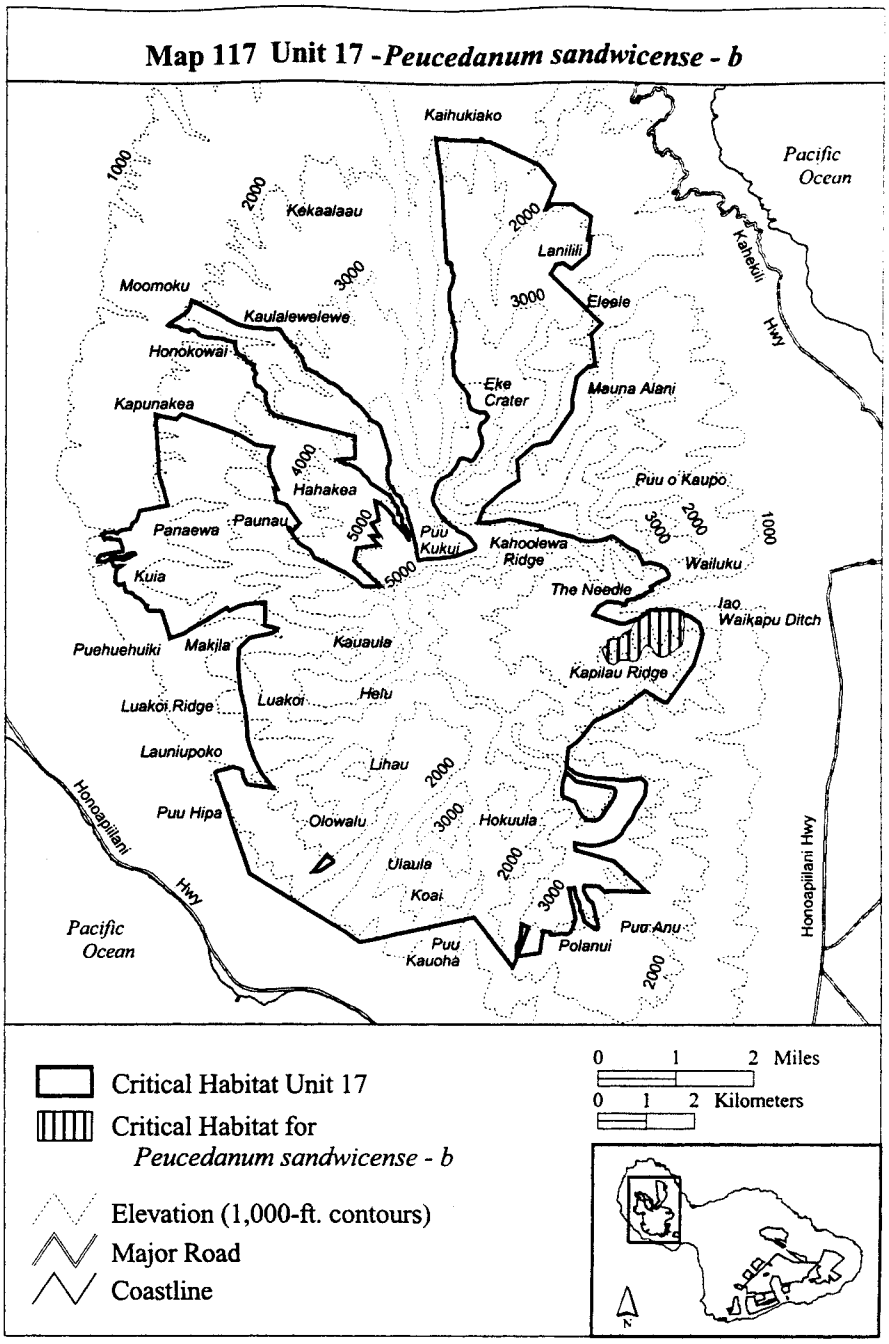
(B) **Note:** Map 116 follows:



(cxvii) Maui 17—*Peucedanum sandwicense*—b (117 ha; 289 ac).

(A) Unit consists of the following 41 boundary points: Start at 755661, 2310703; 755670, 2310709; 755718, 2310743; 755890, 2310863; 755896, 2310864; 756325, 2310873; 756497, 2310849; 756549, 2310816; 756582, 2310768; 756582, 2310767; 756578, 2310701; 756602, 2310559; 756578, 2310444; 756578, 2310273; 756549, 2310135; 756463, 2310087; 756387, 2310011; 756287, 2309973; 756216, 2309911; 756116, 2309892; 756068, 2309906; 755992, 2309963; 755930, 2310082; 755806, 2310140; 755735, 2310078; 755697, 2309982; 755659, 2309873; 755587, 2309811; 755502, 2309811; 755430, 2309835; 755292, 2309835; 755140, 2309730; 755002, 2309797; 754882, 2310059; 754982, 2310125; 755002, 2310244; 755068, 2310268; 755221, 2310259; 755344, 2310382; 755492, 2310463; 755573, 2310625; return to starting point.

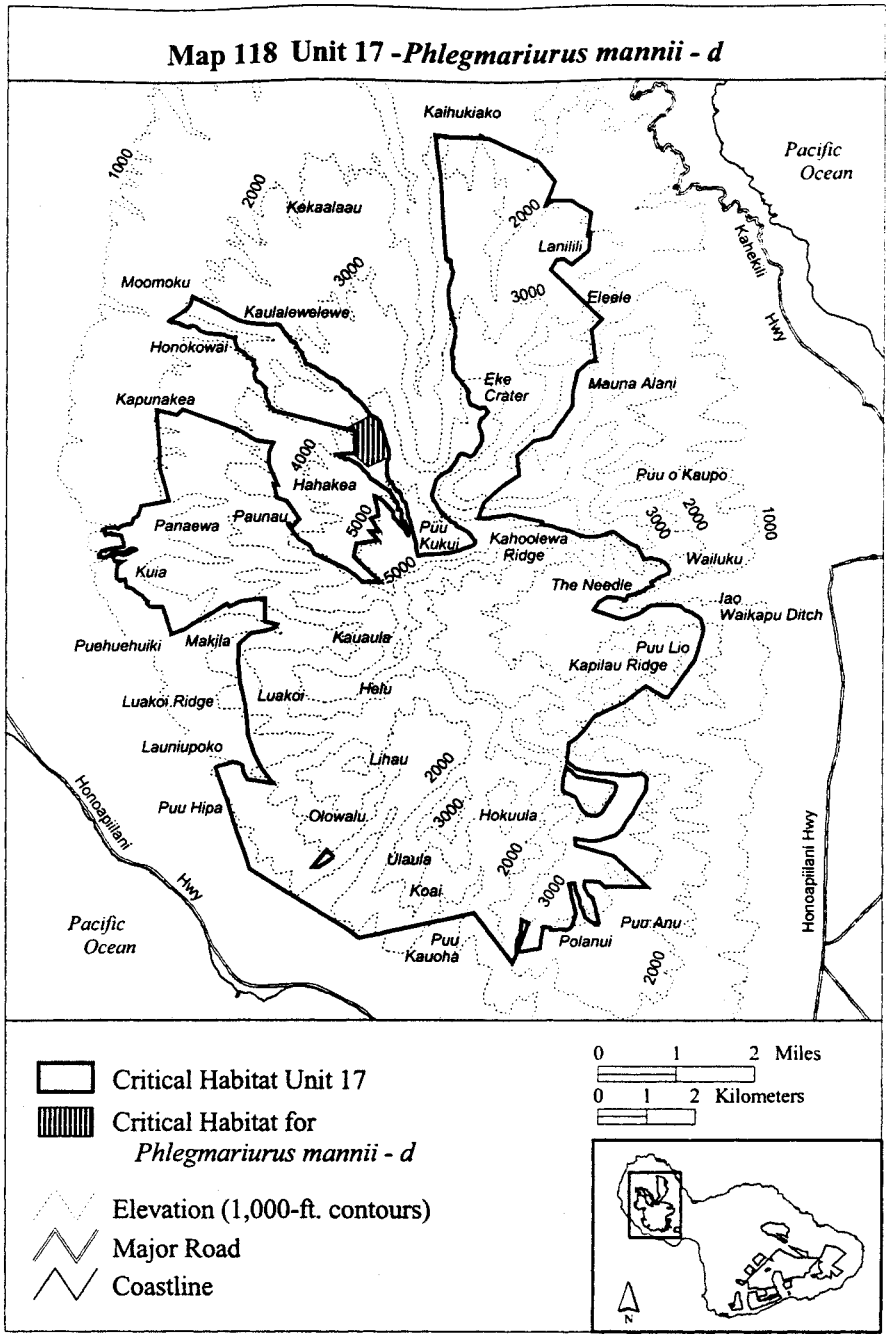
(B) **Note:** Map 117 follows:



(cxviii) Maui 17—*Phlegmariurus mannii*—d (57 ha; 140 ac).

(A) Unit consists of the following 34 boundary points: Start at 749731, 2314023; 749762, 2314024; 749763, 2314024; 749764, 2314024; 749764, 2314025; 749766, 2314245; 749769, 2314498; 749768, 2314500; 749767, 2314500; 749602, 2314542; 750115, 2314813; 750120, 2314809; 750138, 2314798; 750173, 2314786; 750215, 2314763; 750223, 2314758; 750232, 2314754; 750246, 2314737; 750265, 2314720; 750286, 2314703; 750288, 2314702; 750386, 2314362; 750454, 2314143; 750461, 2314125; 750462, 2314110; 750462, 2314098; 750469, 2314075; 750476, 2314039; 750478, 2314029; 750479, 2314015; 750481, 2313991; 750479, 2313958; 750479, 2313948; 750046, 2313750; return to starting point.

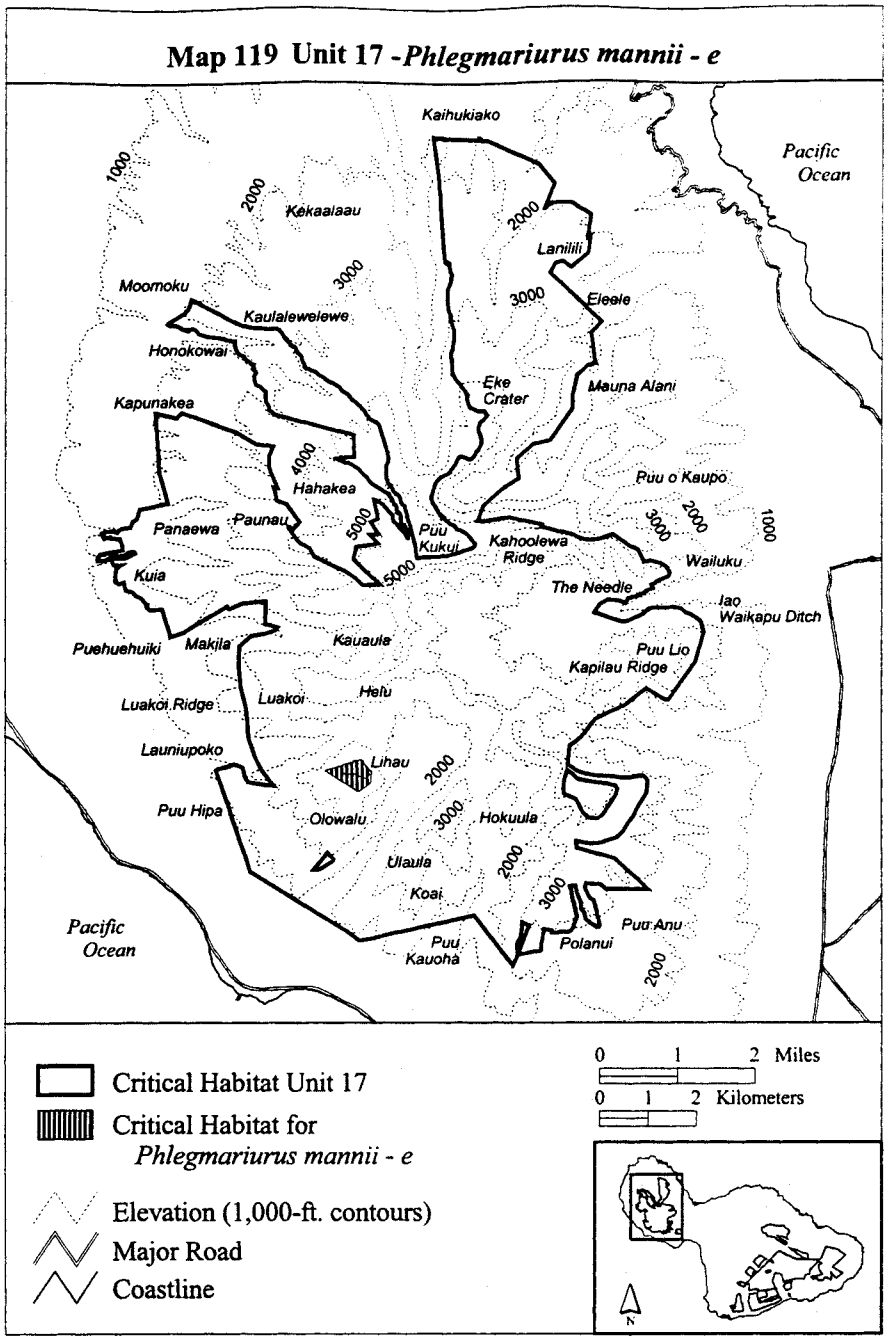
(B) **Note:** Map 118 follows:



(cxix) Maui 17—*Phlegmariurus mannii*—e (35 ha; 87 ac).

(A) Unit consists of the following 5 boundary points: Start at 749857, 2307053; 749164, 2307491; 749922, 2307722; 750135, 2307470; 750105, 2307233; return to starting point.

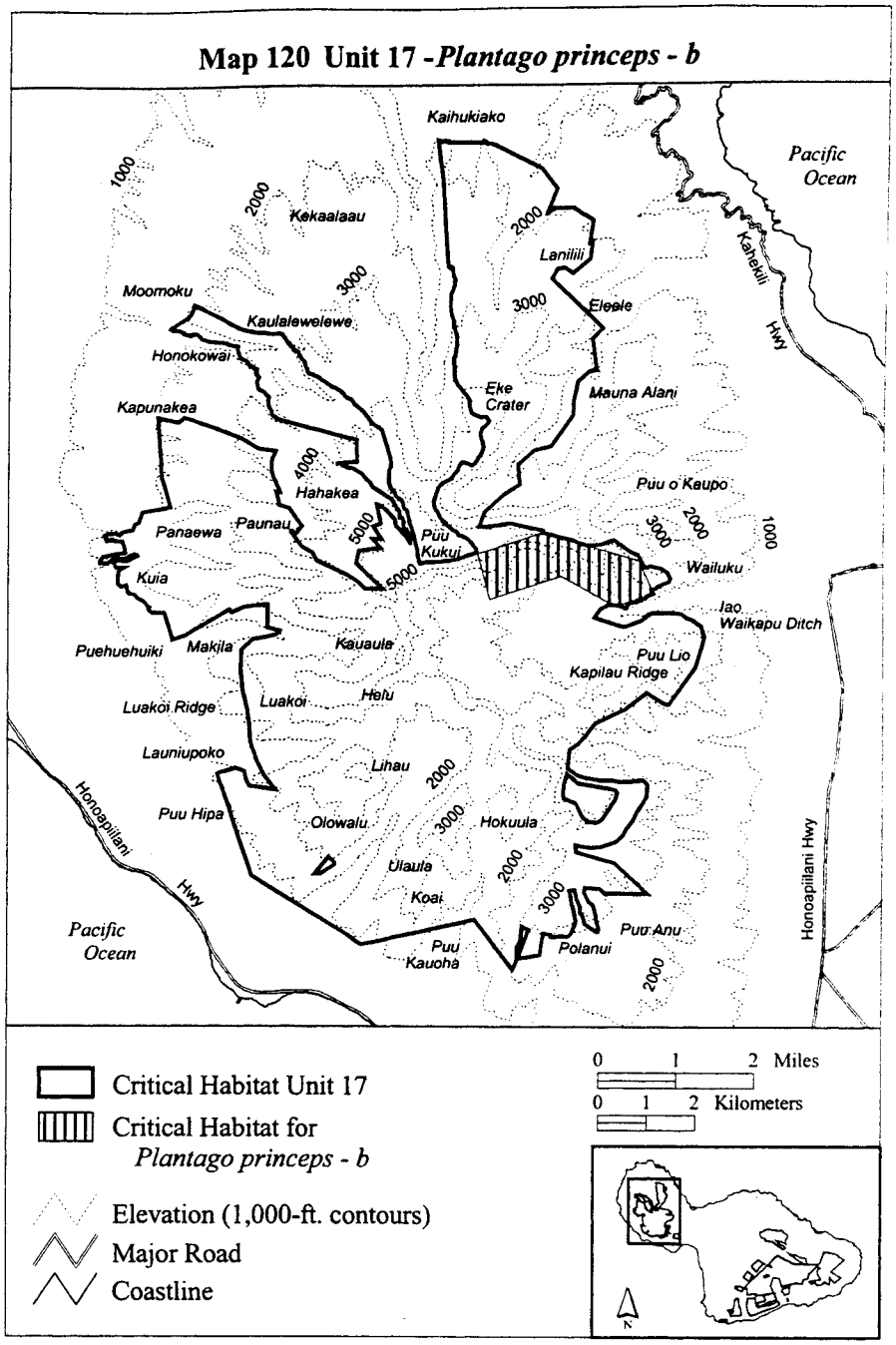
(B) **Note:** Map 119 follows:



(cxx) Maui 17—*Plantago princeps*—b (327 ha; 808 ac).

(A) Unit consists of the following 16 boundary points: Start at 755885, 2311350; 755922, 2311264; 755790, 2311220; 755197, 2311022; 755103, 2311031; 754021, 2311640; 752538, 2311146; 752284, 2312106; 752542, 2312180; 753629, 2312550; 753645, 2312555; 753846, 2312495; 754009, 2312447; 754379, 2312336; 754546, 2312287; 755617, 2311968; return to starting point.

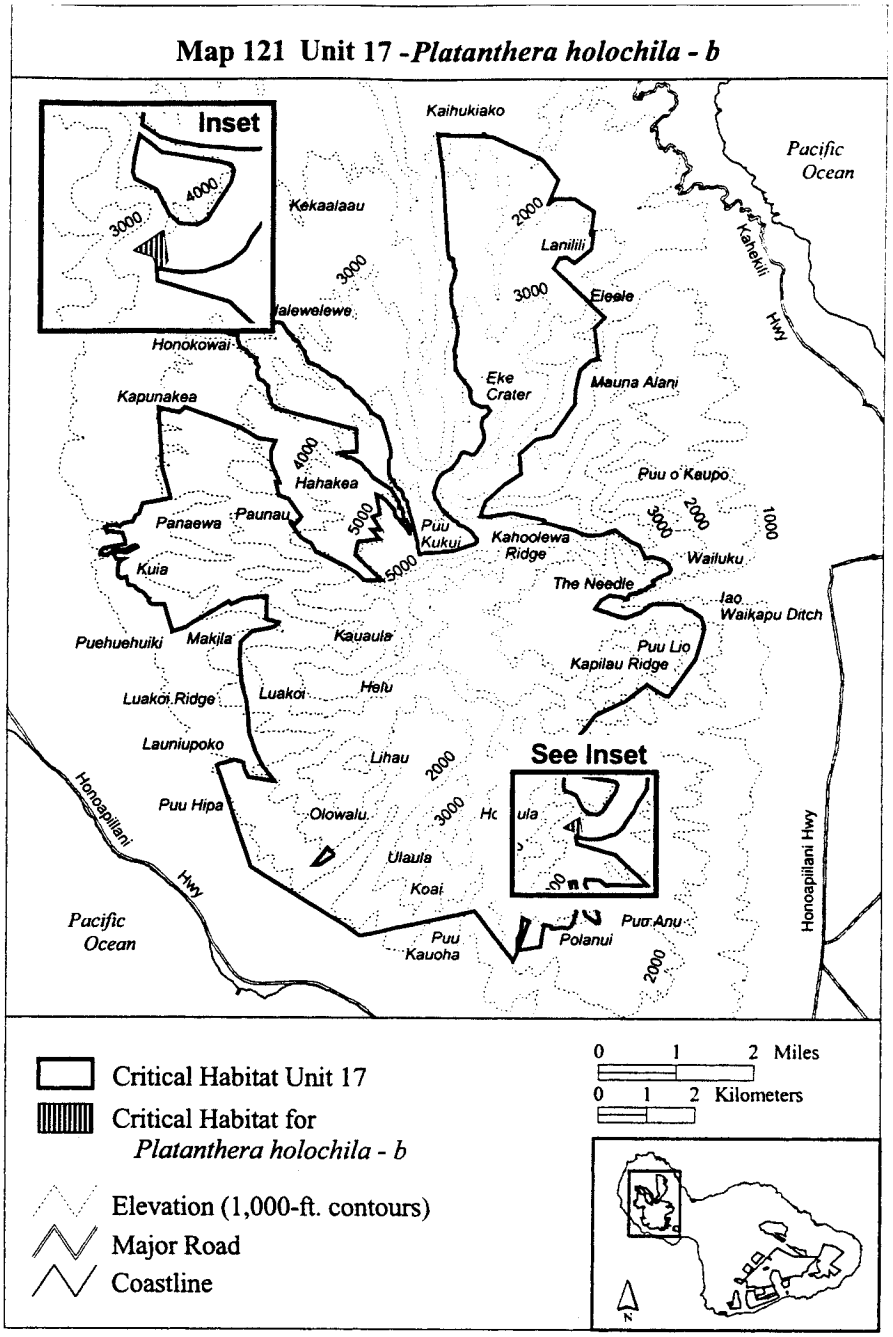
(B) **Note:** Map 120 follows:



(cxxi) Maui 17—*Platanthera holochila*—b (8 ha; 19 ac).

(A) Unit consists of the following 7 boundary points: Start at 754412, 2306019; 754341, 2306032; 754341, 2306031; 754290, 2306152; 754075, 2306222; 754409, 2306447; 754465, 2306113; return to starting point.

(B) **Note:** Map 121 follows:

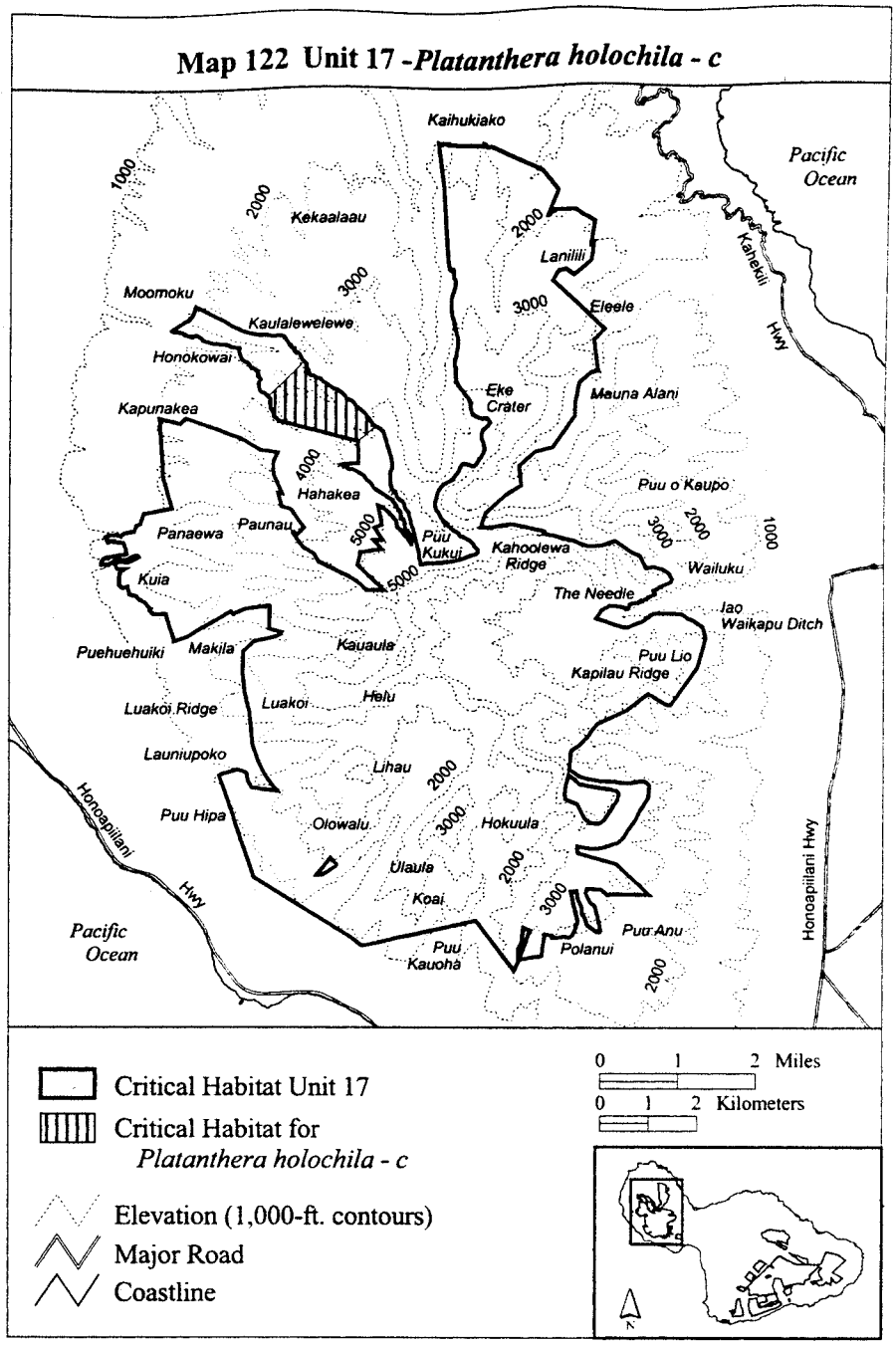


(cxxii) Maui 17—*Platanthera holochila*—c (189 ha; 467 ac).

(A) Unit consists of the following 99 boundary points: Start at 749766, 2314500; 748184, 2314906; 748128, 2314930; 748092, 2314946; 748091, 2314947; 748090, 2314947; 748089, 2314948; 748069, 2314973; 748068, 2314973; 748029, 2314987; 748007, 2315005; 748001, 2315029; 748005, 2315065; 748005, 2315083; 747994, 2315106; 747975, 2315127; 747954, 2315161; 747942, 2315193; 747940, 2315201; 747933, 2315253; 747929, 2315289; 747930, 2315329; 747935, 2315356; 747931, 2315379; 747914, 2315403; 747887, 2315423; 747885, 2315426; 748574, 2316083; 748639, 2316154; 748649, 2316141; 748680, 2316102; 748682, 2316095; 748687, 2316079; 748691, 2316057; 748698, 2316026; 748698, 2316025; 748717, 2315987; 748731, 2315953; 748738, 2315922; 748743, 2315901; 748750, 2315885; 748758, 2315876; 748759, 2315875; 748770, 2315868; 748796, 2315863; 748806, 2315862; 748826, 2315861; 748849, 2315847; 748876, 2315834; 748913, 2315824; 748949, 2315807; 748960, 2315800; 749000, 2315773; 749021, 2315756; 749067, 2315724; 749090, 2315709; 749140, 2315671; 749173, 2315647; 749188, 2315640; 749205, 2315627; 749223, 2315614; 749244, 2315605; 749315, 2315575; 749336, 2315565; 749353, 2315555; 749385, 2315535; 749404, 2315524; 749421, 2315514; 749470, 2315477; 749479, 2315464; 749486, 2315451; 749500, 2315430; 749524, 2315402; 749550, 2315385; 749571, 2315373; 749617, 2315351; 749628, 2315342; 749652, 2315326; 749666, 2315306; 749677, 2315288; 749682, 2315280; 749701, 2315256; 749720, 2315236; 749736, 2315224; 749781, 2315186; 749797, 2315177; 749814, 2315164; 749833, 2315147; 749874,

2315098; 749888, 2315088; 749934, 2315046; 749960, 2315009; 750020, 2314928; 750057, 2314876; 750072, 2314855; 750097, 2314830; 750120, 2314809; 750138, 2314798; 750139, 2314798; return to starting point.

(B) **Note:** Map 122 follows:

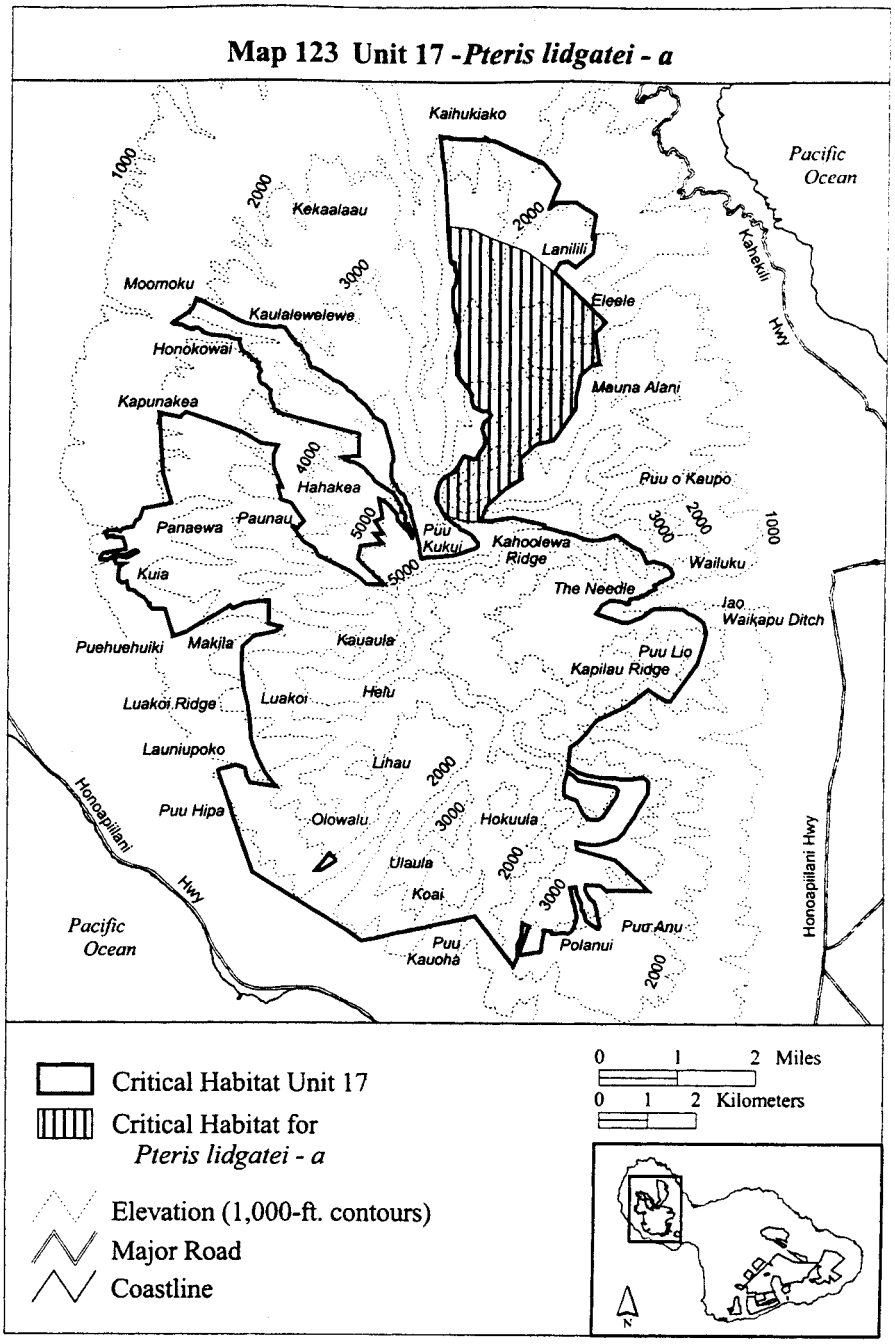


(cxxiii) Maui 17—*Pteris lidgatei*—a (1,168 ha; 2,887 ac).

(A) Unit consists of the following 211 boundary points: Start at 751582, 2312795; 751577, 2312796; 751528, 2312835; 751509, 2312866; 751494, 2312898; 751477, 2312924; 751470, 2312949; 751455, 2312970; 751447, 2312990; 751430, 2313008; 751409, 2313034; 751396, 2313055; 751392, 2313077; 751379, 2313115; 751372, 2313144; 751371, 2313166; 751372, 2313195; 751376, 2313220; 751378, 2313242; 751391, 2313266; 751395, 2313289; 751399, 2313300; 751407, 2313325; 751423, 2313372; 751434, 2313402; 751442, 2313431; 751445, 2313445; 751458, 2313470; 751460, 2313473; 751483, 2313503; 751510, 2313537; 751525, 2313552; 751530, 2313556; 751547, 2313568; 751557, 2313585; 751561, 2313589; 751596, 2313611; 751632, 2313629; 751663, 2313639; 751692, 2313653; 751724, 2313678; 751730, 2313685; 751736, 2313691; 751741, 2313698; 751753, 2313712; 751774, 2313739; 751802, 2313779; 751812, 2313796; 751834, 2313826; 751848, 2313852; 751858, 2313865; 751891, 2313928; 751915,

2313975; 751943, 2314006; 751962, 2314018; 751999, 2314023; 752033, 2314016; 752081, 2313996; 752123, 2313971; 752153, 2313965; 752154, 2313965; 752187, 2313971; 752206, 2313984; 752220, 2314004; 752241, 2314040; 752255, 2314066; 752280, 2314106; 752298, 2314135; 752326, 2314169; 752350, 2314207; 752375, 2314234; 752375, 2314235; 752380, 2314285; 752390, 2314310; 752394, 2314322; 752394, 2314323; 752390, 2314361; 752385, 2314401; 752376, 2314456; 752359, 2314508; 752350, 2314542; 752334, 2314592; 752332, 2314632; 752340, 2314668; 752351, 2314710; 752369, 2314743; 752392, 2314761; 752420, 2314774; 752451, 2314798; 752466, 2314821; 752482, 2314848; 752505, 2314885; 752505, 2314886; 752505, 2314887; 752495, 2314905; 752453, 2314975; 752453, 2314976; 752448, 2314976; 752453, 2314984; 752376, 2314996; 752366, 2314973; 752362, 2314970; 752342, 2314967; 752250, 2315013; 752158, 2315058; 752138, 2315091; 752117, 2315151; 752108, 2315196; 752103, 2315252; 752113, 2315300; 752112, 2315302; 752096, 2315325; 752085, 2315344; 752070, 2315374; 752051, 2315406; 752026, 2315438; 751991, 2315478; 751949, 2315532; 751900, 2315589; 751856, 2315640; 751831, 2315694; 751805, 2315739; 751802, 2315745; 751780, 2316007; 751791, 2316023; 751792, 2316024; 751792, 2316025; 751785, 2316046; 751774, 2316078; 751771, 2316121; 751767, 2316164; 751778, 2316192; 751794, 2316230; 751799, 2316258; 751807, 2316311; 751812, 2316339; 751828, 2316408; 751840, 2316469; 751842, 2316535; 751836, 2316587; 751832, 2316640; 751828, 2316678; 751828, 2316679; 751812, 2316711; 751793, 2316765; 751774, 2316831; 751763, 2316879; 751754, 2316929; 751744, 2317001; 751727, 2317051; 751703, 2317090; 751693, 2317225; 751691, 2317254; 751693, 2317261; 751698, 2317290; 751694, 2317322; 751695, 2317366; 751697, 2317415; 751702, 2317462; 751715, 2317522; 751728, 2317571; 751747, 2317619; 751767, 2317682; 751769, 2317710; 751778, 2317751; 751782, 2317790; 751782, 2317791; 751769, 2317829; 751750, 2317859; 751741, 2317901; 751738, 2317949; 751738, 2317997; 751730, 2318034; 751729, 2318035; 751714, 2318045; 751713, 2318046; 751712, 2318046; 751690, 2318034; 751665, 2318030; 751651, 2318051; 751640, 2318085; 751632, 2318124; 751632, 2318131; 751630, 2318160; 751587, 2318788; 752124, 2318723; 752171, 2318701; 752172, 2318700; 752441, 2318572; 753228, 2318261; 753719, 2317901; 753788, 2317835; 754546, 2317117; 754543, 2317112; 754622, 2317045; 754855, 2316824; 754646, 2316585; 754736, 2315958; 754586, 2315928; 754347, 2315718; 754257, 2315300; 754257, 2315031; 753809, 2314373; 753450, 2314284; 753121, 2313985; 753151, 2313566; 752822, 2313357; 752434, 2312998; 752317, 2312676; 752314, 2312669; 752040, 2312664; return to starting point.

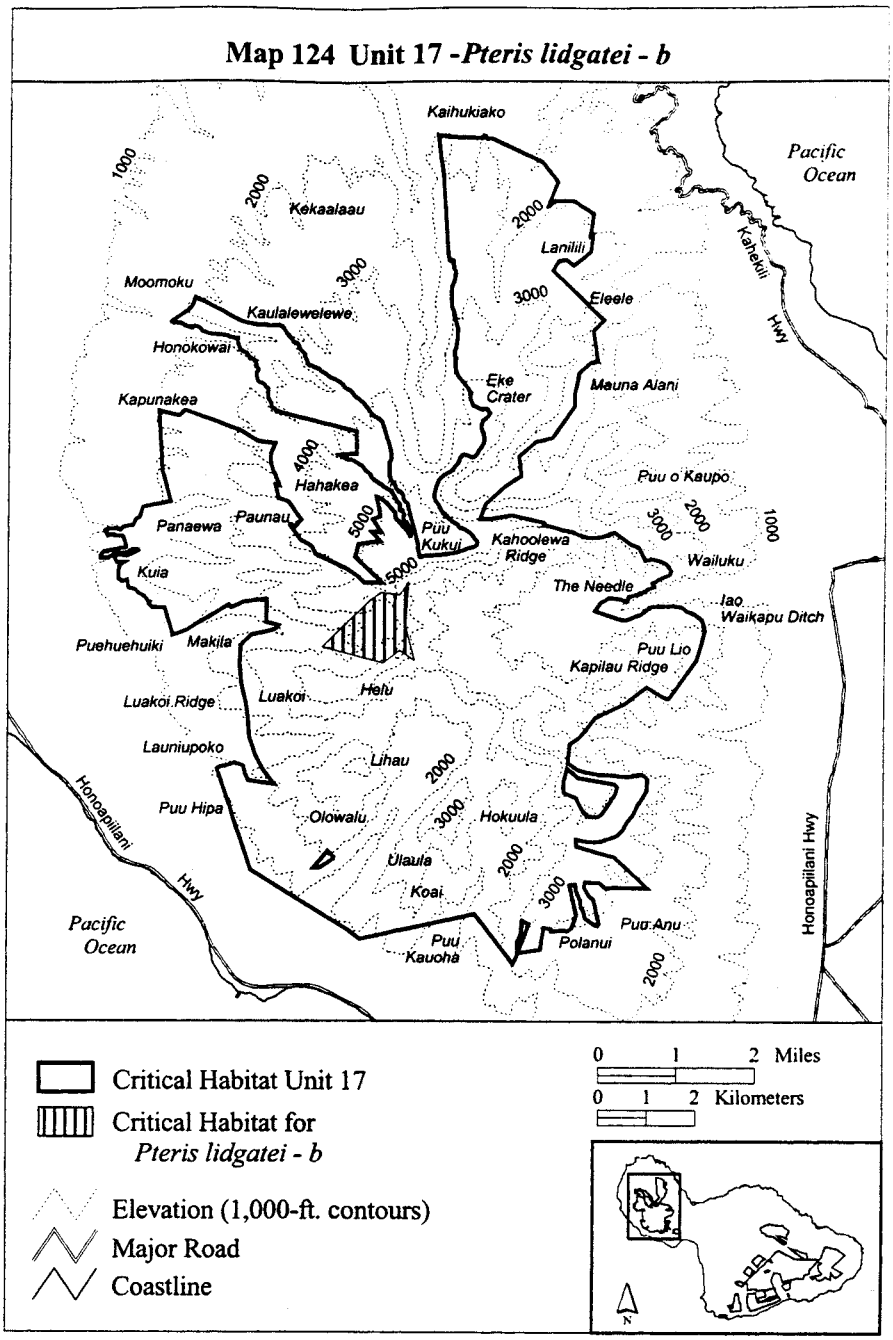
(B) **Note:** Map 123 follows:



(cxxiv) Maui 17—*Pteris lidgatei*—b (164 ha; 404 ac).

(A) Unit consists of the following 9 boundary points: Start at 750072, 2310995; 750282, 2311145; 750670, 2311085; 750850, 2311354; 750790, 2310427; 750969, 2309740; 750670, 2309949; 750341, 2309680; 749086, 2310009; return to starting point.

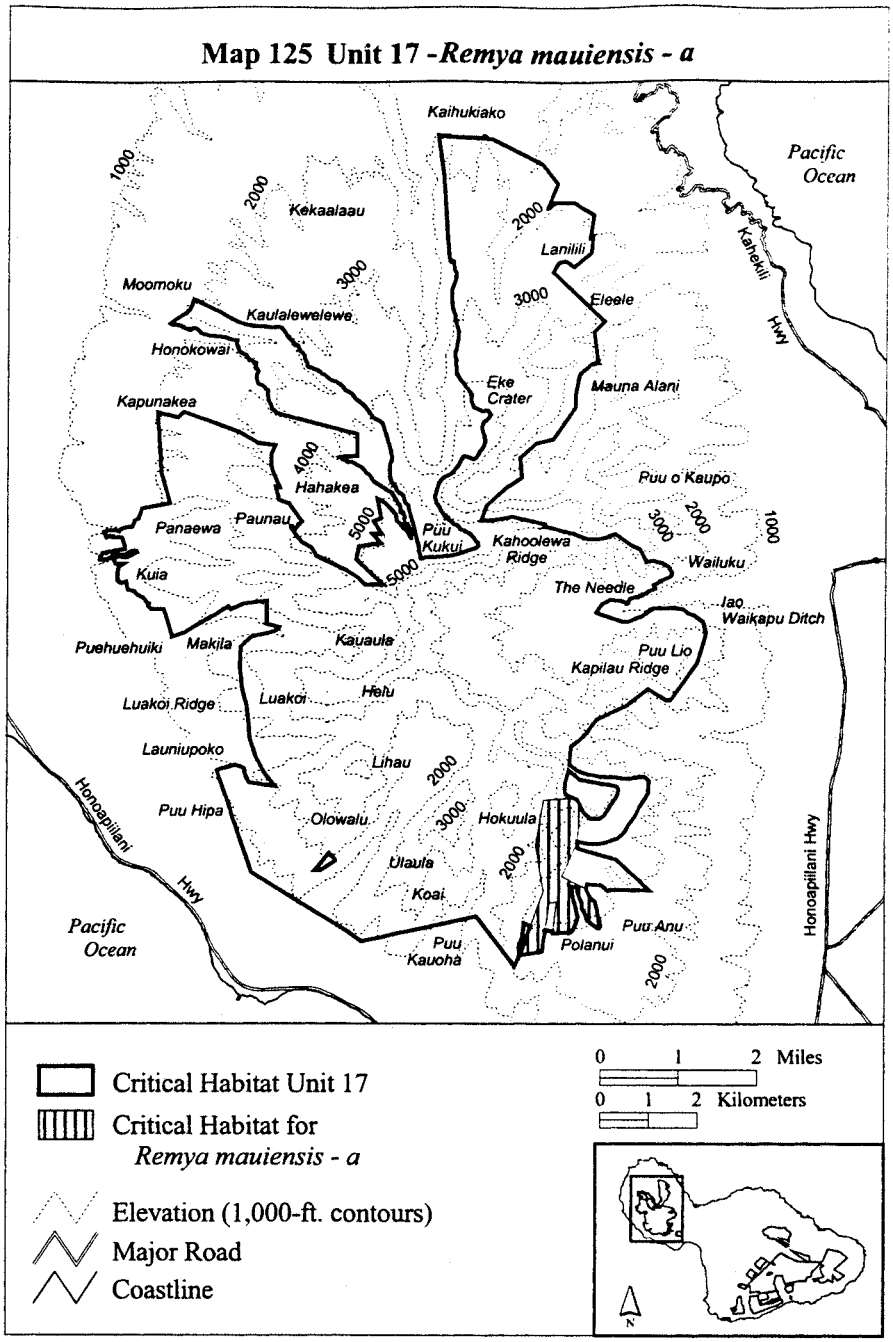
(B) **Note:** Map 124 follows:



(cxxv) Maui 17—*Remya mauiensis*—a (228 ha; 564 ac).

(A) Unit consists of the following 61 boundary points: Start at 754336, 2306037; 754335, 2306032; 754334, 2306014; 754022, 2305314; 754484, 2305080; 754534, 2305022; 754537, 2305016; 754540, 2305011; 754621, 2304863; 754699, 2304812; 754773, 2304280; 754776, 2304259; 754769, 2304263; 754670, 2304324; 754605, 2304364; 754603, 2304366; 754542, 2304415; 754499, 2304541; 754356, 2305091; 754320, 2305103; 754319, 2305108; 754309, 2305107; 754122, 2305169; 754172, 2305069; 754235, 2304991; 754238, 2304988; 754242, 2304971; 754278, 2304785; 754282, 2304767; 754312, 2304638; 754336, 2304537; 754343, 2304451; 754343, 2304450; 754342, 2304448; 754333, 2304422; 754327, 2304403; 754279, 2304263; 754165, 2304205; 754078, 2304169; 753828, 2304146; 753911, 2304797; 753750, 2304769; 753606, 2303761; 753602, 2303760; 753576, 2303756; 753552, 2303751; 753534, 2303749; 753531, 2303748; 753515, 2303745; 753154, 2303686; 753252, 2303966; 753304, 2304113; 753310, 2304130; 753365, 2304285; 753367, 2304292; 753628, 2305002; 753472, 2305975; 753622, 2306887; 754189, 2306927; 754311, 2306887; 754387, 2306765; return to starting point.

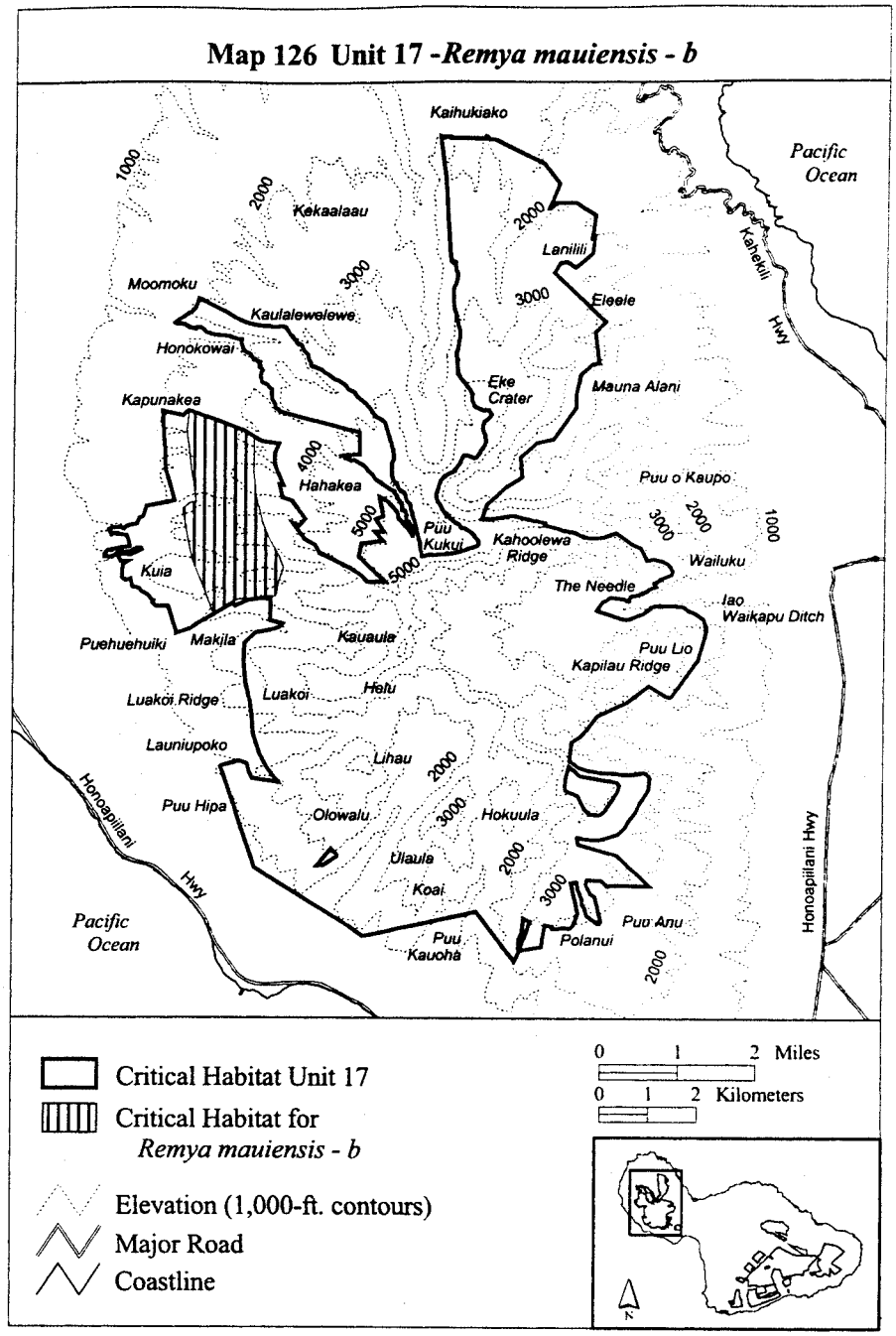
(B) **Note:** Map 125 follows:



(cxxvi) Maui 17—*remya mauiensis*—b (567 ha; 1,401 ac).

(A) Unit consists of the following 30 boundary points: Start at 746995, 2310813; 746762, 2310659; 746754, 2310674; 746719, 2310734; 746452, 2311437; 746303, 2311773; 746170, 2312397; 746101, 2312866; 746244, 2312994; 746324, 2313016; 746372, 2313015; 746273, 2313672; 746174, 2314527; 746227, 2314946; 746887, 2314706; 747359, 2314534; 747564, 2314406; 747564, 2313642; 747609, 2313176; 747674, 2312935; 747689, 2312936; 747743, 2312584; 747871, 2312291; 748089, 2311885; 748185, 2311619; 748123, 2311444; 748084, 2311336; 748036, 2311038; 747487, 2310984; 747263, 2310990; return to starting point.

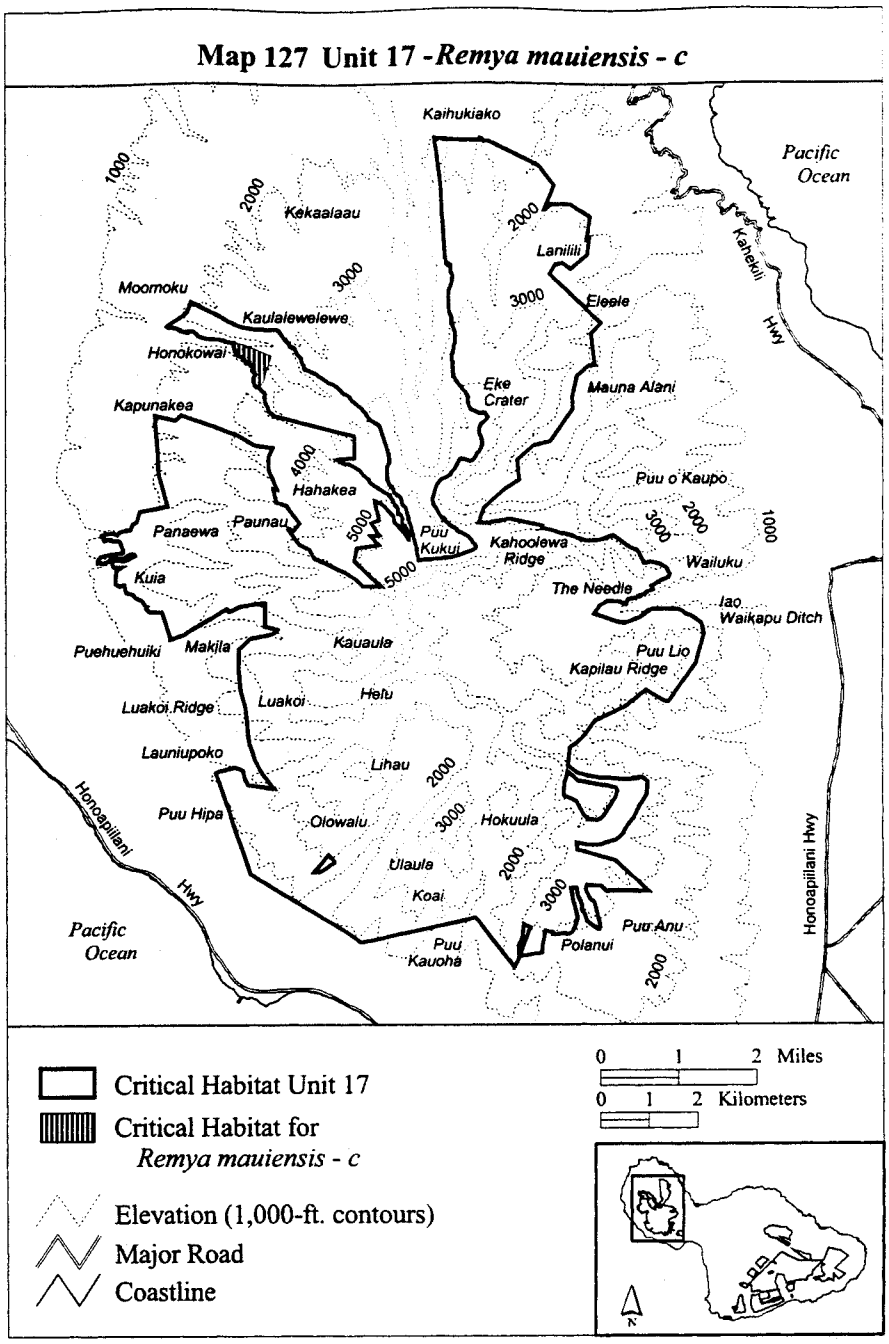
(B) **Note:** Map 126 follows:



(cxxvii) Maui 17—*Remya mauiensis*—c (32 ha; 78 ac).

(A) Unit consists of the following 52 boundary points: Start at 747792, 2315504; 747750, 2315521; 747726, 2315545; 747722, 2315552; 747704, 2315583; 747698, 2315635; 747693, 2315665; 747695, 2315687; 747702, 2315718; 747713, 2315745; 747728, 2315775; 747729, 2315792; 747729, 2315793; 747717, 2315811; 747717, 2315812; 747697, 2315822; 747681, 2315836; 747675, 2315860; 747677, 2315876; 747681, 2315899; 747681, 2315918; 747667, 2315950; 747648, 2315974; 747620, 2315996; 747585, 2316012; 747546, 2316034; 747526, 2316055; 747508, 2316086; 747494, 2316109; 747476, 2316129; 747447, 2316142; 747409, 2316159; 747389, 2316169; 747365, 2316186; 747345, 2316212; 747336, 2316228; 747328, 2316244; 747312, 2316282; 747299, 2316323; 747290, 2316361; 747289, 2316384; 747289, 2316392; 747296, 2316429; 747296, 2316430; 747296, 2316431; 747295, 2316431; 747296, 2316436; 747510, 2316405; 748060, 2316161; 747945, 2315810; 747915, 2315650; 747824, 2315486; return to starting point.

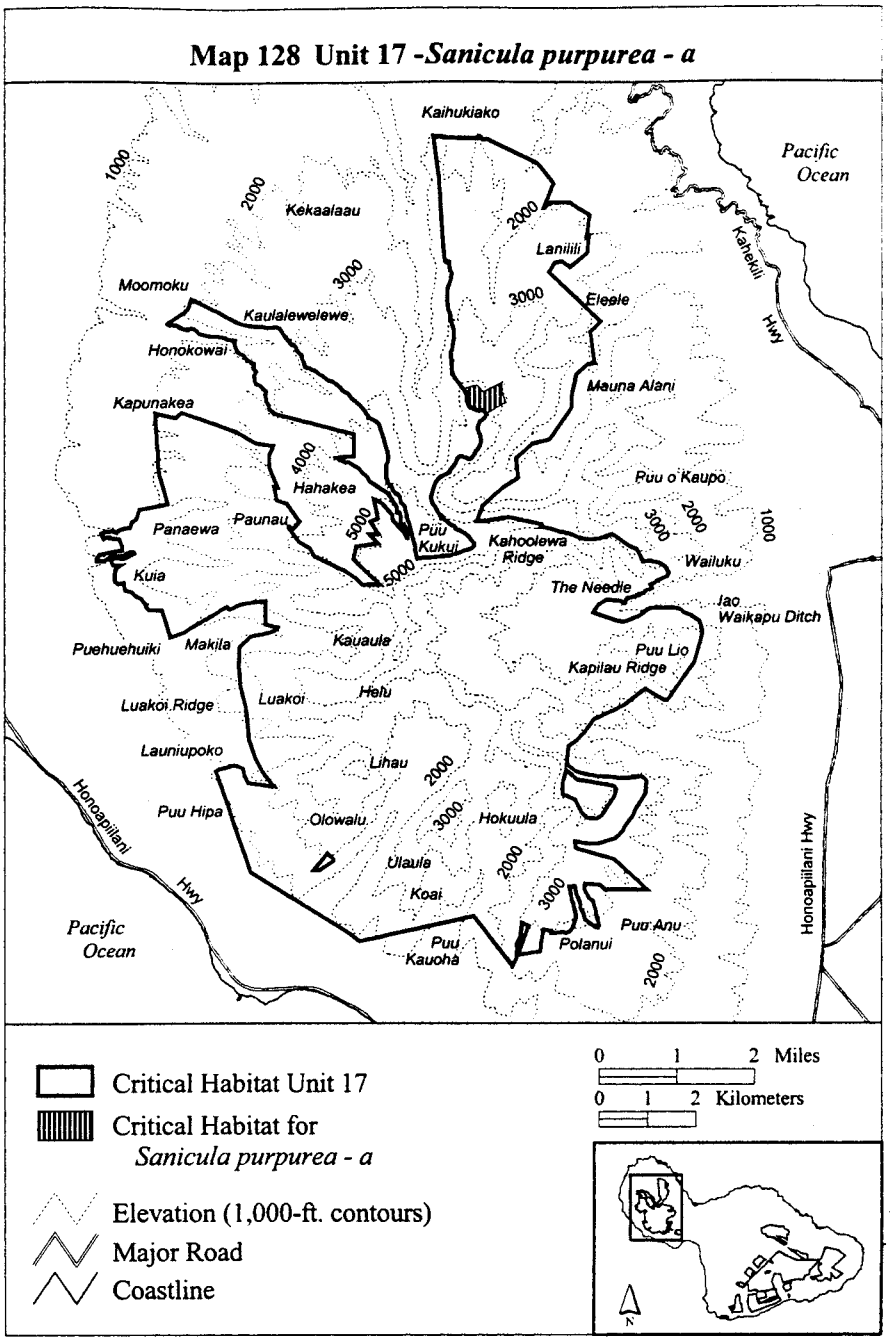
(B) **Note:** Map 127 follows:



(cxxviii) Maui 17—*Sanicula purpurea*—a (34 ha; 84 ac).

(A) Unit consists of the following 26 boundary points: Start at 752495, 2314905; 752453, 2314975; 752453, 2314976; 752416, 2314975; 752381, 2314973; 752342, 2314967; 752250, 2315013; 752158, 2315058; 752138, 2315091; 752117, 2315151; 752108, 2315196; 752103, 2315252; 752113, 2315300; 752112, 2315302; 752096, 2315325; 752085, 2315344; 752070, 2315374; 752051, 2315406; 752043, 2315416; 752194, 2315469; 752315, 2315502; 752449, 2315352; 752817, 2315548; 752838, 2315319; 752900, 2315143; 752499, 2314898; return to starting point.

(B) **Note:** Map 128 follows:

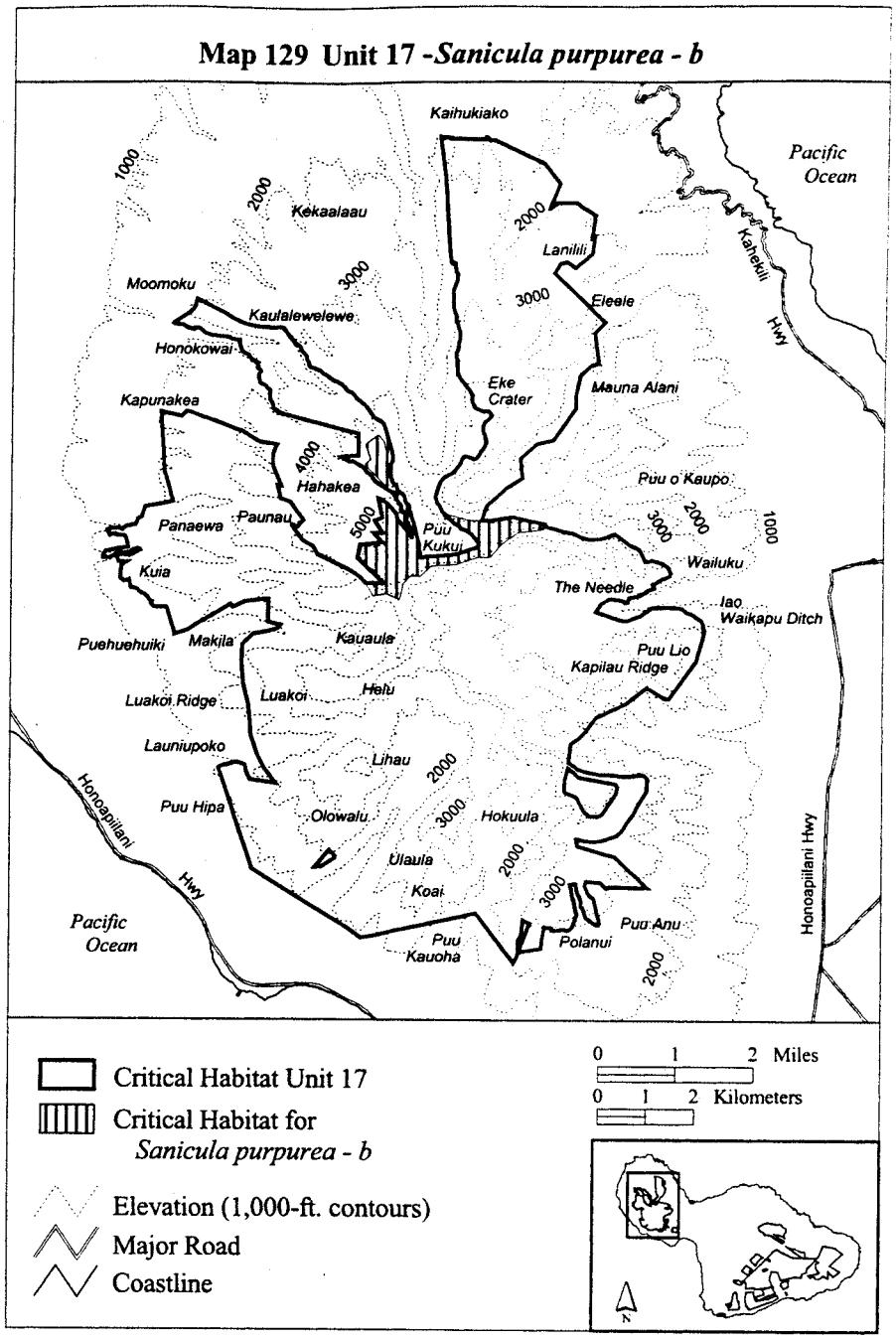


(cxxix) Maui 17—*Sanicula purpurea*—b (306 ha; 756 ac).

(A) Unit consists of the following 270 boundary points: Start at 749939, 2311346; 750305, 2311362; 749759, 2311879; 749818, 2312144; 750261, 2312204; 750099, 2312396; 750276, 2312410; 750113, 2312661; 750261, 2312735; 750185, 2313139; 750220, 2313118; 750265, 2313091; 750306, 2313067; 750358, 2313037; 750373, 2313023; 750566, 2312802; 750568, 2312798; 750565, 2312761; 750564, 2312729; 750574, 2312687; 750574, 2312686; 750581, 2312676; 750586, 2312670; 750636, 2312621; 750675, 2312576; 750701, 2312549; 750729, 2312518; 750733, 2312514; 750763, 2312476; 750804, 2312434; 750835, 2312384; 750877, 2312324; 750877, 2312323; 750878, 2312323; 750879, 2312323; 750880, 2312324; 750889, 2312378; 750889, 2312379; 750885, 2312387; 750887, 2312412; 750887, 2312413; 750876, 2312455; 750851, 2312517; 750819, 2312576; 750799, 2312595; 750799, 2312596; 750798, 2312596; 750757, 2312591; 750749, 2312590; 750747, 2312611; 750734, 2312726; 750739, 2312751; 750739, 2312752; 750730, 2312793; 750712, 2312846; 750711, 2312846; 750711, 2312847; 750691, 2312851; 750690, 2312851; 750687, 2312849; 750671, 2312852; 750654, 2312855; 750651, 2312867; 750650, 2312873; 750649, 2312880; 750650, 2312898; 750652, 2312927; 750658, 2312963; 750658, 2312964; 750636, 2313003; 750632, 2313007; 750567, 2313111; 750565, 2313117; 750562, 2313122; 750571, 2313119; 750482, 2313247; 750468, 2313267; 749907, 2313828; 750025, 2313946; 749907, 2314271; 750187, 2314463; 750305, 2314315; 750379,

2313917; 750339, 2314523; 750386, 2314362; 750414, 2314272; 750454, 2314143; 750461, 2314125; 750462, 2314110; 750462, 2314098; 750469, 2314075; 750476, 2314039; 750478, 2314029; 750479, 2314015; 750481, 2313991; 750479, 2313958; 750479, 2313946; 750479, 2313933; 750476, 2313919; 750468, 2313903; 750450, 2313871; 750441, 2313851; 750441, 2313850; 750438, 2313827; 750440, 2313794; 750439, 2313772; 750436, 2313747; 750437, 2313723; 750437, 2313700; 750439, 2313671; 750438, 2313647; 750435, 2313610; 750436, 2313597; 750436, 2313596; 750441, 2313585; 750451, 2313562; 750456, 2313545; 750463, 2313528; 750465, 2313510; 750469, 2313497; 750469, 2313496; 750477, 2313484; 750491, 2313465; 750505, 2313443; 750510, 2313432; 750515, 2313420; 750526, 2313409; 750541, 2313398; 750551, 2313389; 750560, 2313367; 750565, 2313356; 750572, 2313334; 750578, 2313319; 750591, 2313304; 750609, 2313283; 750640, 2313257; 750643, 2313255; 750652, 2313247; 750674, 2313233; 750689, 2313219; 750704, 2313203; 750713, 2313180; 750725, 2313151; 750736, 2313118; 750747, 2313077; 750753, 2313062; 750767, 2313040; 750774, 2313031; 750792, 2313015; 750803, 2313003; 750815, 2312997; 750834, 2312921; 750866, 2312797; 750864, 2312784; 750864, 2312768; 750864, 2312767; 750868, 2312756; 750877, 2312736; 750881, 2312727; 750882, 2312717; 750888, 2312691; 750895, 2312668; 750904, 2312647; 750904, 2312646; 750905, 2312646; 751008, 2312240; 751038, 2312126; 751038, 2312124; 751038, 2312088; 751038, 2312083; 751034, 2312059; 751040, 2312045; 751059, 2311963; 751065, 2311938; 751066, 2311935; 751077, 2311889; 751077, 2311888; 751078, 2311887; 751079, 2311887; 751095, 2311890; 751115, 2311894; 751125, 2311897; 751154, 2311907; 751190, 2311915; 751210, 2311916; 751266, 2311917; 751317, 2311916; 751353, 2311910; 751415, 2311923; 751455, 2311926; 751502, 2311927; 751574, 2311945; 751610, 2311953; 751637, 2311945; 751638, 2311945; 751682, 2311949; 751730, 2311960; 751772, 2311971; 751845, 2311984; 751888, 2311992; 751889, 2311992; 751963, 2312014; 752001, 2312036; 752045, 2312060; 752095, 2312064; 752133, 2312081; 752177, 2312098; 752226, 2312119; 752255, 2312146; 752255, 2312147; 752257, 2312154; 752258, 2312161; 752260, 2312173; 752260, 2312174; 752259, 2312178; 752259, 2312186; 752255, 2312201; 752254, 2312203; 752242, 2312224; 752209, 2312264; 752181, 2312294; 752174, 2312305; 752146, 2312343; 752130, 2312360; 752109, 2312384; 752089, 2312404; 752052, 2312430; 752018, 2312454; 751992, 2312468; 751944, 2312486; 751906, 2312492; 751887, 2312501; 751874, 2312514; 751860, 2312545; 751852, 2312558; 751828, 2312576; 751812, 2312583; 751790, 2312588; 751769, 2312599; 751747, 2312616; 751708, 2312656; 751683, 2312672; 751660, 2312697; 751625, 2312730; 751609, 2312742; 751590, 2312761; 751567, 2312785; 751582, 2312795; 751605, 2312809; 752078, 2312676; 752317, 2312676; 752521, 2312676; 752964, 2312750; 753643, 2312602; 753629, 2312550; 753611, 2312482; 753082, 2312425; 752728, 2312174; 752491, 2311908; 752255, 2311908; 751812, 2311746; 751295, 2311716; 751059, 2311495; 750881, 2311509; 750704, 2311347; 750630, 2311007; 750360, 2311126; 750081, 2311078; 749999, 2311246; 749928, 2311346; return to starting point.

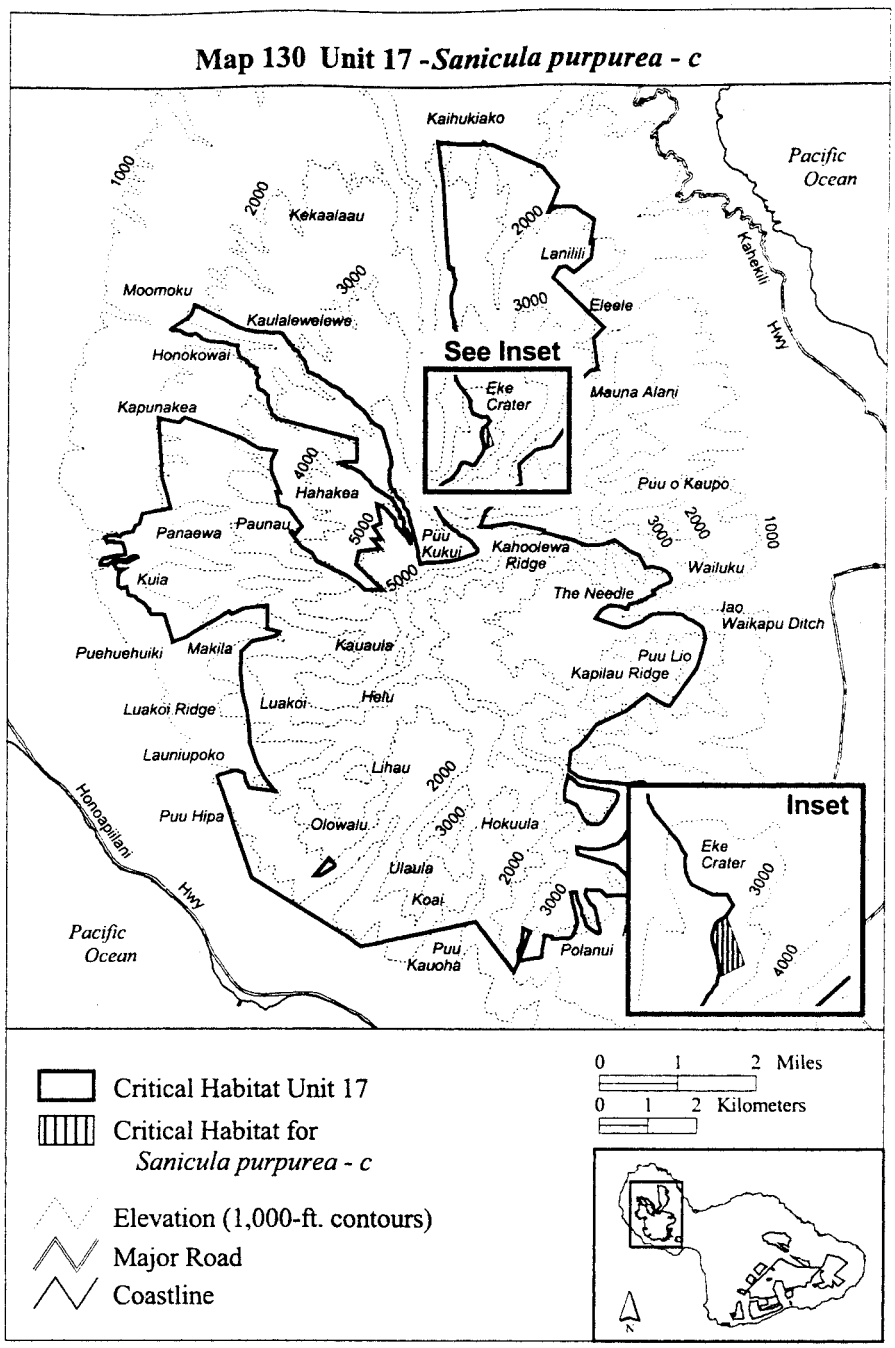
(B) **Note:** Map 129 follows:



(cxxx) Maui 17—*Sanicula purpurea*—c (8 ha; 19 ac).

(A) Unit consists of the following 19 boundary points: Start at 752386, 2314300; 752390, 2314310; 752394, 2314322; 752394, 2314323; 752390, 2314361; 752385, 2314401; 752376, 2314456; 752359, 2314508; 752350, 2314542; 752334, 2314592; 752332, 2314632; 752340, 2314668; 752351, 2314710; 752369, 2314743; 752392, 2314761; 752420, 2314774; 752448, 2314795; 752604, 2314395; 752382, 2314282; return to starting point.

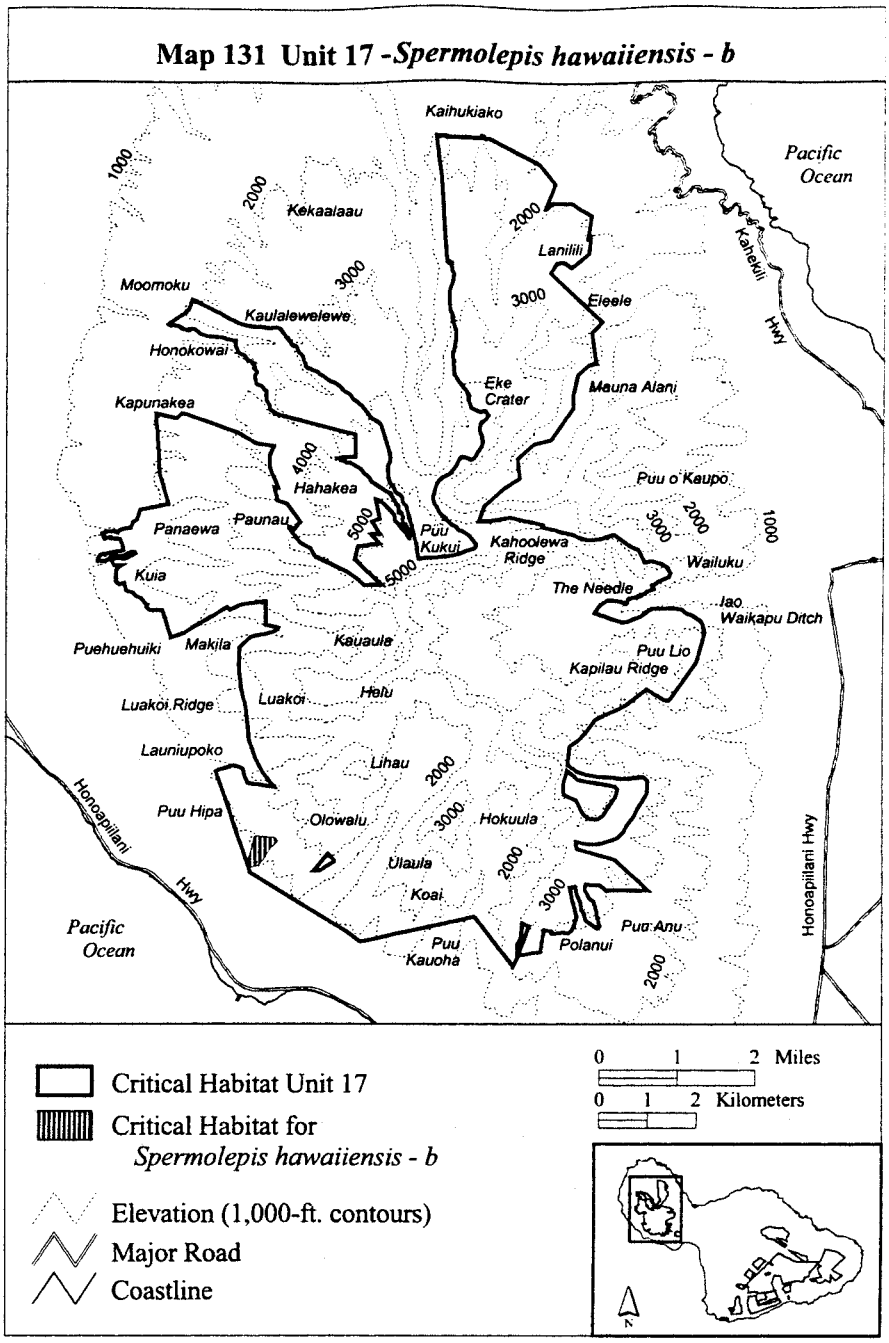
(B) **Note:** Map 130 follows:



(cxxxi) Maui 17—*Spermolepis hawaiiensis*—b (23 ha; 56 ac).

(A) Unit consists of the following 15 boundary points: Start at 747559, 2305612; 747617, 2305791; 747703, 2306156; 747789, 2306167; 747843, 2306153; 747942, 2306144; 748010, 2306130; 748096, 2306137; 748170, 2306086; 748184, 2306061; 748161, 2306016; 748049, 2305919; 747908, 2305689; 747771, 2305547; 747640, 2305517; return to starting point.

(B) **Note:** Map 131 follows:



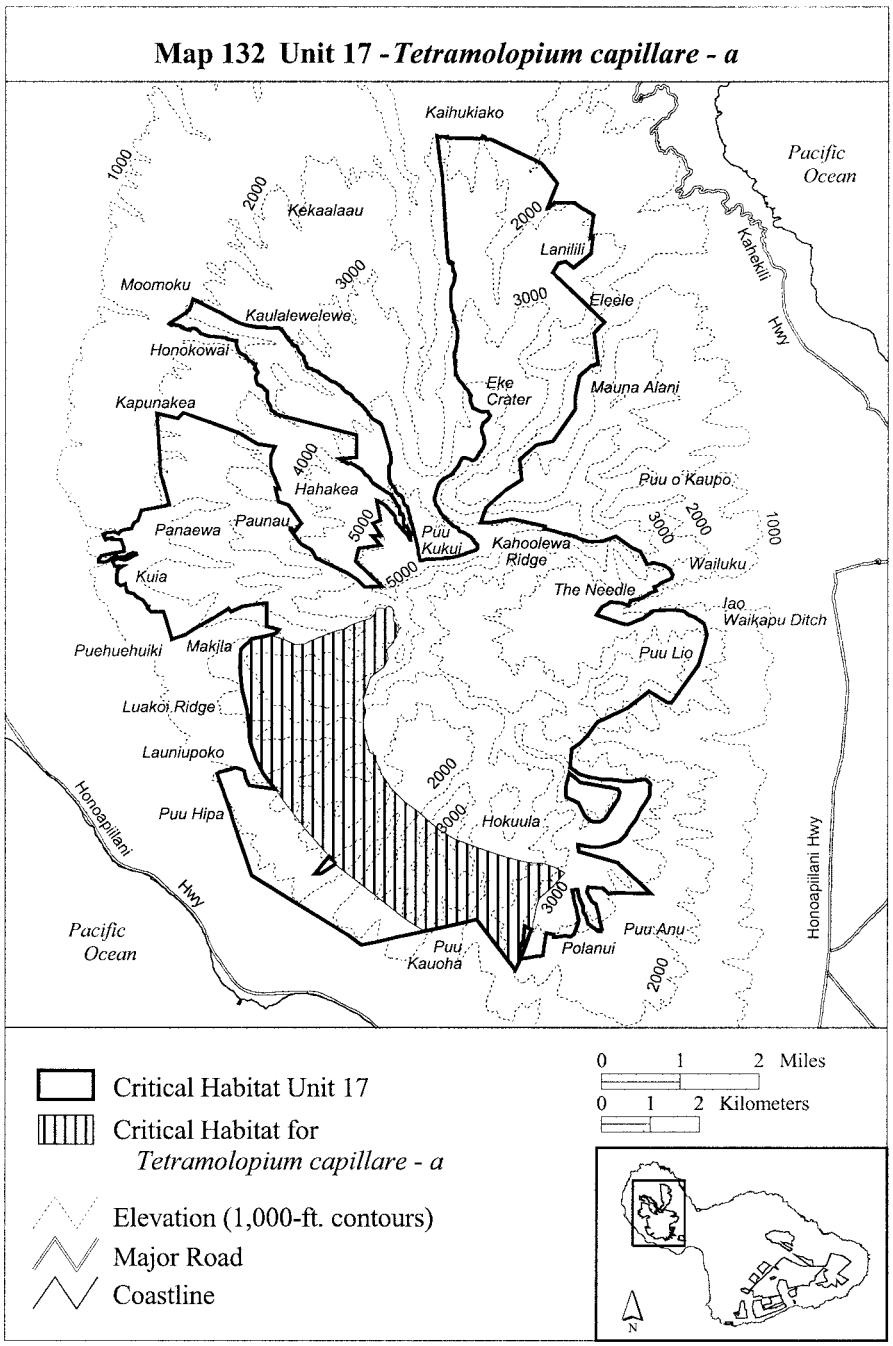
(cxxxii) Maui 17—*Tetramolopium capillare*—a (1,783 ha; 4,405 ac).

(A) Unit consists of the following 106 boundary points: Start at 753165, 2303717; 753304, 2304113; 753310, 2304130; 753365, 2304285; 753367, 2304292; 753234, 2304365; 753213, 2304104; 753136, 2303909; 753136, 2303821; 753136, 2303653; 753134, 2303650; 753042, 2303454; 752244, 2304494; 752075, 2304457; 751171, 2304258; 750787, 2304513; 750132, 2305024; 749428, 2305569; 749226, 2305793; 748731, 2306342; 748269, 2306956; 748096, 2307179; 747868, 2307474; 747703, 2307791; 747578, 2308164; 747558, 2308516; 747523, 2308819; 747420, 2309233; 747378, 2309647; 747392, 2310068; 747618, 2310281; 747935, 2310342; 747979, 2310351; 748255, 2310282; 748531, 2310151; 748738, 2310172; 748844, 2310234; 749327, 2310432; 749542, 2310481; 749646, 2310558; 749937, 2310662; 750058, 2310701; 750146, 2310783; 750157, 2310794; 750168, 2310853; 750181, 2310898; 750231, 2310909; 750364, 2310903; 750415, 2310935; 750473, 2310938; 750521, 2310903; 750537, 2310855; 750542, 2310826; 750524, 2310786; 750524, 2310648; 750566, 2310619; 750648, 2310507; 750656, 2310478; 750627, 2310436; 750582, 2310409; 750574, 2310385; 750590, 2310361; 750601, 2310316; 750582, 2310287; 750555, 2310253; 750534, 2310213; 750502, 2310197; 750509, 2310184; 750399, 2310047; 750432, 2309865; 750350, 2309706; 750179, 2309579; 750058, 2309475; 749910, 2308997; 749965, 2308782; 749916, 2308579; 749932, 2308442; 749954, 2308271; 750042, 2307941; 750166, 2307867; 750187, 2307736; 750256, 2307612; 750284,

2307494; 750442, 2307287; 750465, 2307217; 750753, 2306922; 751036, 2306728; 751439, 2306361; 751774, 2306157; 752327, 2305947; 752871, 2305768; 753260, 2305683; 753470, 2305652; 753563, 2305652; 753626, 2305636; 753874, 2305566; 754007, 2305496; 754053, 2305450; 753820, 2305169; 753540, 2304928; 753462, 2304711; 753427, 2304482; 753399, 2304426; 753396, 2304292; 753299, 2304046; 753237, 2303876; return to starting point.

(B) Excluding the area bounded by the following 11 boundary points (6ha; 15ac): Start at 749362, 2305641; 749057, 2305433; 748930, 2305439; 749226, 2305793; 749363, 2305641; 749363, 2305641; 749363, 2305641; 749363, 2305641; 749363, 2305641; 749362, 2305640; return to starting point.

(C) **Note:** Map 132 follows:

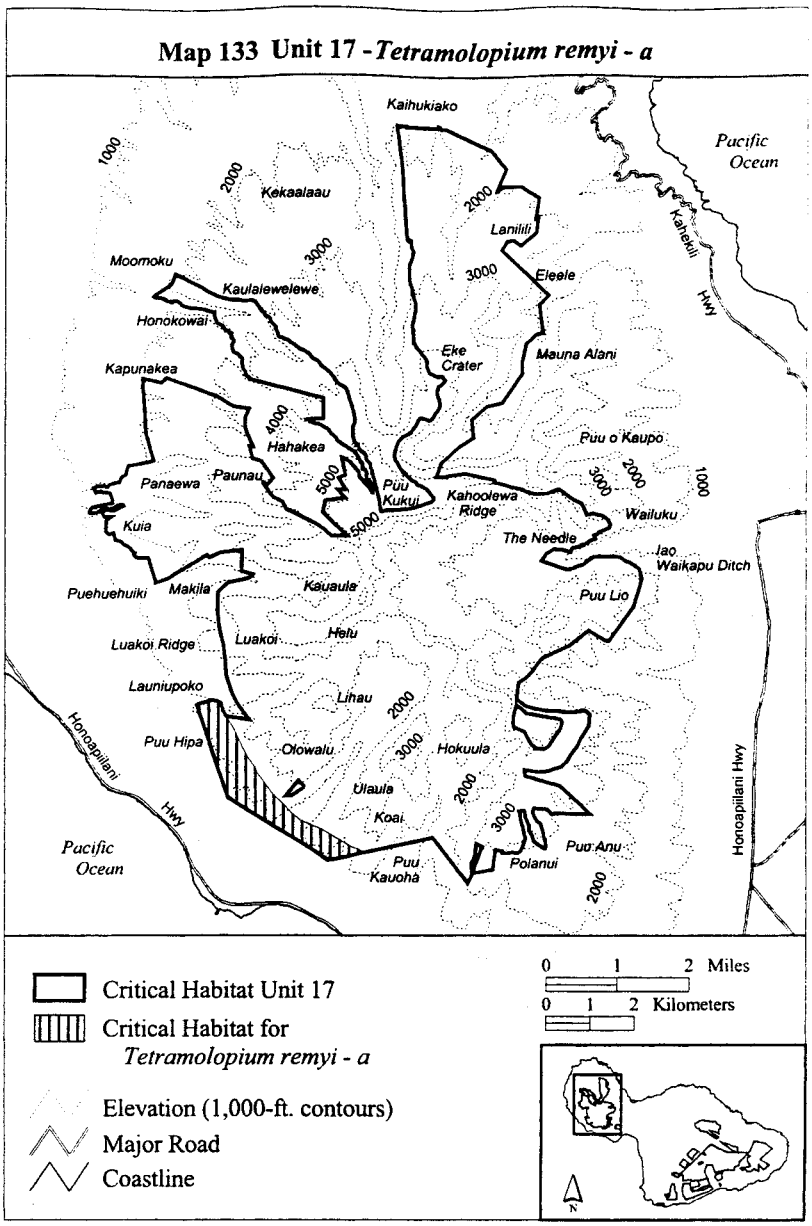


(cxxxiii) Maui 17—*Tetramolopium remyi*—a (288 ha; 711 ac).

(A) Unit consists of the following 34 boundary points: Start at 750702, 2304154; 750687, 2304151; 750686, 2304151; 750680, 2304150; 749916, 2304019; 748359, 2304949; 747628, 2305445; 747343, 2306214; 747283, 2306377; 747263, 2306446; 747206, 2306648; 747191, 2306692; 746912, 2307495; 746967, 2307530; 747135, 2307579; 747275, 2307621; 747405, 2307590; 747464, 2307541; 747496, 2307408; 747571, 2307254; 747576, 2307243; 747664, 2307114; 747769,

2306921; 747937, 2306568; 748094, 2306298; 748227, 2306099; 748294, 2305966; 748613, 2305521; 748914, 2305226; 749056, 2305056; 749264, 2304887; 749718, 2304706; 750413, 2304302; 750566, 2304230; return to starting point.

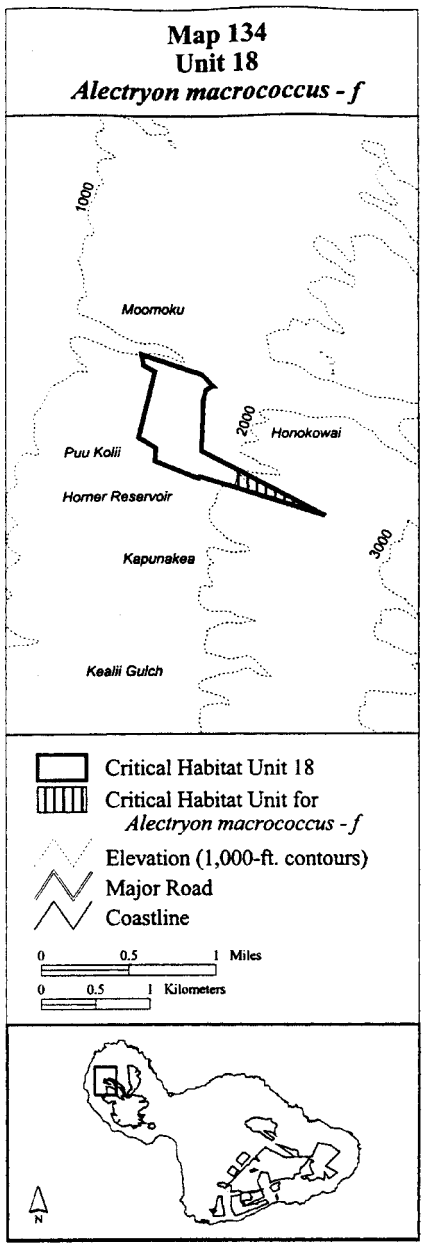
(B) **Note:** Map 133 follows:



(cxxxiv) Maui 18—*Alectryon macrococcus*—f (7 ha; 18 ac).

(A) Unit consists of the following 7 boundary points: Start at 745986, 2315882; 746238, 2315748; 746249, 2315743; 746785, 2315459; 746095, 2315676; 746082, 2315680; 745946, 2315723; return to starting point.

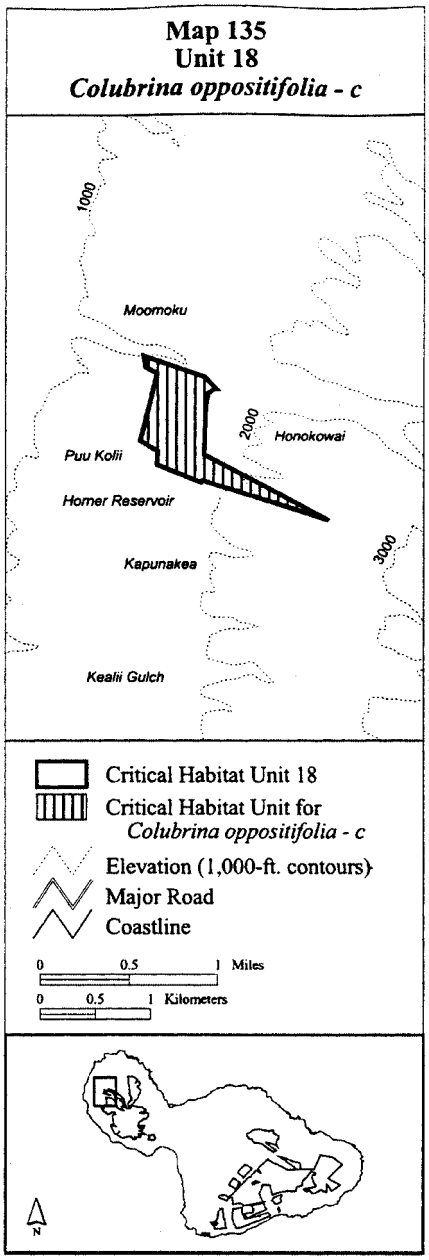
(B) **Note:** Map 134 follows:



(cxxxv) Maui 18—*Colubrina oppositifolia*—c (64 ha; 157 ac).

(A) Unit consists of the following 34 boundary points: Start at 745633, 2315799; 745216, 2315967; 745220, 2316095; 745062, 2316193; 745156, 2316554; 745218, 2316810; 745110, 2316866; 745095, 2316969; 745651, 2316773; 745745, 2316673; 745748, 2316670; 745741, 2316666; 745700, 2316637; 745682, 2316625; 745668, 2316564; 745666, 2316551; 745660, 2316498; 745660, 2316496; 745660, 2316495; 745656, 2316346; 745650, 2316196; 745644, 2316064; 745644, 2316063; 745645, 2316063; 746238, 2315748; 746249, 2315743; 746713, 2315497; 746710, 2315483; 746095, 2315676; 746082, 2315680; 745637, 2315820; 745636, 2315820; 745635, 2315819; 745634, 2315807; return to starting point.

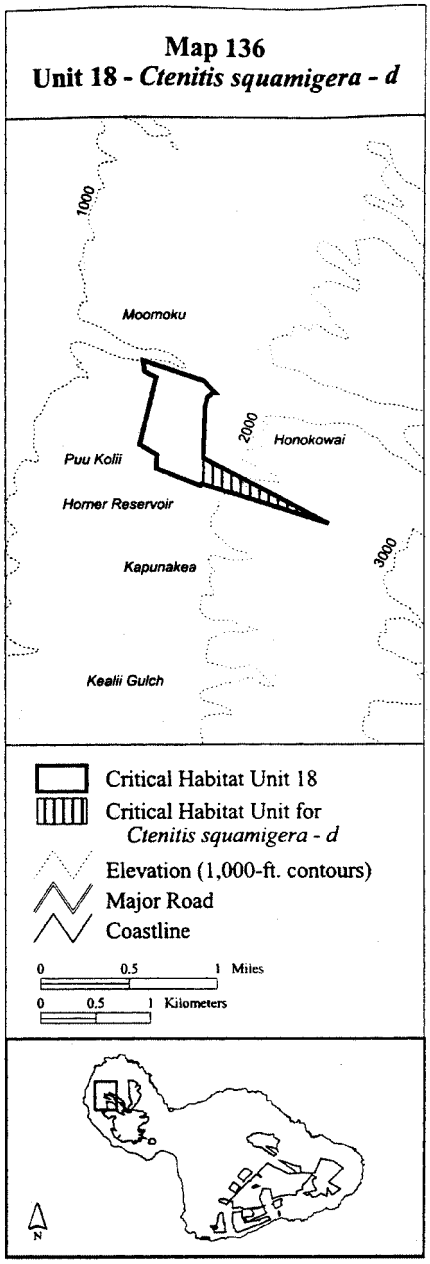
(B) **Note:** Map 135 follows:



(cxxxvi) Maui 18—*Ctenitis squamigera*—d (14 ha; 35 ac).

(A) Unit consists of the following 13 boundary points: Start at 745644, 2316064; 745644, 2316063; 745645, 2316063; 746238, 2315748; 746249, 2315743; 746785, 2315459; 746095, 2315676; 746082, 2315680; 745637, 2315820; 745636, 2315820; 745635, 2315819; 745641, 2316066; 745644, 2316067; return to starting point.

(B) **Note:** Map 136 follows:

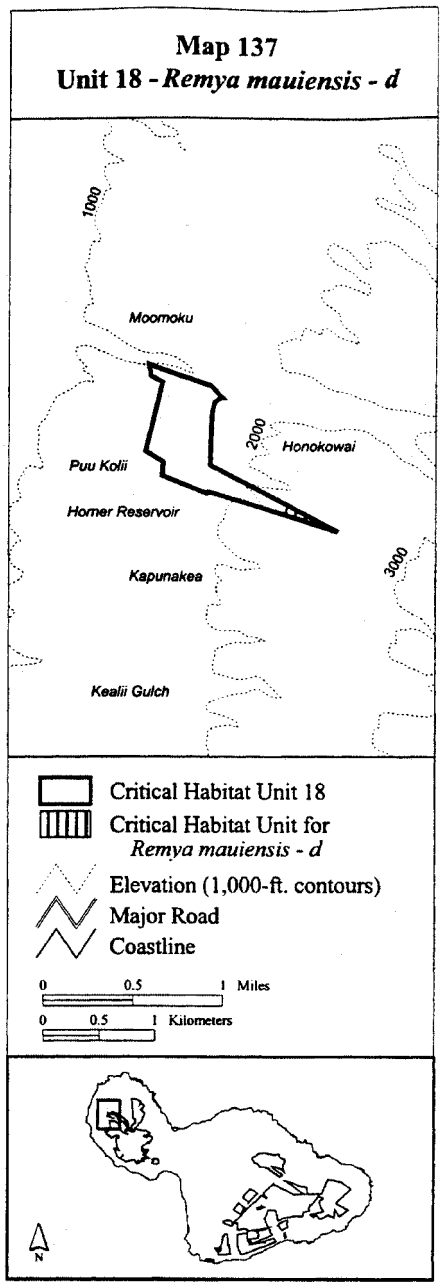


(cxxxvii) Maui 18—*Remya mauiensis*—d (2 ha; 6 ac).

(A) Unit consists of the following 3 boundary points: Start at 746322, 2315704; 746785, 2315459; 746309, 2315609; return to starting point.

(B) **Note:** Map 137 follows:

BILLING CODE 4310–55–C



(cxxxviii) Table of Protected Species Within Each Critical Habitat Unit for Maui

Unit name	Species occupied	Species unoccupied
Maui 1—*Centaurium sebaeoides*—a	*Centaurium sebaeoides*.	
Maui 1—*Sesbania tomentosa*—a	*Sesbania tomentosa*.	
Maui 2—*Brighamia rockii*—a	.....	*Brighamia rockii*.
Maui 2—*Brighamia rockii*—b	.....	*Brighamia rockii*.
Maui 2—*Centaurium sebaeoides*—b	*Centaurium sebaeoides*.	
Maui 3—*Brighamia rockii*—c	.....	*Brighamia rockii*.
Maui 4—*Brighamia rockii*—d	.....	*Brighamia rockii*.
Maui 4—*Peucedanum sandwicense*—a	*Peucedanum sandwicense*.	
Maui 5—*Brighamia rockii*—e	.....	*Brighamia rockii*.
Maui 6—*Ischaemum byrone*—a	*Ischaemum byrone*.	
Maui 6—*Mariscus pennatiformis*—a	*Mariscus pennatiformis*.	
Maui 7—*Ischaemum byrone*—b	*Ischaemum byrone*.	
Maui 8—*Cyanea copelandii* ssp. *haleakalaensis*—a	*Cyanea copelandii* ssp. *haleakalaensis*.	
Maui 8—*Cyanea glabra*—a	.....	*Cyanea glabra*.
Maui 8—*Cyanea hamatiflora* ssp. *hamatiflora*—a	*Cyanea hamatiflora* ssp. *hamatiflora*..	

Unit name	Species occupied	Species unoccupied
Maui 8—*Cyanea mceldowneyi*—a	*Cyanea mceldowneyi*.	
Maui 8—*Diplazium molokaiense*—a	*Diplazium molokaiense*.	
Maui 8—*Geranium multiflorum*—a	.....	*Geranium multiflorum*.
Maui 8—*Melicope balloui*—a	*Melicope balloui*.	
Maui 8—*Phlegmariurus mannii*—a	*Phlegmariurus mannii*.	
Maui 8—*Phyllostegia mannii*—a	.....	*Phyllostegia mannii*.
Maui 8—*Phyllostegia mollis*—a	.....	*Phyllostegia mollis*.
Maui 8—*Zanthoxylum hawaiiense*—a	*Zanthoxylum hawaiiense*.	
Maui 9—*Alectryon macrococcus*—a	.....	*Alectryon macrococcus*.
Maui 9—*Argyroxiphium sandwicense* ssp. *macrocephalum*—a	*Argyroxiphium sandwicense* ssp. *macrocephalum*.	
Maui 9—*Asplenium fragile* var. *insulare*—a	.....	*Asplenium fragile* var.*insulare*.
Maui 9—*Bidens micrantha* ssp. *kalealaha*—a	*Bidens micrantha* ssp. *kalealaha*.	
Maui 9—*Bidens micrantha* ssp. *kalealaha*—b	*Bidens micrantha* ssp. *kalealaha*.	
Maui 9—*Clermontia lindseyana*—a	*Clermontia lindseyana*.	
Maui 9—*Clermontia lindseyana*—b	.....	*Clermontia lindseyana*.
Maui 9—*Clermontia samuelii*—a	*Clermontia samuelii*.	
Maui 9—*Cyanea copelandii* ssp. *haleakalaensis*—b	*Cyanea copelandii* ssp. *haleakalaensis*.	
Maui 9—*Cyanea glabra*—b	.....	*Cyanea glabra*.
Maui 9—*Cyanea glabra*—c	.....	*Cyanea glabra*.
Maui 9—*Cyanea hamatiflora* ssp. *hamatiflora—b*	*Cyanea hamatiflora* ssp. *hamatiflora*.	
Maui 9—*Diellia erecta*—a	.....	*Diellia erecta*.
Maui 9—*Diellia erecta*—b	.....	*Diellia erecta*.
Maui 9—*Diplazium molokaiense*—b	.....	*Diplazium molokaiense*.
Maui 9—*Flueggea neowawraea*—a	*Flueggea neowawraea*.	
Maui 9—*Geranium arboreum*—a	*Geranium arboreum*.	
Maui 9—*Geranium multiflorum*—b	*Geranium multiflorum*.	
Maui 9—*Geranium multiflorum*—c	.....	*Geranium multiflorum*.
Maui 9—*Lipochaeta kamolensis*—a	*Lipochaeta kamolensis*.	
Maui 9—*Melicope balloui*—b	*Melicope balloui*.	
Maui 9—*Melicope knudsenii*—a	*Melicope knudsenii*.	
Maui 9—*Melicope mucronulata*—a	.....	*Melicope mucronulata*.
Maui 9—*Melicope ovalis*—a	*Melicope ovalis*.	
Maui 9—*Neraudia sericea*—a	*Neraudia sericea*.	
Maui 9—*Nototrichium humile*—a	.....	*Nototrichium humile*.
Maui 9—*Phlegmariurus mannii*—b	*Phlegmariurus mannii*.	
Maui 9—*Phlegmariurus mannii*—c	*Phlegmariurus mannii*.	
Maui 9—*Phyllostegia mollis*—b	.....	*Phyllostegia mollis*.
Maui 9—*Plantago princeps*—a	*Plantago princeps*.	
Maui 9—*Platanthera holochila*—a	.....	*Platanthera holochila*.
Maui 9—*Schiedea haleakalensis*—a	*Schiedea haleakalensis*.	
Maui 9—*Schiedea haleakalensis*—b	*Schiedea haleakalensis*.	
Maui 10—*Alectryon macrococcus*—b	.....	*Alectryon macrococcus*.
Maui 11—*Lipochaeta kamolensis*—b	.....	*Lipochaeta kamolensis*.
Maui 12—*Vigna o-wahuensis*—a	*Vigna o-wahuensis*.	
Maui 13—*Alectryon macrococcus*—c	.....	*Alectryon macrococcus*.
Maui 13—*Bonamia menziesii*—a	*Bonamia menziesii*.	
Maui 13—*Cenchrus agrimonioides*—a	*Cenchrus agrimonioides*.	
Maui 13—*Colubrina oppositifolia*—a	.....	*Colubrina oppositifolia*.
Maui 13—*Flueggea neowawraea*—b	.....	*Flueggea neowawraea*.
Maui 13—*Melicope adscendens*—a	*Melicope adscendens*.	
Maui 13—*Melicope knudsenii*—b	.....	*Melicope knudsenii*.
Maui 13—*Melicope mucronulata*—b	.....	*Melicope mucronulata*.
Maui 13—*Sesbania tomentosa*—b	*Sesbania tomentosa*.	
Maui 13—*Spermolepis hawaiiensis*—a	*Spermolepis hawaiiensis*.	
Maui 14—*Geranium arboreum*—b	*Geranium arboreum*.	
Maui 15—*Geranium arboreum*—c	*Geranium arboreum*.	
Maui 16—*Hibiscus brackenridgei*—a	*Hibiscus brackenridgei*.	
Maui 17—*Alectryon macrococcus*—d	.....	*Alectryon macrococcus*.
Maui 17—*Alectryon macrococcus*—e	*Alectryon macrococcus*.	
Maui 17—*Cenchrus agrimonioides*—b	.....	*Cenchrus agrimonioides*.
Maui 17—*Clermontia oblongifolia* ssp. *mauiensis*—a	.....	*Clermontia oblongifolia* ssp. *mauiensis*.
Maui 17—*Clermontia oblongifolia* ssp. *mauiensis*—b	.....	*Clermontia oblongifolia* ssp. *mauiensis*.
Maui 17—*Clermontia oblongifolia* ssp. *mauiensis*—c	*Clermontia oblongifolia* ssp. *mauiensis*.	
Maui 17—*Colubrina oppositifolia*—b	.....	*Colubrina oppositifolia*.
Maui 17—*Ctenitis squamigera*—a	*Ctenitis squamigera*.	
Maui 17—*Ctenitis squamigera*—b	*Ctenitis squamigera*.	
Maui 17—*Ctenitis squamigera*—c	*Ctenitis squamigera*.	
Maui 17—*Cyanea glabra*—d	.....	*Cyanea glabra*.

Unit name	Species occupied	Species unoccupied
Maui 17—*Cyanea glabra*—e	.....	*Cyanea glabra*.
Maui 17—*Cyanea glabra*—f	.....	*Cyanea glabra*.
Maui 17—*Cyanea glabra*—g	*Cyanea glabra*.	
Maui 17—*Cyanea grimesiana* ssp. *grimesiana*—a	*Cyanea grimesiana* ssp. *grimesiana*.	
Maui 17—*Cyanea lobata*—a	*Cyanea lobata*.	
Maui 17—*Cyanea lobata*—b	.....	*Cyanea lobata*.
Maui 17—*Cyanea lobata*—c	.....	*Cyanea lobata*.
Maui 17—*Cyrtandra munroi*—a	.....	*Cyrtandra munroi*.
Maui 17—*Cyrtandra munroi*—b	*Cyrtandra munroi*.	
Maui 17—*Cyrtandra munroi*—c	.....	*Cyrtandra munroi*.
Maui 17—*Diellia erecta*—c	.....	*Diellia erecta*.
Maui 17—*Diellia erecta*—d	*Diellia erecta*.	
Maui 17—*Diellia erecta*—e	*Diellia erecta*.	
Maui 17—*Diellia erecta*—f	*Diellia erecta*.	
Maui 17—*Diplazium molokaiense*—c	.....	*Diplazium molokaiense*.
Maui 17—*Dubautia plantaginea* ssp. *humilis*—a	.....	*Dubautia plantaginea* ssp. *humilis*.
Maui 17—*Dubautia plantaginea* ssp. *humilis*—b	.....	*Dubautia plantaginea* ssp. *humilis*.
Maui 17—*Dubautia plantaginea* ssp. *humilis*—c	*Dubautia plantaginea* ssp. *humilis*.	
Maui 17—*Gouania vitifolia*—a	.....	*Gouania vitifolia*.
Maui 17—*Hedyotis coriacea*—a	*Hedyotis coriacea*.	
Maui 17—*Hedyotis coriacea*—b	.....	*Hedyotis coriacea*.
Maui 17—*Hedyotis mannii*—a	*Hedyotis mannii*.	
Maui 17—*Hesperomannia arbuscula*—a	.....	*Hesperomannia arbuscula*.
Maui 17—*Hesperomannia arbuscula*—b	*Hesperomannia arbuscula*.	
Maui 17—*Hibiscus brackenridgei*—b	*Hibiscus brackenridgei*.	
Maui 17—*Isodendrion pyrifolium*—a	.....	*Isodendrion pyrifolium*.
Maui 17—*Lysimachia lydgatei*—a	*Lysimachia lydgatei*.	
Maui 17—*Lysimachia lydgatei*—b	.....	*Lysimachia lydgatei*.
Maui 17—*Lysimachia lydgatei*—c	.....	*Lysimachia lydgatei*.
Maui 17—*Lysimachia lydgatei*—d	*Lysimachia lydgatei*.	
Maui 17—*Lysimachia lydgatei*—e	*Lysimachia lydgatei*.	
Maui 17—*Neraudia sericea*—b	*Neraudia sericea*.	
Maui 17—*Peucedanum sandwicense*—b	.....	*Peucedanum sandwicense*.
Maui 17—*Phlegmariurus mannii*—d	*Phlegmariurus mannii*.	
Maui 17—*Phlegmariurus mannii*—e	*Phlegmariurus mannii*.	
Maui 17—*Plantago princeps*—b	*Plantago princeps*.	
Maui 17—*Platanthera holochila*—b	*Platanthera holochila*.	
Maui 17—*Platanthera holochila*—c	.....	*Platanthera holochila*.
Maui 17—*Pteris lidgatei*—a	*Pteris lidgatei*.	
Maui 17—*Pteris lidgatei*—b	*Pteris lidgatei*.	
Maui 17—*Remya mauiensis*—a	*Remya mauiensis*.	
Maui 17—*Remya mauiensis*—b	*Remya mauiensis*.	
Maui 17—*Remya mauiensis*—c	.....	*Remya mauiensis*.
Maui 17—*Sanicula purpurea*—a	.....	*Sanicula purpurea*.
Maui 17—*Sanicula purpurea*—b	*Sanicula purpurea*.	
Maui 17—*Sanicula purpurea*—c	*Sanicula purpurea*.	
Maui 17—*Spermolepis hawaiiensis*—b	*Spermolepis hawaiiensis*.	
Maui 17—*Tetramolopium capillare*—a	*Tetramolopium capillare*.	
Maui 17—*Tetramolopium remyi*—a	.....	*Tetramolopium remyi*.
Maui 18—*Alectryon macrococcus*—f	.....	*Alectryon macrococcus*.
Maui 18—*Colubrina oppositifolia*—c	*Colubrina oppositifolia*.	
Maui 18—*Ctenitis squamigera*—d	.....	*Ctenitis squamigera*.
Maui 18—*Remya mauiensis*—d	.....	*Remya mauiensis*.

(cxxxix) Critical habitat unit descriptions and maps, and a description of primary constituent elements, for Family Rhamnaceae: *Gouania hillebrandi* on the island of Maui is provided in 50 CFR 17.96(a).

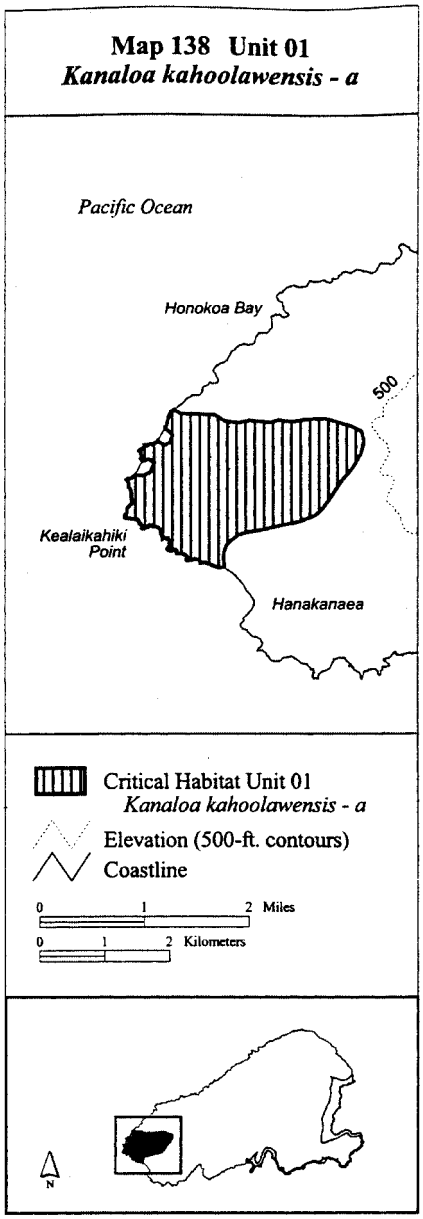
(2) *Kahoolawe.* Critical habitat units are described below. Coordinates in UTM Zone 4 with units in meters using North American Datum of 1983 (NAD83).

(i) Kahoolawe 1—*Kanaloa kahoolawensis*—a (62 ha; 1,388 ac).

(A) Unit consists of the following 53 boundary points and the intermediate coastline: 741288, 2270367; 739913, 2271787; 739924, 2271802; 740037, 2271790; 740156, 2271842; 740226, 2271995; 740142, 2272051; 740036, 2272014; 740031, 2272022; 740031, 2272025; 740030, 2272030; 740266, 2272329; 740273, 2272338; 740375, 2272265; 740467, 2272316; 740500, 2272422; 740407, 2272520; 740392, 2272537; 740396, 2272546; 740401, 2272558; 740521, 2272815; 740529, 2272822; 740631, 2272765; 741148, 2272741; 741302, 2272644; 741524, 2272620; 741689, 2272648; 742016, 2272620; 742142, 2272660; 742340, 2272628; 742578, 2272668; 742844, 2272680; 743224, 2272571; 743406, 2272470; 743438, 2272325; 743389, 2272115; 743244, 2271885; 743103, 2271711; 742901, 2271404; 742784, 2271259; 742687, 2271170; 742453, 2271077; 742344, 2271053; 742190, 2271025; 741883, 2270952; 741673, 2270912; 741508, 2270875; 741415, 2270795; 741326, 2270714; 741290, 2270597; 741282, 2270508; 741286, 2270423; 741288, 2270367; return to starting point.

(B) **Note:** Map 138 follows :

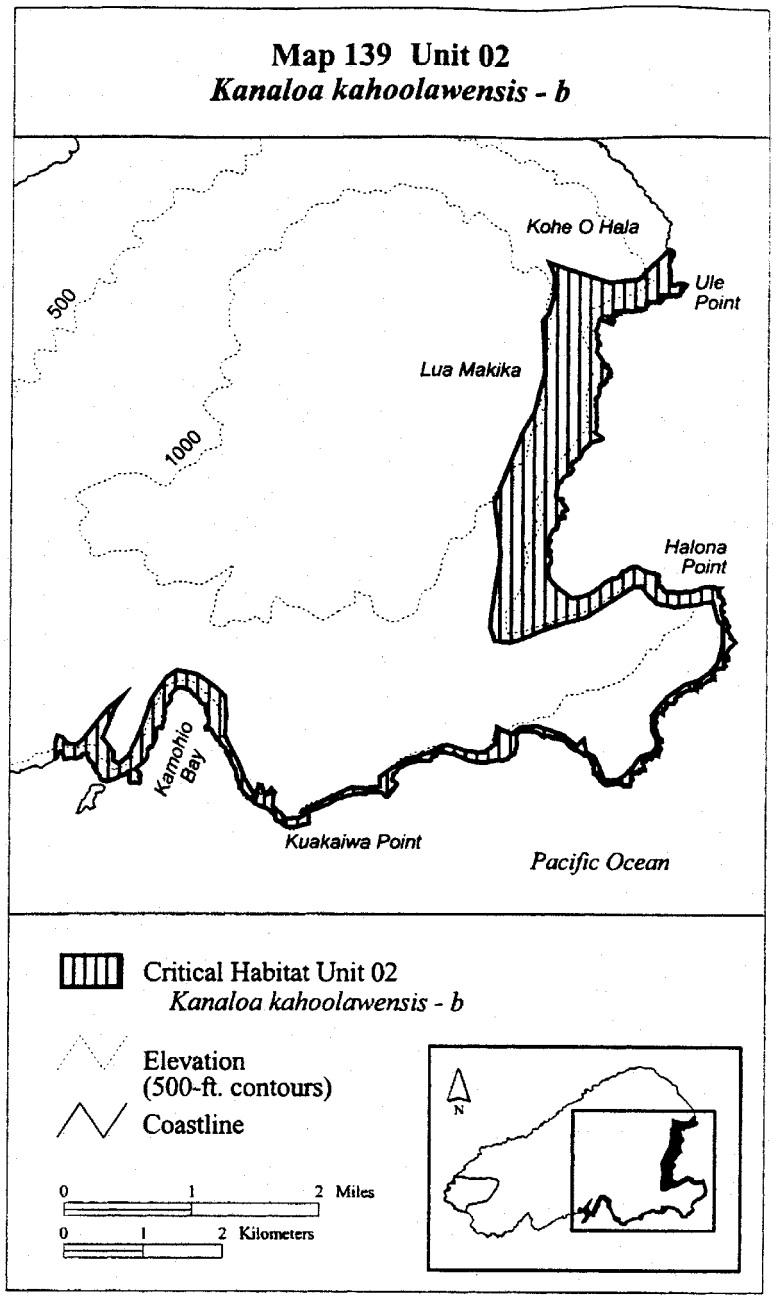
BILLING CODE 4310–55–P



(ii) Kahoolawe 2—*Kanaloa kahoolawensis*—b (613 ha; 1,516 ac).

(A) Unit consists of the following 131 boundary points and the intermediate coastline: 756526, 2276870; 756534, 2276893; 748810, 2270407; 748804, 2270414; 748801, 2270602; 748829, 2270694; 748896, 2270675; 748956, 2270592; 749080, 2270581; 749149, 2270650; 749452, 2271037; 749659, 2271200; 749547, 2271037; 749432, 2270760; 749397, 2270670; 749534, 2270492; 749529, 2270389; 749599, 2270339; 749724, 2270439; 749837, 2270680; 749914, 2270865; 749962, 2271002; 750002, 2271142; 750187, 2271420; 750335, 2271525; 750605, 2271469; 750812, 2271310; 750943, 2271192; 750958, 2270952; 750945, 2270692; 751093, 2270402; 751195, 2270154; 751278, 2270019; 751272, 2270015; 751343, 2269909; 751373, 2270074; 751419, 2270068; 751438, 2269987; 751483, 2269952; 751538, 2270023; 751576, 2269978; 751565, 2269934; 751553, 2269794; 751670, 2269694; 751700, 2269639; 751893, 2269652; 751933, 2269679; 751928, 2269742; 752308, 2269927; 752533, 2270032; 752756, 2270029; 752909, 2270054; 752896, 2270169; 753054, 2270282; 753219, 2270392; 753537, 2270482; 753667, 2270557; 753667, 2270551; 753757, 2270587; 754009, 2270497; 754207, 2270480; 754355, 2270585; 754382, 2270807; 754562, 2270710; 754677, 2270807; 754877, 2270822; 755212, 2270710; 755390, 2270580; 755480, 2270660; 755510, 2270495; 755605, 2270439; 755680, 2270285; 755747, 2270135; 755897, 2270132; 755995, 2270202; 756108, 2270312; 756168, 2270405; 756226, 2270450; 756341, 2270495; 756393, 2270550; 756401, 2270645; 756338, 2270782; 756333, 2270950; 756408, 2271057; 756523, 2271185; 756716, 2271328; 756763, 2271353; 756916, 2271408; 757056, 2271503; 757164, 2271635; 757209, 2271808; 757224, 2271970; 757214, 2271970; 757214, 2272116; 757154, 2272171; 757116, 2272326; 757101, 2272408; 756891, 2272366; 756608, 2272333; 756386, 2272378; 756271, 2272488; 756198, 2272593; 756078, 2272571; 755795, 2272388; 755508, 2272205; 755210, 2272115; 754942, 2272025; 754947, 2272036; 754785, 2271960; 754550, 2271868; 754339, 2271898; 754289, 2272068; 754297, 2272223; 754327, 2272463; 754339, 2272518; 754412, 2273006; 754327, 2273668; 754665, 2274523; 754833, 2274812; 754954, 2275312; 754948, 2275650; 754918, 2275963; 755008, 2276059; 755062, 2276282; 755068, 2276565; 755008, 2276710; 755767, 2276457; 756140, 2276495; 756363, 2276718; 756518, 2276871; 756526, 2276870; return to starting point.

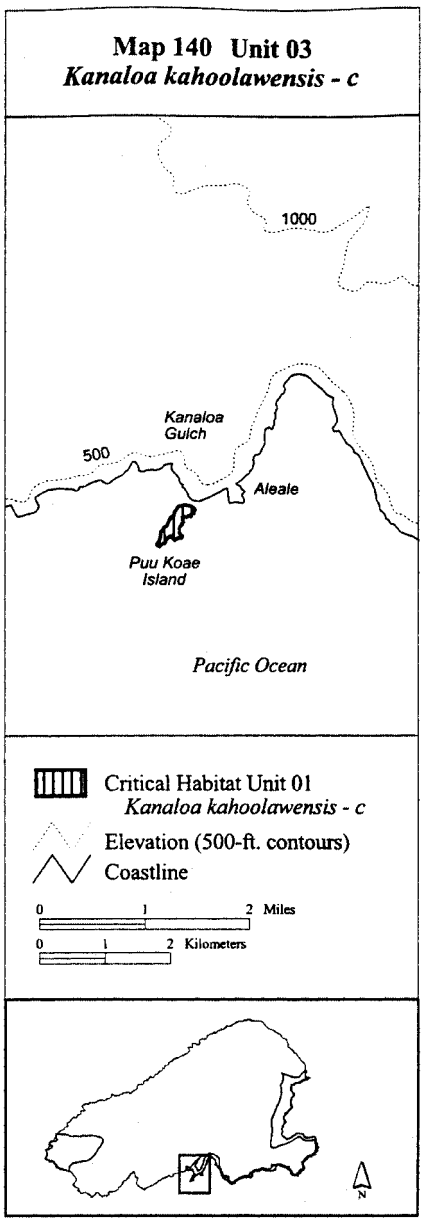
(B) **Note:** Map 139 follows:



(iii) Kahoolawe 3—*Kanaloa kahoolawensis*—c (5 ha; 12 ac).

(A) Unit consists of the entire offshore island located at approximately: 749231, 2269900.

(B) **Note:** Map 140 follows:



BILLING CODE 4310–55–C

(iv) Table of Protected Species Within Each Critical Habitat Unit for Kahoolawe

Unit name	Species occupied	Species unoccupied
Kahoolawe 1—*Kanaloa kahoolawensis*—a	.....	*Kanaloa kahoolawensis.*
Kahoolawe 2—*Kanaloa kahoolawensis*—b	*Kanaloa kahoolawensis.*	
Kahoolawe 3—*Kanaloa kahoolawensis*—c	.....	*Kanaloa kahoolawensis.*

(f) *Plants on Maui and Kahoolawe; Constituent elements.*

(1) *Flowering Plants.*

Family Amaranthaceae: *Nototrichium humile* (kului)

Maui 9—*Nototrichium humile*—a, identified in the legal description in paragraph (e)(1) of this section, constitutes critical habitat for *Nototrichium humile* on Maui. Within this unit, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Old cinder cones in dry shrubland containing one or more of the following associated native species: *Dodonaea viscosa, Erythrina sandwicensis, Heteropogon contortus,* or *Nototrichium sandwicense;* and

(ii) Elevations between 338 and 734 m (1,110 and 2,407 ft).

Family Apiaceae: *Peucedanum sandwicense* (makou)

Maui 4—*Peucedanum sandwicense*—a and Maui 17—*Peucedanum sandwicense*—b, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Peucedanum sandwicense* on Maui. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Sparsely vegetated steep to vertical cliff habitats with little soil in mesic or coastal communities and containing one or more of the following associated native species: *Artemisia australis, Bidens* spp., *Carex* spp., *Chamaesyce* spp., *Diospyros sandwicensis, Eragrostis* spp., *Hedyotis littoralis, Lysimachia mauritiana, Metrosideros polymorpha, Pandanus tectorius, Peperomia* spp., *Scaevola taccada,* or *Schiedea globosa;* and

(ii) Elevations between 0 and 1,132 m (0 and 3,714 ft).

Family Apiaceae: *Sanicula purpurea* (NCN)

Maui 17—*Sanicula purpurea*—a, Maui 17—*Sanicula purpurea*—b, and Maui 17—*Sanicula purpurea*—c, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Sanicula purpurea* on Maui. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Open *Metrosideros polymorpha* mixed montane bogs and containing one or more of the following associated native plant taxa: *Argyroxiphium caliginis, Argyroxiphium grayanum, Gahnia beecheyi, Geranium hillebrandii, Lagenifera maviensis, Leptecophylla tameiameiae, Lycopodium* sp., *Machaerina* sp., *Myrsine vaccinioides, Oreobolus furcatus, Plantago pachyphylla,* or *Viola maviensis;* and

(ii) Elevations between 1,195 and 1,761 m (3,921 and 5,778 ft).

Family Apiaceae: *Spermolepis hawaiiensis* (NCN)

Maui 13—*Spermolepis hawaiiensis*—a, and Maui 17—*Spermolepis hawaiiensis*—b, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Spermolepis hawaiiensis* on Maui. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Shady spots in *Dodonaea viscosa* lowland dry shrubland and containing one or more of the following associated native species: *Diospyros* sp., *Eragrostis variabilis, Erythrina sandwicensis, Gouania hillebrandii, Heteropogon contortus, Melanthera lavarum, Myoporum sandwicense, Pleomele* sp., *Santalum ellipticum, Sida fallax,* or *Wikstroemia* sp.; and

(ii) Elevations between 221 and 742 m (725 and 2,434 ft).

Family Asteraceae: *Argyroxiphium sandwicense* ssp. *macrocephalum* (ahinahina)

Maui 9—*Argyroxiphium sandwicense* ssp. *macrocephalum*—a, identified in the legal description in paragraph (e)(1) of this section, constitutes critical habitat for *Argyroxiphium sandwicense* ssp. *macrocephalum* on Maui. Within this unit, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Lava flows and otherwise barren, unstable slopes of recent (less than several thousand years old) volcanic cinder cones, or *Deschampsia* grasslands; or a mean annual precipitation of approximately 75 to 250 cm (29.6 to 98.4 in); or substrate with almost no soil development and subject to frequent formation of ice at night and extreme heating during cloudless days; or alpine dry shrubland; and the presence of one or more of the following associated native plant species: *Agrostis sandwicensis, Deschampsia nubigena, Dubautia menziesii, Leptecophylla tameiameiae, Silene struthioloides, Tetramolopium humile,* or *Trisetum glomeratum;* and

(ii) Elevations between 1,508 and 3,053 m (4,947 and 10,016 ft).

Family Asteraceae: *Bidens micrantha* ssp. *kalealaha* (kookoolau)

Maui 9—*Bidens micrantha* ssp. *kalealaha*—a and Maui 9—*Bidens micrantha* ssp. kalealaha—b, identified in the legal descriptions in paragraph (e)(1) 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 include, but are not limited to, the habitat components provided by:

(i) Blocky lava flows with little or no soil development, or deep pit craters, or sheer rock walls in open canopy *Metrosideros polymorpha-Acacia koa* forest; montane shrubland; *Sophora chrysophylla* forest or cliff face, and the presence of one or more of the following associated native plant species: *Coprosma montana, Dodonaea viscosa, Dubautia menziesii, Dubautia platyphylla, Leptecophylla tameiameiae, Santalum haleakalae,* or *Vaccinium reticulatum;* and

(ii) Elevations between 1,317 and 2,565 m (4,321 and 8,414 ft).

Family Asteraceae: *Dubautia plantaginea* ssp. *humilis* (naenae)

Maui 17—*Dubautia plantaginea* ssp. *humilis*—a, Maui 17—*Dubautia plantaginea* ssp. *humilis*—b, and Maui 17—*Dubautia plantaginea* ssp. *humilis*—c, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Dubautia plantaginea* ssp. *humilis* on Maui. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Wet, barren, steep, rocky, wind-blown cliffs containing one or more of the following associated native plant species: *Bidens* sp., *Carex* sp., *Eragrostis variabilis, Hedyotis formosa, Lysimachia remyi, Metrosideros polymorpha, Pipturus albidus, Plantago princeps,* or *Pritchardia* sp.; and

(ii) Elevations between 291 and 1,593 m (955 and 5,226 ft).

Family Asteraceae: *Hesperomannia arbuscula* (NCN)

Maui 17—*Hesperomannia arbuscula*—a and Maui 17—*Hesperomannia arbuscula*—b, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Hesperomannia arbuscula* on Maui. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Steep forested slopes and ridges in mesic forest dominated by *Metrosideros polymorpha* or *Diospyros sandwicensis* and containing one or more of the following associated native plant species: *Alyxia oliviformis, Bidens* sp., *Cheirodendron* sp., *Clermontia* sp., *Cyanea* sp., *Psychotria* sp., or *Tetraplasandra* sp.; and

(ii) Elevations between 412 and 1,422 m (1,352 and 4,665 ft).

Family Asteraceae: *Lipochaeta kamolensis* (nehe)

Maui 9—*Lipochaeta kamolensis*—a and Maui 11—*Lipochaeta kamolensis*—b, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Lipochaeta kamolensis* on Maui. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Gulches or gentle slopes outside gulches in dry shrubland and containing one or more of the following associated native plant species: *Dodonaea viscosa, Ipomoea indica*, or *Plumbago zeylanica*; and

(ii) Elevations between 40 and 602 m (132 and 1,974 ft).

Family Asteraceae: *Remya mauiensis* (NCN)

Maui 17—*Remya mauiensis*—a, Maui 17—*Remya mauiensis*—b, Maui 17—*Remya mauiensis*—c, and Maui 18—*Remya mauiensis*—d, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Remya mauiensis* on Maui. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Steep, north or northeast-facing slopes in mixed mesophytic forests or *Metrosideros polymorpha* montane wet forests and containing one or more of the following associated native species: *Alyxia oliviformis, Diospyros sandwicensis, Diplazium sandwichianum, Dodonaea viscosa, Leptecophylla tameiameiae, Lysimachia remyi, Melicope* sp., *Microlepia strigosa, Myrsine lessertiana, Nestegis sandwicensis, Pleomele auwahiensis, Psychotria mariniana, Wikstroemia* sp., or *Xylosma hawaiiense;* and

(ii) Elevations between 435 and 1,228 m (1,427 and 4,029 ft).

Family Asteraceae: *Tetramolopium capillare* (pamakani)

Maui 17—*Tetramolopium capillare*—a, identified in the legal description in paragraph (e)(1) of this section, constitutes critical habitat for *Tetramolopium capillare* on Maui. Within this unit, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Rocky substrates in *Heteropogon contortus* lowland dry forest or in *Metrosideros polymorpha-Leptecophylla tameiameiae* montane mesic or wet shrubland and wet cliff faces and containing one or more of the following associated plant species: *Dodonaea viscosa* or *Myoporum sandwicense;* and

(ii) Elevations between 155 and 1,432 m (509 and 4,698 ft).

Family Asteraceae: *Tetramolopium remyi* (NCN)

Maui 17—*Tetramolopium remyi*—a, identified in the legal description in paragraph (e)(1) of this section, constitutes critical habitat for *Tetramolopium remyi* on Maui. Within this unit, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Dry, exposed ridges or flats in lowland dry shrubland and containing one or more of the following associated native plant species: *Bidens mauiensis, Bidens menziesii, Dodonaea viscosa, Eragrostis atropioides, Heteropogon contortus, Lipochaeta heterophylla,* or *Waltheria indica;* and

(ii) Elevations between 85 and 550 m (279 and 1,804 ft).

Family Campanulaceae: *Brighamia rockii* (pua ala)

Maui 2—*Brighamia rockii*—a, Maui 2—*Brighamia rockii*—b, Maui 3—*Brighamia rockii*—c, Maui 4—*Brighamia rockii*—d, and Maui 5—*Brighamia rockii*—e, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Brighamia rockii* on Maui. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Steep sea cliffs, often within the spray zone, in coastal dry to mesic forests and shrublands and containing one or more of the following associated plant species: *Diospyros sandwicensis, Osteomeles anthyllidifolia, Psydrax odorata,* or *Scaevola taccada;* and

(ii) Elevations between 0 and 146 m (0 and 479 ft).

Family Campanulaceae: *Clermontia lindseyana* (haha)

Maui 9—*Clermontia lindseyana*—a and Maui 9—*Clermontia lindseyana*—b, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Clermontia lindseyana* on Maui. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) *Acacia koa* mesic forest containing one or more of the following associated native plant species: *Coprosma* sp., *Cyrtandra* spp., *Ilex anomala, Myrsine* sp., or native fern species; and

(ii) Elevations between 1,147 and 1,868 m (3,762 and 6,129 ft).

Family Campanulaceae: *Clermontia oblongifolia* ssp. *mauiensis* (oha eai)

Maui 17—*Clermontia oblongifolia* ssp. *mauiensis*—a, Maui 17—*Clermontia oblongifolia* ssp. *mauiensis*—b, and Maui 17—*Clermontia oblongifolia* ssp. *mauiensis*—c, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Clermontia oblongifolia* ssp. *mauiensis* on Maui. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) The sides and tops of ridges in *Metrosideros polymorpha*-dominated montane wet forest and containing one or more of the following associated native plant species: *Cheirodendron* sp., *Clermontia* sp., *Coprosma* sp., *Dicranopteris linearis, Hedyotis* sp., *Ilex anomala, Melicope* sp., or *Myrsine* sp.; and

(ii) Elevations between 539 and 1,738 m (1,768 and 5,702 ft).

Family Campanulaceae: *Clermontia samuelii* (oha wai)

Maui 9—*Clermontia samuelii*—a, identified in the legal description in paragraph (e)(1) of this section, constitutes critical habitat for *Clermontia samuelii* on Maui. Within this unit, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Wet *Metrosideros polymorpha* and *M. polymorpha-Dicranopteris linearis* forest or wet *M. polymorpha* and *M. polymorpha-Cheirodendron trigynum* forest containing one or more of the following associated native plant species: *Adenophorus tamariscinus, Broussaisia arguta, Carex alligata, Cibotium* spp., *Clermontia arborescens* ssp. *waihiae, Clermontia* sp., *Diplazium sandwichianum, Dubautia* sp., *Hedyotis hillebrandii, Hedyotis terminalis, Hedyotis* sp., *Melicope clusiifolia, Melicope* spp., *Peperomia obovatilimba, Psychotria mariniana, Rubus hawaiiensis, Tetraplasandra oahuensis,* or *Vaccinium* spp.; and

(ii) Elevations between 724 and 2,244 m (2,375 and 7,362 ft).

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

Maui 8—*Cyanea copelandii* ssp. *haleakalaensis*—a and Maui 9—*Cyanea copelandii* ssp. *haleakalaensis*—b, identified in the legal descriptions in paragraph (e)(1) 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 include, but are not limited to, the habitat components provided by:

(i) Stream banks or wet scree slopes or forest understory in montane wet or mesic forest dominated by *Acacia koa* and/or *Metrosideros polymorpha* and containing one or more of the following associated native plant species: *Broussaisia arguta, Cibotium* sp.,

Hedyotis acuminata, Perrottetia sandwicensis, or *Psychotria hawaiiensis;* and

(ii) Elevations between 616 and 1,411 m (2,021 and 4,630 ft).

Family Campanulaceae: *Cyanea glabra* (haha)

Maui 8—*Cyanea glabra*—a, Maui 9—*Cyanea glabra*—b, Maui 9—*Cyanea glabra*—c, Maui 17—*Cyanea glabra*—d, Maui 17—*Cyanea glabra*—e, Maui 17—*Cyanea glabra*—f, and Maui 17—*Cyanea glabra*—g, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Cyanea glabra* on Maui. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Soil and rock stream banks in wet lowland forest dominated by *Acacia koa* and/or *Metrosideros polymorpha* and containing one or more of the following associated native plant species: *Boehmeria grandis, Cheirodendron trigynum, Christella cyatheoides, Cibotium* sp., *Clermontia kakeana, Coprosma* sp., *Cyanea elliptica, Diplazium* sp., *Dodonaea viscosa, Dubautia plantaginea, Perrottetia sandwicensis, Pipturus albidus, Psychotria* sp., *Sadleria* sp., *Touchardia latifolia,* or *Xylosma hawaiiense* or; and

(ii) Elevations between 413 and 1,569 m (1,355 and 5,149 ft).

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

Maui 17—*Cyanea grimesiana* ssp. *grimesiana*—a, identified in the legal description in paragraph (e)(1) 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 include, but are not limited to, the habitat components provided by:

(i) Rocky or steep slopes of stream banks in wet forest gulch bottoms often dominated by *Metrosideros polymorpha* and containing one or more of the following associated native plant species: *Antidesma* sp., *Bobea* sp., *Myrsine* sp., *Nestegis sandwicensis, Psychotria* sp., or *Xylosma* sp.; and

(ii) Elevations between 312 and 1,617 m (1,024 and 5,305 ft).

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

Maui 8—*Cyanea hamatiflora* ssp. *hamatiflora*—a and Maui 9—*Cyanea hamatiflora* ssp. *hamatiflora*—b, identified in the legal descriptions in paragraph (e)(1) 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 include, but are not limited to, the habitat components provided by:

(i) 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: *Athyrium microphyllum, Broussaisia arguta, Cheirodendron trigynum, Cyanea aculeatiflora, Cyanea kunthiana, Dicranopteris linearis, Diplazium sandwichianum, Melicope* sp., *Myrsine* sp., or *Vaccinium* sp.; and

(ii) Elevations between 767 and 1,553 m (2,515 and 5,095 ft).

Family Campanulaceae: *Cyanea lobata* (haha)

Maui 17—*Cyanea lobata*—a, Maui 17—*Cyanea lobata*—b, and Maui 17—*Cyanea lobata*—c, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Cyanea lobata* on Maui. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Steep stream banks in deep shade in wet forest and containing one or more of the following associated native plant species: *Antidesma* sp., *Athyrium* sp., *Clermontia kakeana, Cyrtandra* spp., *Freycinetia arborea, Metrosideros polymorpha, Morinda trimera, Peperomia* sp., *Pipturus albidus, Pleomele* sp., *Psychotria* sp., *Touchardia latifolia,* or *Xylosma* sp.; and

(ii) Elevations between 260 and 1,530 m (853 and 5,020 ft).

Family Campanulaceae: *Cyanea mceldowneyi* (haha)

Maui 8—*Cyanea mceldowneyi*—a, identified in the legal description in paragraph (e)(1) of this section, constitutes critical habitat for *Cyanea mceldowneyi* on Maui. Within this unit, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Montane wet and mesic forest with mixed *Metrosideros polymorpha-Acacia koa* and containing one or more of the following associated native plant species: *Broussaisia arguta, Cheirodendron trigynum, Cibotium* sp., *Clermontia arborescens, Cyrtandra* sp., *Dicranopteris linearis, Diplazium sandwichianum, Hedyotis* sp., or *Melicope clusiifolia;* and

(ii) Elevations between 837 and 1,348 m (2,745 and 4,423 ft).

Family Caryophyllaceae: *Schiedea haleakalensis* (NCN)

Maui 9—*Schiedea haleakalensis*—a and Maui 9—*Schiedea haleakalensis*—b, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Schiedea haleakalensis* on Maui. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Rock cracks on sheer cliffs adjacent to barren lava and subalpine shrublands; or grasslands with cinder, or weathered volcanic ash, or bare lava substrate with little or no soil development and periodic freezing temperatures; and containing one or more of the following associated native plant species: *Artemisia mauiensis, Bidens micrantha, Dubautia menziesii, Leptecophylla tameiameiae, Vaccinium reticulatum,* or *Viola chamissoniana;* and

(ii) Elevations between 1,678 and 2,434 m (5,505 and 7,986 ft).

Family Convolvulaceae: *Bonamia menziesii* (NCN)

Maui 13—*Bonamia menziesii*—a, identified in the legal description in paragraph (e)(1) of this section, constitutes critical habitat for *Bonamia menziesii* on Maui. Within this unit, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Aa lava in mixed open dry forest or *Erythrina sandwicensis* lowland dry forest, or in mesic mixed *Metrosideros polymorpha* forest and containing one or more of the following associated native plant species: *Acacia koaia, Achyranthes splendens, Alphitonia ponderosa, Alyxia oliviformis, Diospyros sandwicensis, Dodonaea viscosa, Lipochaeta rockii, Myoporum sandwicense, Nestegis sandwicensis, Nothocestrum latifolium, Nototrichium* sp., *Osteomeles anthyllidifolia, Pleomele auwahiensis, Pouteria sandwicensis, Reynoldsia sandwicensis, Santalum ellipticum, Sicyos* sp., *Sida fallax,* or *Xylosma hawaiiensis;* and

(ii) Elevations between 221 and 836 m (725 and 2,743 ft).

Family Cyperaceae: *Mariscus pennatiformis* (NCN)

Maui 6—*Mariscus pennatiformis*—a, identified in the legal description in paragraph (e)(1) of this section, constitutes critical habitat for *Mariscus pennatiformis* on Maui. Within this

unit, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Cliffs with brown soil and talus within reach of ocean spray in *Pandanus tectorius* coastal wet forests and containing one or more of the following associated native plant species: *Cyperus laevigatus, Eragrostis* spp., *Ipomoea* sp., *Lysimachia mauritiana,* or *Sadleria pallida;* and

(ii) Elevations between 0 and 134 m (0 and 440 ft).

Family Euphorbiaceae: *Flueggea neowawraea* (mehamehame)

Maui 9—*Flueggea neowawraea*—a and Maui 13—*Flueggea neowawraea*—b, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Flueggea neowawraea* on Maui. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Dry or mesic forest containing one or more of the following associated native plant species: *Alectryon macrococcus, Antidesma pulvinatum, Bobea timonioides, Charpentiera* sp., *Diospyros* sp., *Diplazium sandwichianum, Myrsine lanaiensis, Nesoluma polynesicum, Nestegis sandwicensis, Pleomele auwahiensis, Pleomele* sp., *Pouteria sandwicensis, Psydrax odorata, Rauvolfia sandwicensis,* or *Tetraplasandra* sp.; and

(ii) Elevations between 633 and 971 m (2,078 and 3,186 ft).

Family Fabaceae: *Kanaloa kahoolawensis* (kohe malama malama o Kanaloa)

Kahoolawe 1— *Kanaloa kahoolawensis*—a, Kahoolawe 2—*Kanaloa kahoolawensis*—b, and Kahoolawe 3—*Kanaloa kahoolawensis*—c, identified in the legal descriptions in paragraph (e)(2) of this section, constitute critical habitat for *Kanaloa kahoolawensis* on Kahoolawe. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Steep, rocky talus slopes in mixed coastal shrubland and containing one or more of the following associated native plants: *Bidens mauiensis, Capparis sandwichiana, Melanthera lavarum, Portulaca molokiniensis, Senna gaudichaudii,* or *Sida fallax;* and

(ii) Elevations between 0 and 305 m (0 and 1,000 ft).

Family Fabaceae: *Sesbania tomentosa* (ohai)

Maui 1—*Sesbania tomentosa*—a and Maui 13—*Sesbania tomentosa*—b, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Sesbania tomentosa* on Maui. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Windswept slopes, sea cliffs, and cinder cones in *Scaevola taccada* coastal dry shrublands and containing one or more of the following associated native plant species: *Bidens* sp., *Diospyros sandwicensis, Dodonaea viscosa, Jacquemontia ovalifolia* ssp. *sandwicensis, Melanthera integrifolia,* or *Sida fallax;* and

(ii) Elevations between 0 and 542 m (0 and 1,778 ft).

Family Fabaceae: *Vigna o-wahuensis* (NCN)

Maui 12—*Vigna o-wahuensis*—a, identified in the legal description in paragraph (e)(1) of this section, constitutes critical habitat for *Vigna o-wahuensis* on Maui. Within this unit, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Dry or mesic grassland or shrubland containing one or more of the following associated plant species: *Chamaesyce* sp., or *Dodonaea viscosa;* and

(ii) Elevations between 0 and 50 m (0 and 164 ft).

Family Gentianaceae: *Centaurium sebaeoides* (awiwi)

Maui 1—*Centaurium sebaeoides*—a and Maui 2—*Centaurium sebaeoides*—b, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Centaurium sebaeoides* on Maui. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Volcanic or clay soils or cliffs, in windward coastal areas, containing one or more of the following associated native plant species: *Bidens mauiensis, Lycium sandwicense, Melanthera integrifolia, Panicum torridum, Lysimachia mauritiana, Scaevola taccada,* or *Schiedea globosa;* and

(ii) Elevations between 0 and 129 m (0 and 423 ft).

Family Geraniaceae: *Geranium arboreum* (nohoanu)

Maui 9—*Geranium arboreum*—a, Maui 14—*Geranium arboreum*—b, and Maui 15—*Geranium arboreum*—c, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Geranium arboreum* on Maui. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Steep, damp and shaded narrow canyons and gulches, steep banks, and intermittent streams in *Sophora chrysophylla* subalpine dry shrubland or *Metrosideros polymorpha* montane forest and containing one or more of the following associated native plant species: *Dodonaea viscosa, Dryopteris wallichiana, Leptecophylla tameiameiae, Rubus hawaiiensis,* or *Vaccinium reticulatum;* and

(ii) Elevations between 1,472 and 2,184 m (4,830 and 7,164 ft).

Family Geraniaceae: *Geranium multiflorum* (nohoanu)

Maui 8—*Geranium multiflorum*—a, Maui 9—*Geranium multiflorum*—b, and Maui 9—*Geranium multiflorum*—c, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Geranium multiflorum* on Maui. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Wet or mesic *Metrosideros polymorpha* montane forest or alpine mesic forest, *Leptecophylla tameiameiae* shrubland, *Sophora chrysophylla* subalpine dry forest, open sedge swamps, fog-swept lava flows, or montane grasslands and containing one or more of the following associated native plant species: *Coprosma montana, Dryopteris glabra, Dryopteris wallichiana, Hedyotis* sp., *Leptecophylla tameiameiae Metrosideros polymorpha, Rubus hawaiiensis, Sadleria cyatheoides,* or *Vaccinium* sp.; and

(ii) Elevations between 1,538 and 2,710 m (5,045 and 8,890 ft).

Family Gesneriaceae: *Cyrtandra munroi* (haiwale)

Maui 17—*Cyrtandra munroi*—a, Maui 17—*Cyrtandra munroi*—b, and Maui 17—*Cyrtandra munroi*—c, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Cyrtandra munroi* on Maui. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Rich, moist to wet, moderately steep talus slopes in lowland wet *Metrosideros polymorpha* forest and containing one or more of the following associated native plant species: *Alyxia oliviformis, Bobea* sp., *Clermontia* sp., *Coprosma* sp., *Cyrtandra* spp., *Diospyros* sp., *Freycinetia arborea, Hedyotis acuminata, Melicope* sp., *Myrsine* sp., *Perrottetia sandwicensis, Pipturus* sp., *Pittosporum* sp., *Pouteria sandwicensis, Psychotria* sp., *Sadleria* sp., *Scaevola* sp., *Sicyos* sp., *Strongylodon ruber, Xylosma* sp., or *Zanthoxylum kauense;* and

(ii) Elevations between 468 and 1,108 m (1,535 and 3,635 ft).

Family Lamiaceae: *Phyllostegia mannii* (NCN)

Maui 8—*Phyllostegia mannii*—a, identified in the legal description in paragraph (e)(1) of this section, constitutes critical habitat for *Phyllostegia mannii* on Maui. Within this unit, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Gentle slopes and the steep sides of gulches in mesic to wet forest dominated by *Acacia koa* and/or *Metrosideros polymorpha* and containing one or more of the following associated native plant species: *Alyxia oliviformis, Cheirodendron trigynum, Dicranopteris linearis, Diplazium sandwichianum, Melicope* spp., or *Myrsine lessertiana;* and

(ii) Elevations between 1,069 and 1,348 m (3,506 and 4,421 ft).

Family Lamiaceae: *Phyllostegia mollis* (NCN)

Maui 8—*Phyllostegia mollis*—a and Maui 9—*Phyllostegia mollis*—b, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Phyllostegia mollis* on Maui. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Steep slopes and gulches in mesic forest dominated by *Metrosideros polymorpha* and/or *Acacia koa* and containing one or more of the following associated native plant species: *Alyxia oliviformis, Cheirodendron trigynum, Diplazium sandwichianum, Melicope* spp., or *Myrsine lessertiana;* and

(ii) Elevations between 1,164 and 1,878 m (3,818 and 6,161 ft).

Family Malvaceae: *Hibiscus brackenridgei* (mao hau hele)

Maui 16—*Hibiscus brackenridgei*—a and Maui 17—*Hibiscus brackenridgei*—b, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Hibiscus brackenridgei* on Maui. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Lowland dry forest sometimes with *Erythrina sandwicensis* as the dominant tree containing one or more of the following associated native plant species: *Achyranthes* sp., *Chamaesyce celastroides* var. *lorifolia, Chenopodium* sp., *Diospyros* sp., *Dodonaea viscosa, Melanthera lavarum, Myoporum sandwicense, Nototrichium* sp., annual *Panicum* spp., *Psydrax odorata, Schiedea salicaria,* or *Sida fallax;* and

(ii) Elevations between 85 and 771 m (279 and 2,530 ft).

Family Orchidaceae: *Platanthera holochila* (NCN)

Maui 9—*Platanthera holochila*—a, Maui 17—*Platanthera holochila*—b, and Maui 17—*Platanthera holochila*—c, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Platanthera holochila* on Maui. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) *Metrosideros polymorpha-Dicranopteris linearis* montane wet forest, *M. polymorpha* mixed montane bog, or mesic scrubby *M. polymorpha* forest and containing one or more of the following associated native plant species: *Broussaisia arguta, Cibotium* sp., *Clermontia* sp., *Coprosma ernodeoides, Deschampsia nubigena, Dubautia scabra, Gahnia gahniiformis, Leptecophylla tameiameiae, Luzula hawaiiensis, Lycopodiella cernua, Oreobolus furcatus, Polypodium pellucidum, Sadleria* sp., *Scaevola chamissoniana, Sisyrinchium acre, Vaccinium reticulatum,* or *Wikstroemia* sp.; and

(ii) Elevations between 669 and 2,314 m (2,195 and 7,592 ft).

Family Plantaginaceae: *Plantago princeps* (laukahi kuahiwi)

Maui 9—*Plantago princeps*—a and Maui 17—*Plantago princeps*—b, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Plantago princeps* on Maui. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Basalt cliffs that are windblown with little vegetation in *Metrosideros polymorpha* lowland wet forest, *Acacia koa-M. polymorpha* montane wet forest, or *M. polymorpha* montane wet shrubland and containing one or more of the following associated native plant species: *Bidens micrantha* ssp. *kalealaha, Chamaesyce celastroides, Cyanea* spp., *Dryopteris* sp., *Dubautia menziesii, Dubautia plantaginea* ssp. *humilis, Eragrostis variabilis, Hedyotis formosa, Leptecophylla tameiameiae, Melicope ovalis, Perrottetia sandwicensis, Pipturus albidus,* or *Touchardia latifolia;* and

(ii) Elevations between 281 and 2,460 m (922 and 8,070 ft).

Family Poaceae: *Cenchrus agrimonioides* (kamanomano (= sandbur, agrimony))

Maui 13—*Cenchrus agrimonioides*—a, and Maui 17—*Cenchrus agrimonioides*—b, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Cenchrus agrimonioides* on Maui. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Dry forest or *Pleomele* sp.-*Diospyros* sp. forest and containing one or more of the following associated native plant species: *Alyxia oliviformis, Dodonaea viscosa, Osteomeles anthyllidifolia,* or *Santalum ellipticum;* and

(ii) Elevations between 528 and 1,091 m (1,732 and 3,579 ft).

Family Poaceae: *Ischaemum byrone* (Hilo ischaemum)

Maui 6—*Ischaemum byrone*—a and Maui 7—*Ischaemum byrone*—b, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Ischaemum byrone* on Maui. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Close proximity to the ocean, among rocks or on basalt cliffs in windward coastal dry shrubland and containing one or more of the following associated native plant species: *Bidens* sp., *Fimbristylis cymosa,* or *Scaevola taccada;* and

(ii) Elevations between 0 and 132 m (0 and 432 ft).

Family Primulaceae: *Lysimachia lydgatei* (NCN)

Maui 17—*Lysimachia lydgatei*—a, Maui 17—*Lysimachia lydgatei*—b, Maui 17—*Lysimachia lydgatei*—c, Maui 17—*Lysimachia lydgatei*—d, and Maui 17—*Lysimachia lydgatei*—e, identified in the

legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Lysimachia lydgatei* on Maui. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Sides of steep ridges in *Metrosideros polymorpha-Dicranopteris linearis*-dominated wet to mesic shrubland or *M. polymorpha-Cheirodendron* spp. montane forest and containing one or more of the following associated native plant species: *Astelia* sp., *Broussaisia arguta, Coprosma* spp., *Dodonaea viscosa, Eurya sandwicensis, Ilex anomala, Leptecophylla tameiameiae, Lycopodium* spp., *Ochrosia* spp., *Vaccinium spp.,* or mat ferns such as *Dicranopteris* spp.; and

(ii) Elevations between 829 and 1,432 m (2,720 and 4,698 ft).

Family Rhamnaceae: *Colubrina oppositifolia* (kauila)

Maui 13—*Colubrina oppositifolia*—a, Maui 17—*Colubrina oppositifolia*—b, and Maui 18—*Colubrina oppositifolia*—c, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Colubrina oppositifolia* on Maui. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Lowland dry and mesic forests dominated by *Diospyros sandwicensis* and containing one or more of the following associated native plant species: *Bidens micrantha* spp. *micrantha, Canavalia* spp., *Dodonaea viscosa, Freycinetia arborea, Metrosideros polymorpha, Microlepia strigosa, Pleomele auwahiensis, Psydrax odorata, Reynoldsia sandwicensis,* or *Wikstroemia* sp.; and

(ii) Elevations between 193 and 844 m (633 and 2,769 ft).

Family Rhamnaceae: *Gouania vitifolia* (NCN)

Maui 17—*Gouania vitifolia*—a, identified in the legal description in paragraph (e)(1) of this section, constitutes critical habitat for *Gouania vitifolia* on Maui. Within this unit, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) The sides of ridges and gulches in dry to mesic forests and containing one or more of the following associated native plant species: *Bidens* sp., *Carex meyenii, Chamaesyce* spp., *Diospyros sandwicensis, Dodonaea viscosa, Erythrina sandwicensis, Hedyotis* sp., *Hibiscus* spp., *Melicope* sp., *Nestegis sandwicensis, Pipturus albidus, Psychotria* sp., or *Urera glabra;* and

(ii) Elevations between 357 and 1,167 m (1,171 and 3,829 ft).

Family Rubiaceae: *Hedyotis coriacea* (kioele)

Maui 17—*Hedyotis coriacea*—a and Maui 17—*Hedyotis coriacea*—b, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Hedyotis coriacea* on Maui. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Steep, rocky slopes in dry lowland *Dodonaea viscosa*-dominated shrublands and containing one or more of the following associated native plant species: *Bidens menziesii, Gouania hillebrandii, Melanthera lavarum, Myoporum sandwicense, Schiedea menziesii,* or *Sida fallax;* and

(ii) Elevations between 159 and 754 m (522 and 2,474 ft).

Family Rubiaceae: *Hedyotis mannii* (pilo)

Maui 17—*Hedyotis mannii*—a, identified in the legal description in paragraph (e)(1) of this section, constitutes critical habitat for *Hedyotis mannii* on Maui. Within this unit, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Basalt cliffs along stream banks in *Metrosideros polymorpha-Dicranopteris linearis* montane wet forest and containing one or more of the following associated native plant species: *Boehmeria grandis, Carex meyenii, Cyrtandra grayi, Cyrtandra hawaiensis, Cyrtandra platyphylla, Cyanea* sp., *Hedyotis acuminata, Isachne distichophylla, Machaerina* sp., *Phyllostegia* sp., *Pipturus albidus, Psychotria* sp., *Touchardia latifolia,* or *Urera glabra;* and

(ii) Elevation between 340 and 1,593 m (1,115 and 5,226 ft).

Family Rutaceae: *Melicope adscendens* (alani)

Maui 13—*Melicope adscendens*—a, identified in the legal description in paragraph (e)(1) of this section, constitutes critical habitat for *Melicope adscendens* on Maui. Within this unit, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Aa lava with pockets of soil in *Nestegis sandwicensis-Pleomele auwahiensis-Dodonaea viscosa* lowland mesic forest or open dry forest and containing one or more of the following associated native plant species: *Alphitonia ponderosa, Chamaesyce celastroides* var. *lorifolia, Leptecophylla tameiameiae, Osteomeles anthyllidifolia, Pouteria sandwicensis, Santalum ellipticum,* or *Xylosma hawaiiensis;* and

(ii) Elevations between 761 and 1,209 m (2,497 and 3,967 ft).

Family Rutaceae: *Melicope balloui* (alani)

Maui 8—*Melicope balloui*—a and Maui 9—*Melicope balloui*—b, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Melicope balloui* on Maui. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Mesic to wet forest containing one or more of the following associated native plant species: *Acacia koa, Cibotium chamissoi, Cibotium glaucum, Diplazium sandwichianum, Melicope clusiifolia, Metrosideros polymorpha,* or *Sadleria pallida;* and

(ii) Elevations between 781 and 1,544 m (2,561 and 5,267 ft).

Family Rutaceae: *Melicope knudsenii* (alani)

Maui 9—*Melicope knudsenii*—a and Maui 13—*Melicope knudsenii*—b, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Melicope knudsenii* on Maui. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Forested flats or talus slopes in *Nestegis sandwicensis-Pleomele* sp. mixed open dry forests and containing one or more of the following associated native plant species: *Alphitonia ponderosa, Dodonaea viscosa, Osteomeles anthyllidifolia, Santalum ellipticum,* or *Xylosma hawaiiensis;* and

(ii) Elevations between 648 and 1,231 m (2,125 and 4,039 ft).

Family Rutaceae: *Melicope mucronulata* (alani)

Maui 9—*Melicope mucronulata*—a and Maui 13—*Melicope mucronulata*—b, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Melicope mucronulata* on Maui. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Gentle south-facing slopes in lowland dry to mesic forest and containing one or more of the following associated species: *Antidesma pulvinatum, Dodonaea viscosa, Melicope hawaiensis, Nestegis sandwicensis, Pleomele auwahiensis, Pouteria sandwicensis,* or *Streblus pendulinus;* and

(ii) Elevations between 625 and 1,232 m (2,050 and 4,042 ft).

Family Rutaceae: *Melicope ovalis* (alani)

Maui 9—*Melicope ovalis*—a, identified in the legal description in paragraph (e)(1) of this section, constitutes critical habitat for *Melicope ovalis* on Maui. Within this unit, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) *Acacia koa* and *Metrosideros polymorpha*-dominated montane wet forests along streams and containing one or more of the following associated species: *Broussaisia arguta, Cheirodendron trigynum, Dicranopteris linearis, Dubautia plantaginea, Hedyotis hillebrandii, Labordia hedyosmifolia, Machaerina angustifolia, Perrottetia sandwicensis,* or *Wikstroemia oahuensis;* and

(ii) Elevations between 753 and 1,537 m (2,469 and 5,042 ft).

Family Rutaceae: *Zanthoxylum hawaiiense* (ae)

Maui 8—*Zanthoxylum hawaiiense*—a, identified in the legal description in paragraph (e)(1) of this section, constitutes critical habitat for *Zanthoxylum hawaiiense* on Maui. Within this unit, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Open lowland dry or mesic *Nestegis sandwicensis-Pleomele auwahiensis* forest or Acacia koa-Pleomele auwahiensis forest or montane dry forest and containing one or more of the following associated native species: *Alectryon macrococcus, Alphitonia ponderosa, Charpentiera* sp., *Diospyros sandwicensis, Dodonaea viscosa, Melicope* sp., *Metrosideros polymorpha, Myrsine lanaiensis, Osteomeles anthyllidifolia, Pisonia* sp., *Santalum ellipticum, Sophora chrysophylla, Streblus pendulinus,* or *Xylosma hawaiiensis;* and

(ii) Elevations between 869 and 1,298 m (2,852 and 4,260 ft).

Family Sapindaceae: *Alectryon macrococcus* (mahoe)

Maui 9—*Alectryon macrococcus*—a, Maui 10—*Alectryon macrococcus*—b, Maui 13—*Alectryon macrococcus*—c, Maui 17—*Alectryon macrococcus*—d, Maui 17—*Alectryon macrococcus*—e, and Maui 18—*Alectryon macrococcus*—f, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Alectryon macrococcus* on Maui. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Mesic to wetter mesic and upper dryland forest and containing one or more of the following associated native plant species: *Alphitonia ponderosa, Antidesma platyphylla, Antidesma pulvinatum, Bobea sandwicensis, Diospyros sandwicensis, Dodonaea viscosa, Nestegis sandwicensis, Osteomeles anthyllidifolia, Pittosporum confertiflorum, Pittosporum glabrum, Pouteria sandwicensis, Santalum ellipticum, Streblus pendulinus, Xylosma hawaiiensis,* or *Xylosma* sp.; and

(ii) Elevations between 333 and 1,191 m (1,092 and 3,909 ft).

Family Urticaceae: *Neraudia sericea* (NCN)

Maui 9—*Neraudia sericea*—a and Maui 17—*Neraudia sericea*—b, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Neraudia sericea* on Maui. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Dry to mesic *Metrosideros polymorpha-Dodonaea viscosa-Leptecophylla tameiameiae* shrubland or forest or *Acacia koa* forest and containing one or more of the following associated native plant species: *Bobea* sp., *Coprosma* sp., *Cyrtandra oxybapha, Cyrtandra* spp., *Diospyros* sp., *Hedyotis* sp., *Sida fallax,* or *Urera glabra;* and

(ii) Elevations between 198 and 1,658 m (650 and 5,439 ft).

Family Violaceae: *Isodendrion pyrifolium* (aupaka)

Maui 17—*Isodendrion pyrifolium*—a, identified in the legal description in paragraph (e)(1) of this section, constitutes critical habitat for *Isodendrion pyrifolium* on Maui. Within this unit, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Dry shrubland containing one or more of the following associated native plant taxa: *Capparis sandwichiana, Dodonaea viscosa, Myoporum sandwicense,* or *Psydrax odorata;* and

(ii) Elevations between 85 and 534 m (279 and 1,752 ft).

(2) *Ferns and Allies.*

Family Adiantaceae: *Pteris lidgatei* (NCN)

Maui 17—*Pteris lidgatei*—a and Maui 17—*Pteris lidgatei*—b, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Pteris lidgatei* on Maui. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Steep stream banks in wet *Metrosideros polymorpha-Dicranopteris linearis* montane forest and containing one or more of the following native plant species: *Christella cyatheoides, Cibotium chamissoi, Dicranopteris linearis, Elaphoglossum crassifolium, Sadleria squarrosa,* or *Sphenomeris chinensis;* and

(ii) Elevations between 213 and 1,593 m (699 and 5,226 ft).

Family Aspleniaceae: *Asplenium fragile* var. *insulare* (NCN)

Maui 9—*Asplenium fragile* var. *insulare*—a, identified in the legal description in paragraph (e)(1) of this section, constitutes critical habitat for *Asplenium fragile* var. *insulare* on Maui. Within this unit, the primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Streamside hollows and grottos in gulches in mesic to dry subalpine shrubland dominated by *Leptecophylla tameiameiae* and *Sadleria cyatheoides,* with scattered *Metrosideros polymorpha* and containing one or more of the following native plant species: *Dryopteris wallichiana, Grammitis hookeri,* or *Pteris cretica;* and

(ii) Elevations between 1,964 and 2,407 m (6,445 and 7,896 ft).

Family Aspleniaceae: *Ctenitis squamigera* (pauoa)

Maui 17—*Ctenitis squamigera*—a, Maui 17—*Ctenitis squamigera*—b, Maui 17—*Ctenitis squamigera*—c, and Maui 18—*Ctenitis squamigera*—d, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Ctenitis squamigera* on Maui. Within these units, the primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Forest understory in *Metrosideros polymorpha* montane wet forest, mesic forest, or diverse mesic forest and containing one or more of the following native plant species: *Alyxia oliviformis, Antidesma* sp., *Bobea* sp., *Canavalia* sp., *Coprosma* sp., *Dicranopteris linearis, Doodia* sp., *Dryopteris* sp., *Freycinetia arborea, Hedyotis terminalis, Hibiscus kokio* ssp. *kokio, Myrsine* sp., *Peperomia* sp., *Pittosporum* sp., *Pleomele* sp., *Pritchardia* sp., *Psychotria* sp., *Remya mauiensis, Sadleria* sp., *Schiedea pubescens* var. *pubescens,* or *Xylosma* sp.; and

(ii) Elevations between 275 and 1,421 m (902 and 4,662 ft).

Family Aspleniaceae: *Diellia erecta* (NCN)

Maui 9—*Diellia erecta*—a, Maui 9—*Diellia erecta*—b, Maui 17—*Diellia erecta*—c, Maui 17—*Diellia erecta*—d, Maui 17—*Diellia erecta*—e, and Maui 17—*Diellia erecta*—f, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Diellia erecta* on Maui. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Steep slopes or gulch sides in deep shade in *Acacia koa-Metrosideros polymorpha* low- to mid-elevation mesic forest and containing one or more of the following associated native plant species: *Coprosma* sp., *Dodonaea viscosa, Dryopteris unidentata, Leptecophylla tameiameiae, Melicope* sp., *Myrsine* sp., *Osteomeles anthyllidifolia,* or *Psychotria* sp.; and

(ii) Elevations between 338 and 1,695 m (1,109 and 5,561 ft).

Family Aspleniaceae: *Diplazium molokaiense* (NCN)

Maui 8—*Diplazium molokaiense*—a, Maui 9—*Diplazium molokaiense*—b, and Maui 17—*Diplazium molokaiense*—c, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Diplazium molokaiense* on Maui. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Water courses, often in proximity to waterfalls, in lowland or montane mesic *Metrosideros polymorpha-Acacia koa* forest; and

(ii) Elevations between 273 and 1,885 m (896 and 6,186 ft).

Family Lycopodiaceae: *Phlegmariurus mannii* (wawaeiole)

Maui 8—*Phlegmariurus mannii*—a, Maui 9—*Phlegmariurus mannii*—b, Maui 9—*Phlegmariurus mannii*—c, Maui 17—*Phlegmariurus mannii*—d, and Maui 17—*Phlegmariurus mannii*—e, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Phlegmariurus mannii* on Maui. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Epiphytic growth on *Metrosideros polymorpha, Dodonaea viscosa,* or *Acacia koa* trees in moist protected gulches or mossy tussocks in mesic to wet montane M*etrosideros polymorpha-Acacia koa* forests and containing one or more of the following associated native plant species: *Astelia menziesii, Athyrium* sp., *Cheirodendron trigynum, Coprosma* sp., *Cyanea* sp., *Cyrtandra* sp., *Ilex anomala, Leptecophylla tameiameiae, Machaerina* sp., *Myrsine* sp., *Sadleria* sp., *Thelypteris* sp., or *Vaccinium* sp.; and

(ii) Elevations from 952 and 1,688 m (3,122 and 5,539 ft).

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Dated: April 18, 2003.

Craig Manson,

Assistant Secretary for Fish and Wildlife and Parks.

[FR Doc. 03–10107 Filed 5–13–03; 8:45 am]

BILLING CODE 4310–55–P