

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

RIN 1018-AG71

Endangered and Threatened Wildlife and Plants; Final Designation or Nondesignation of Critical Habitat for 95 Plant Species From the Islands of Kauai and Niihau, 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 83 of the 95 species known historically from the Hawaiian islands of Kauai and Niihau. A total of approximately 21,266 hectares (ha) (52,549 acres (ac)) of land on the island of Kauai and 144 ha (357 ac) of land on the island of Niihau fall within the boundaries of the 217 critical habitat

units designated for the 83 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. This rule also determines that designating critical habitat would not be prudent for seven species. 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 March 31, 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 Lists of Endangered and Threatened Plants (50 CFR 17.12), there are 95 plant species that, at the time of listing, were reported from the islands of Kauai and/or Niihau (Table 1). Fifty-seven of these species are endemic to the islands of Kauai and Niihau, while 38 species are reported from one or more other islands, as well as Kauai and/or Niihau. Each of these species is described in more detail below in the section, "Discussion of Plant Taxa." Although we considered designating critical habitat on Kauai for each of the 95 plant species, for the reasons described below, the final designation includes critical habitat for 83 of 95 plant species. Species that also occur on other islands may have critical habitat designated on other islands in subsequent rulemakings.

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

Species	Island distribution						
	Kauai	Oahu	Molokai	Lanai	Maui	Hawaii	N.W. Isles, Kahoolawe, Niihau
<i>Acaena exigua</i> (liliwai)	H				H		
<i>Achyranthes mutica</i> (NCN*)	H					C	
<i>Adenophorus periens</i> (pendent kihi fern)	C	H	C	R	R	C	
<i>Alectryon macrococcus</i> (mahoe)	C	C	C		C		
<i>Alsinidendron lychnoides</i> (kuawawaenohu)	C						
<i>Alsinidendron viscosum</i> (NCN)	C						
<i>Bonamia menziesii</i> (NCN)	C	C	H	C	C	C	
<i>Brighamia insignis</i> (olulu)	C						Ni (C)
<i>Centaureum sebaeoides</i> (awiwi)	C	C	C	C	C		
<i>Chamaesyce halemanui</i> (NCN)	C						
<i>Ctenitis squamigera</i> (pauoa)	H	C	C	C	C	H	
<i>Cyanea asarifolia</i> (haha)	C						
<i>Cyanea recta</i> (haha)	C						
<i>Cyanea remyi</i> (haha)	C						
<i>Cyanea undulata</i> (NCN)	C						
<i>Cyperus trachysanthos</i> (puukaa)	C	C	H	H			Ni (C)
<i>Cyrtandra cyaneoides</i> (mapele)	C						
<i>Cyrtandra limahuliensis</i> (haiwale)	C						
<i>Delissea rhytidosperra</i> (NCN)	C						
<i>Delissea rivularis</i> (oha)	C						
<i>Delissea undulatra</i> (NCN)	C				H	C	Ni (H)
<i>Diellia erecta</i> (NCN)	C	C	C	H	C	C	
<i>Diellia pallida</i> (NCN)	C						
<i>Diplazium molokaiense</i> (NCN)	H	H	H	H	C		
<i>Dubautia latifolia</i> (koholapehu)	C						
<i>Dubautia pauciflorula</i> (naenae)	C						
<i>Euphorbia haeleeleana</i> (akoko)	C	C					
<i>Exocarpos luteolus</i> (heau)	C						
<i>Flueggea neowawraea</i> (mehamehame)	C	C	H		C	C	
<i>Gouania meyenii</i> (NCN)	C	C					
<i>Hedyotis cookiana</i> (awiwi)	C	H	H			H	
<i>Hedyotis st. johnii</i> (Na Pali beach hedyotis)	C						
<i>Hesperomannia lydgatei</i> (NCN)	C						
<i>Hibiscadelphus woodii</i> (hau kuahiwi)	C						
<i>Hibiscus brackenridgei</i> (mao hau hele)	H	C	H	C	C	C	Ka (R)

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

Species	Island distribution						
	Kauai	Oahu	Molokai	Lanai	Maui	Hawaii	N.W. Isles, Kahoolawe, Niihau
<i>Hibiscus clayi</i> (Clay's hibiscus)	C						
<i>Hibiscus waimeae</i> ssp. <i>hannerae</i> (kokio keokeo)	C						
<i>Ischaemum byrone</i> (Hilo ischaemum)	C	H	C		C	C	
<i>Isodendron laurifolium</i> (aupaka)	C	C					
<i>Isodendron longifolium</i> (aupaka)	C	C					
<i>Isodendron pyrifolium</i> (wahine noho kula)		H	H	H	H	C	Ni (H)
<i>Kokia kauaiensis</i> (kokio)	C						
<i>Labordia lydgatei</i> (kamakahala)	C						
<i>Labordia tinifolia</i> var. <i>wahiawaensis</i> (kamakahala)	C						
<i>Lipochaeta fauriei</i> (nehe)	C						
<i>Lipochaeta micrantha</i> (nehe)	C						
<i>Lipochaeta waimeae</i> (nehe)	C						
<i>Lobelia niihauensis</i>	C	C					Ni (H)
<i>Lysimachia filifolia</i> (NCN)	C	C					
<i>Mariscus pennatifolius</i> (NCN)	H	H			C	H	NW (C)
<i>Melicope haupuensis</i> (alani)	C						
<i>Melicope knudsenii</i> (alani)	C				C		
<i>Melicope pallida</i> (alani)	C	C					
<i>Melicope quadrangularis</i> (alani)	H						
<i>Munroidendron racemosum</i> (NCN)	C						
<i>Myrsine linearifolia</i> (kolea)	C						
<i>Nothocestrum peltatum</i> (aiea)	C						
<i>Panicum niihauense</i> (lau ehū)	C						Ni (H)
<i>Peucedanum sandwicense</i> (makou)	C	C	C		C		
<i>Phlegmariurus mannii</i> (wawaeiole)	H				C	C	
<i>Phlegmariurus nutans</i> (wawaeiole)	H	C					
<i>Phyllostegia knudsenii</i> (NCN)	C						
<i>Phyllostegia waimeae</i> (NCN)	C						
<i>Phyllostegia wawrana</i> (NCN)	C						
<i>Plantago princeps</i> (laukahi kuai)	C	C	C		C	H	
<i>Platanthera holochila</i> (NCN)	C	H	C		C		
<i>Poa mannii</i> (Mann's bluegrass)	C						
<i>Poa sandwicensis</i> (Hawaiian bluegrass)	C						
<i>Poa siphonoglossa</i> (NCN)	C						
<i>Pritchardia aylmer-robinsonii</i> (wahane)							Ni (C)
<i>Pritchardia napaliensis</i> (loulū)	C						
<i>Pritchardia viscosa</i> loulū	C						
<i>Pteralyxia kauaiensis</i> (kaulū)	C						
<i>Remya kauaiensis</i> (NCN)	C						
<i>Remya montgomeryi</i> (NCN)	C						
<i>Schiedea apokremnos</i> (maolioli)	C						
<i>Schiedea helleri</i> (NCN)	C						
<i>Schiedea kauaiensis</i> (NCN)	C						
<i>Schiedea membranacea</i> (NCN)	C						
<i>Schiedea nuttallii</i> (NCN)	C	C	C		R		
<i>Schiedea spargulina</i> var. <i>leiopoda</i> (NCN)	C						
<i>Schiedea spargulina</i> var. <i>spargulina</i> (NCN)	C						
<i>Schiedea stellarioides</i> (NCN)	C						
<i>Sesbania tomentosa</i> (ohai)	C	C	C	H	C	C	Ni (H), Ka (C), NW Isles (C)
<i>Silene lanceolata</i> (NCN)	H	C	C	H		C	
<i>Solanum incompletum</i> (popolo ku mai)	H		H	H	H	C	
<i>Solanum sandwicense</i> (aiakeakua, popolo)	C	H					
<i>Spermolepis hawaiiensis</i> (NCN)	C	C	C	C	C	C	
<i>Stenogyne campanulata</i> (NCN)	C						
<i>Vigna o-wahuensis</i> (NCN)		H	C	C	C	C	Ni (H), Ka, (C)
<i>Viola helenae</i> (NCN)	C						
<i>Viola kauaiensis</i> var. <i>wahiawaensis</i> (nani waialeale) ..	C						
<i>Wilkesia hobbii</i> (dwarf iliau)	C						
<i>Xylosma crenatum</i> (NCN)	C						
<i>Zanthoxylum hawaiiense</i> (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

The Islands of Kauai and Niihau

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

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

Discussion of Plant Taxa

Species Endemic to Kauai and Niihau

Alsinidendron lychnoides (kuawawaenohu)

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

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

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

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

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

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

Alsinidendron viscosum (no common name (NCN))

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

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

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

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

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

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

Brighamia insignis (olulu)

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

tapers toward the top, ending in a compact rosette of fleshy leaves. This short-lived perennial species is a member of a unique endemic Hawaiian genus with only one other species, *B. rockii* (pua ala), presently known only on Molokai, from which it differs by the color of its petals, its shorter calyx (sepals) lobes, and its longer flower stalks (Lammers 1999; 59 FR 9304).

Current reproduction is not thought to be sufficient to sustain populations of this species, with poor seedling establishment due to competition with nonnative grasses as the limiting factor. Pollination by native sphingid moths (Sphingidae family) is likely; however, pollination failure is common, due to either a lack of pollinators or a reduction in genetic variability. The flower structure appears to favor outcrossing (pollination between different parent plants). Some vegetative cloning has been observed and flower and leaf size appear to be dependent on moisture availability. Seeds of this species are undoubtedly dispersed by gravity. Although they may be blown for short distances, they are not adapted for wind dispersal, being ovoid to ellipsoid, smooth, and lacking any sort of wing or outgrowth (Service 1995; 59 FR 9304).

Historically, *Brighamia insignis* was known from the headland between Hoolulu and Waiahuakua Valleys along the Na Pali Coast on the island of Kauai, and from Kaali Spring on the island of Niihau. Currently, there are a total of four occurrences containing a total of about 42 to 62 individuals on the islands of Kauai and Niihau. It is reported on State land (Hono O Na Pali Natural Area Reserve (NAR)) and privately owned lands at Hoolulua and Waiahuakua Valleys, Haupu, and Keopaweo, and on the privately owned island of Niihau (GDSI 2000; HINHP Database 2000; Service 1995; Steve Perlman, NTBG, pers. comm., 2000).

Brighamia insignis is found at elevations between 0 and 748 m (0 and 2,453 ft) on rocky ledges with little soil or on steep sea cliffs in lowland dry grasslands or shrublands with annual rainfall that is usually less than 165 centimeters (cm) (65 inches (in)). Associated native plant species include *Artemisia australis* (ahinahina), *Chamaesyce celastroides* (akoko), *Eragrostis variabilis* (kawelu), *Heteropogon contortus* (pili grass), *Hibiscus kokio* (kokio), *Hibiscus kokio* ssp. *saintjohnianus* (kokio), *Lepidium serra* (anaunau), *Lipochaeta succulenta* (nehe), *Munroidendron racemosum* (NCN), or *Sida fallax* (ilima) (59 FR 9304; K. Wood, pers. comm., 2001).

The major threats to this plant are browsing and habitat degradation by

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

Chamaesyce halemanui (NCN)

Chamaesyce halemanui, a short-lived perennial member of the spurge family (Euphorbiaceae), is a scandent (climbing) shrub. It is distinguished from closely related species by its decussate leaves (arranged in pairs at right angles to the next pair above or below), persistent stipules (bract- or leaf-like structures), more compact flower clusters, shorter stems on cyathia (flower cluster), and smaller capsules (Koutnik 1987; Koutnik and Huft 1999; 57 FR 20580).

Little is known about the life history of *Chamaesyce halemanui*. Its flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1995).

Historically, *Chamaesyce halemanui* was found in Kauhao and Makaha Valleys in the Na Pali-Kona Forest Reserve, Mahanaloa Valley in Kuia NAR, the Halemanu drainage in Kokee State Park, and Olokele Canyon on the island of Kauai. Currently, there are a total of nine occurrences, containing about 85 to 135 individuals, in Kuia Valley, Poopooiki Valley, Kauhao Valley, Kaha Ridge, Awaawapuhi Valley, Waipio Falls, Halemanu, and Kaluahaulu in the Kokee State Park, Kuia NAR, and Na Pali-Kona Forest Reserve on State-owned land (GDSI 2000; HINHP Database 2000; K. Wood, *in litt.* 1999; K. Wood, pers. comm., 2001).

Chamaesyce halemanui is typically found on the steep slopes of gulches in mesic *Acacia koa* forests at elevations between 556 and 1,249 m (1,825 and 4,097 ft). Associated native plant species include *Alphitonia ponderosa* (kauila), *Antidesma platyphyllum* (hame), *Asplenium* spp., *Bobea brevipes* (ahakea lau lii), *Carex meyenii*, *Carex wahuensis*, *Cheirodendron trigynum* (olapa), *Coprosma* spp., *Diospyros sandwicensis* (lama), *Dodonaea viscosa*,

Elaeocarpus bifidus (kalia), *Hedyotis terminalis*, *Kokia kauaiensis* (kokio), *Leptecophylla tameiameiae* (pukiawe), *Melicope haupuensis* (alani), *Metrosideros polymorpha*, *Microlepia strigosa* (palapalai), *Panicum nephelophilum*, *Pisonia* spp. (papala kepau), *Pittosporum* spp. (hoawa), *Pleomele aurea*, *Pouteria sandwicensis* (alaa), *Psychotria greenwelliae* (kopiko), *Psychotria mariniana* (kopiko), or *Santalum freycinetianum* (iliahii) (57 FR 20580; K. Wood, pers. comm., 2001).

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

Cyanea asarifolia (haha)

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

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

Historically, *Cyanea asarifolia* was known only from along the bank of Anahola Stream on Kauai. Currently, two occurrences with approximately four or five individuals are reported from the headwaters of the Wailua River in central Kauai on State-owned land in the Lihue-Koloa Forest Reserve (GDSI 2000; HINHP Database 2000).

This species typically grows in pockets of soil on sheer wet rock cliffs and waterfalls in lowland wet forests at elevations between 182 and 1,212 m (597 and 3,976 ft). Associated native plant species include ferns, *Bidens* spp. (kookoolau), *Dubautia plantaginea* (naenae), *Hedyotis centranthoides* (NCN), *Hedyotis elatior* (awiiwi), *Lysimachia filifolia* (kolokolo kuahiwi), *Machaerina angustifolia* (uki), *Metrosideros polymorpha*, or *Panicum lineale* (NCN) (59 FR 9304; K. Wood, pers. comm., 2001).

The major threats to this species are a risk of extinction from naturally occurring events, such as hurricanes

and rock slides, and/or reduced reproductive vigor due to the small number of existing individuals; predation by introduced slugs and rodents (roof rats (*Rattus rattus*) and mice (*Mus musculus*)); and habitat degradation by feral pigs (59 FR 9304).

Cyanea recta (haha)

Cyanea recta, a member of the bellflower family (Campanulaceae), is an unbranched shrub with densely hairy flowers. This short-lived perennial species is distinguished from other species in the genus that grow on Kauai by the following characteristics: horizontal or ascending inflorescence; narrowly elliptic leaves 12 to 28 cm (4.7 to 11 in) long; flat leaf margins; and purple berries (Lammers 1990).

Little is known about the life history of *Cyanea recta*. Its flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1998a).

Historically, *Cyanea recta* was found in upper Hanalei Valley, Waioli Valley, Hanapepe Valley, Kalalau cliffs, Wainiha Valley, Makaleha Mountains, Limahuli Valley, Powerline Trail, and the Lehua Makanoe-Alakai area on the island of Kauai. Currently, there is a total of eight occurrences, with approximately 198 to 208 individuals, on State and private lands in the following areas: Waioli Valley, the left and right branches of Wainiha Valley, Makaleha Mountains, and Puu Eu, including areas in Halelea Forest Reserve, Kealia Forest Reserve, and the Lihue-Koloa Forest Reserve (GDSI 2000; HINHP Database 2000).

Cyanea recta grows in lowland wet or mesic *Metrosideros polymorpha* forest or shrubland, usually in gulches or on slopes, and typically at elevations between 234 and 1,406 m (768 and 4,613 ft). Associated native plant species include *Antidesma platyphyllum*, *Cheirodendron platyphyllum* (lapalapa), *Cibotium* spp. (hapuu), *Dicranopteris linearis*, *Diplazium* spp. (NCN), or *Psychotria* spp. (61 FR 53070; K. Wood, pers. comm., 2001).

The major threats to this species are bark removal and other damage by rats; habitat degradation by feral pigs; browsing by goats; unidentified slugs that feed on the stems; and competition with the nonnative plant species *Blechnum occidentale* (blechnum fern), *Clidemia hirta* (Koster's curse), *Crassocephalum crepidioides* (NCN), *Deparia petersenii* (NCN), *Erechtites valerianifolia* (fireweed), *Lantana camara*, *Melastoma candidum* (NCN),

Paspalum conjugatum (Hilo grass), *Rubus rosifolius* (thimbleberry), *Sacciolepis indica* (Glenwood grass), or *Youngia japonica* (Oriental hawkbeard) (61 FR 53070).

Cyanea remyi (haha)

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

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

Currently, there are seven known occurrences with approximately 394 to 484 individuals among them on the island of Kauai. *Cyanea remyi* is reported from Pali Elele, Waioli Valley, Makaleha, Blue Hole, Kawaikini, and Kapalaoa on privately and State-owned lands, including the Halelea and Lihue-Koloa Forest Reserves (GDSI 2000; HINHP Database 2000; Lammers and Lorence 1993; K. Wood, *in litt.* 1999).

Cyanea remyi is usually found in narrow drainages and wet streambanks in lowland wet forest or shrubland at elevations between 215 and 1,167 m (704 and 3,829 ft). Associated native plant species include various "finger ferns" (in the Grammitidaceae family) and "filmy ferns" (in the Hymenophyllaceae family), *Adenophorus* spp. (NCN), *Antidesma platyphyllum*, *Bidens* spp., *Broussaisia arguta*, *Cheirodendron* spp., *Cyrtandra* spp., *Diplazium sandwichianum*, *Eragrostis grandis* (kawelu), *Freycinetia arborea* (ieie), *Hedyotis terminalis*, *Machaerina angustifolia*, *Metrosideros polymorpha*, *Perrottetia sandwicensis* (olomea), *Pipturus* spp. (mamaki), *Psychotria hexandra* (kopiko), *Syzygium sandwicensis* (ohia ha), *Thelypteris* spp. (palapalaia), *Touchardia latifolia* (olona), or *Urera glabra* (opuhe) (61 FR 53070; K. Wood, pers. comm., 2001).

The major threats to this species are competition with the nonnative plant species *Erechtites valerianifolia*, *Melastoma candidum*, *Paspalum conjugatum*, *Psidium cattleianum*, or *Rubus rosifolius*; habitat degradation by feral pigs; browsing by feral goats; predation by rats; unidentified slugs

that feed on the stems; and a risk of extinction from naturally occurring events, such as landslides or hurricanes, due to the small number of remaining populations (61 FR 53070).

Cyanea undulata (haha)

Cyanea undulata, a member of the bellflower family (Campanulaceae), is an unbranched (or the stem is occasionally forked) shrub or subshrub with fine rust-colored hairs covering the lower surface of the leaves. Its undulating leaf margins distinguish the species from other Kauai members of the genus (Lammers 1990, 1999).

Native members of the Campanulaceae (bellflower) family, including the genus *Cyanea*, are generally believed to be adapted to pollination by native nectar-eating passerine birds, such as the Hawaiian "honeycreepers." The long, tubular, slightly curved flowers of *C. undulata* fit this model, but field observations are lacking. The fleshy orange fruits of this species are adapted for bird dispersal like other species of *Cyanea*. Although recognized as a short-lived perennial species, specific details of the life history of this species, such as growth rates, age plants begin to flower, and longevity of plants, are unknown (Lorence and Flynn 1991; Service 1994).

Historically, *Cyanea undulata* was known only from the Wahiawa Bog area on Kauai. Currently, one occurrence with a total of 28 individuals is reported on privately owned land along the bank of a tributary of the Wahiawa Stream in the Wahiawa drainage (GDSI 2000; HINHP Database 2000).

Cyanea undulata typically grows in narrow drainages and wet streambanks in *Metrosideros polymorpha* dry to montane wet forest or shrubland at elevations between 145 and 1,066 m (476 and 3,497 ft). Associated native species include various grammitid and filmy ferns, *Adenophorus* spp., *Antidesma platyphyllum*, *Broussaisia arguta*, *Cheirodendron* spp., *Diplazium sandwichianum*, *Dryopteris glabra*, *Eragrostis grandis* (kawelu), *Bidens* spp., *Freycinetia arborea*, *Machaerina angustifolia*, *Mariscus* spp. (NCN), *Melicope feddei* (alani), *Perrottetia sandwicensis*, *Pipturus* spp., *Psychotria mariniana*, *Psychotria hexandra*, *Sadleria pallida* (amau), *Sadleria squarrosa* (apuu), *Smilax melastomifolia* (pioi), *Sphenomeris chinensis* (palaa), *Syzygium sandwicensis*, or *Thelypteris* spp. (Service 1994; K. Wood, pers. comm., 2001).

The primary threats to this species include competition with the nonnative plant species *Clidemia hirta*, *Cyathea*

cooperi (Australian tree fern), *Deparia petersenii*, *Elephantopus mollis* (NCN), *Erechtites valerianifolia*, *Melaleuca quinquenervia* (paperbark tree), *Melastoma candidum*, *Oplismenus hirtellus* (basketgrass), *Paspalum conjugatum*, *Paspalum urvillei* (Vasey grass), *Pluchea carolinensis* (sourbush), *Psidium cattleianum*, *Rhodomyrtus tomentosa* (rose myrtle), *Rubus rosifolius*, *Sacciolepis indica*, *Setaria parviflora*, *Stachytarpheta australis*, or *Youngia japonica*; trampling by feral pigs; landslides; seed predation by rats; herbivory by introduced slugs; loss of pollinators; hurricanes; and decreased reproductive vigor, restricted distribution, and extinction due to unforeseen circumstances because of small population size (Service 1994; 56 FR 47695).

Cyrtandra cyaneoides (mapele)

Cyrtandra cyaneoides, a member of the African violet family (Gesneriaceae), is an erect or ascending, fleshy, usually unbranched shrub with opposite toothed leaves which have impressed veins on the lower surface that are sparsely covered with long hairs. This short-lived perennial species differs from others of the genus that grow on Kauai by being a succulent, erect or ascending shrub; a bilaterally symmetrical calyx that is spindle-shaped in bud and falls off after flowering; leaves that are 41 to 56 cm (16 to 22 in) long and 23 to 35 cm (9 to 14 in) wide and have a wrinkled surface; and berries with shaggy hairs (Wagner *et al.* 1999).

Little is known about the life history of *Cyrtandra cyaneoides*. Its flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1998a).

Historically, *Cyrtandra cyaneoides* was known to occur only along the trail to Waialae Valley on Kauai until recently discovered in other areas. It is currently known from five occurrences, containing about 354 to 454 individuals, on private and State lands (including Halelea Forest Reserve and Alakai Wilderness Preserve) at Pihea, Waioli Valley, Lumahai, the left branch of Wainiha Valley, and Makaleha (GDSI 2000; HINHP Database 2000; 61 FR 53070).

Cyrtandra cyaneoides typically grows on talus rubble on steep slopes or cliffs with water seeps running below, near streams or waterfalls in lowland or montane wet forest or shrubland dominated by *Metrosideros polymorpha* or a mixture of *M. polymorpha*, *Cheirodendron* spp., and *Dicranopteris*

linearis at elevations between 157 and 1,406 m (514 and 4,614 ft). Associated native species include *Bidens* spp., *Boehmeria grandis* (akolea), *Coprosma* spp., *Cyanea* spp. (haha), *Cyrtandra longifolia* (haiwale), *Cyrtandra kauaiensis* (ulunahale), *Cyrtandra limahuliensis* (haiwale), *Diplazium sandwichianum*, *Freycinetia arborea*, *Gunnera kauaiensis* (ape ape), *Hedyotis terminalis*, *Hedyotis tryblum* (NCN), *Machaerina* spp., *Melicope clusiifolia* (kukaemoa), *Melicope puberula* (alani), *Perrottetia sandwicensis*, *Pipturus* spp., *Psychotria* spp., *Pritchardia* spp. (loulou), or *Stenogyne purpurea* (NCN) (61 FR 53070; K. Wood, pers. comm., 2001).

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

Cyrtandra limahuliensis (haiwale)

Cyrtandra limahuliensis, a member of the African violet family (Gesneriaceae), is an unbranched or few-branched shrub with moderately or densely hairy leaves. The following combination of characteristics distinguishes this short-lived perennial species from others of the genus: the leaves are usually hairy (especially on lower surfaces), the usually symmetrical calyx is tubular or funnel-shaped and encloses the fruit at maturity, and the flowers are borne singly (Wagner *et al.* 1990).

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

Historically, *Cyrtandra limahuliensis* was known from three locations on Kauai: Wainiha Valley, Lumahai Valley, and near Kilauea River, until it was recently discovered in additional areas. Currently, a total of 13 occurrences, containing approximately 2,746 to 3,024 individuals, are reported on private and State lands (including the Halelea, Kealia, and Lihue-Koloa Forest Reserves) at Limahuli Falls, Lumahai Valley, Waipa Valley, Waioli Valley, Kekoiki, Makaleha, the right fork of Wainiha Valley, Kualapa, Blue Hole, Kepalaoa, and Puu Kolo (GDSI 2000; HINHP Database 2000).

This species typically grows along streambanks in lowland wet forests at

elevations between 208 and 1,594 m (681 and 5,228 ft). Associated native plant species include *Antidesma platyphyllum*, *Bidens* spp., *Boehmeria grandis*, *Charpentiera* spp. (papala), *Cibotium glaucum* (hapuu), *Cyanea* spp., *Cyrtandra kealiae* (haiwale), *Dicranopteris linearis*, *Diplazium sandwichianum*, *Dubautia* spp. (naenae), *Eugenia reinwardtiana* (nioi), *Gunnera kauaiensis*, *Hedyotis terminalis*, *Hibiscus waimeae* (kokio keokeo), *Metrosideros polymorpha*, *Perrottetia sandwicensis*, *Pipturus* spp., *Pisonia* spp., *Pritchardia* spp., *Psychotria* spp., *Touchardia latifolia*, or *Urera glabra* (59 FR 9304; K. Wood, pers. comm., 2001).

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

Delissea rhytidosperma (NCN)

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

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

Historically, *Delissea rhytidosperma* was known from as far north as Wainiha and Limahuli Valleys, as far east as Kapaa and Kealia, and as far south as the Haupu Range, between the elevations of 122 and 915 m (400 and 3,000 ft) on the island of Kauai. Currently, three occurrences on private and State lands (including Kuia NAR), with a total of 11 individuals, are reported from Kuia Valley, Puhakukane, and the Haupu Range (GDSI 2000; HINHP Database 2000).

This species generally grows in well-drained soils with medium or fine-textured subsoil in *Diospyros* (lama) diverse lowland mesic forests or diverse *Metrosideros polymorpha*-*Acacia koa* forests at elevations between 167 and 895 m (547 and 2,935 ft). Associated native plant species include grammitid

ferns, *Adenophorus* spp., *Cyanea* spp., *Dianella sandwicensis*, *Diospyros sandwicensis*, *Dodonaea viscosa*, *Doodia kunthiana*, *Euphorbia haeleeleana* (akoko), *Hedyotis* spp. (NCN), *Leptecophylla tameiameia*, *Microlepia strigosa*, *Nestegis sandwicensis* (olopua), *Pisonia* spp., *Psychotria hobbayi* (kopiko), or *Pteralyxia kauaiensis* (kaulu) (59 FR 9304; K. Wood, pers. comm., 2001).

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

Delissea rivularis (oha)

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

Little is known about the life history of *Delissea rivularis*. Its flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1998a).

Historically, *Delissea rivularis* was found at Waiakealoha Waterfall, Waialae Valley, Hanakoa Valley, and Kaholuamanu on the island of Kauai (61 FR 53070). Currently, this species is known from two occurrences with a total of 40 individuals. The occurrences are reported from Moaalele and Hanakapiai on State land within the Hono o Na Pali NAR (GDSI 2000; HINHP Database 2000; K. Wood, *in litt.* 1999).

Delissea rivularis is found on steep slopes near streams in *Metrosideros polymorpha*-*Cheirodendron trigynum* montane wet or mesic forest at elevations between 722 and 1,306 m (2,370 and 4,286 ft). Associated native plant species include *Boehmeria grandis*, *Broussaisia arguta*, *Carex* spp., *Coprosma* spp., *Dubautia knudsenii* (naenae), *Diplazium sandwichianum*,

Hedyotis foggiana (NCN), *Ilex anomala*, *Machaerina angustifolia*, *Melicope anisata* (mokihana), *Melicope clusiifolia*, *Pipturus* spp., *Psychotria hexandra*, or *Sadleria* spp. (amau) (61 FR 53070; K. Wood, pers. comm., 2001).

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

Diellia pallida (NCN)

Diellia pallida, a member of the spleenwort family (Aspleniaceae), is a fern that grows in tufts of three to four light green, lance-shaped fronds along with a few persistent dead ones, and reproduces by spores, the minute, reproductive dispersal unit of ferns and fern allies. This short-lived perennial species differs from others of this endemic Hawaiian genus by the color and sheen of the midrib, the presence and color of scales on the midrib, and the frequent fusion of sori (a group or cluster of spore cases) (Wagner 1952, 1987).

Little is known about the life history of *Diellia pallida*. Its reproductive cycles, dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1995).

Diellia pallida was known historically from Halemanu on the island of Kauai. More recently additional occurrences have been found and currently, there is a total of six occurrences with 43 to 48 individuals in Mahanaloa and Kuia Valleys, Makaha Valley, Waimea Canyon, and Koaie Canyon, all on State-owned land including Kuia NAR, Na Pali-Kona Forest Reserve, and Puu Ka Pele Forest Reserve (GDSI 2000; HINHP Database 2000; 59 FR 9304; K. Wood, *in litt.* 1999).

This species grows on bare granular soil with dry to mesophytic leaf litter with a pH of 6.9 to 7.9 on steep talus slopes in lowland mesic forests at elevations between 445 and 1,027 m (1,460 and 3,371 ft). Associated native plant species include *Acacia koa*, *Alectryon macrococcus*, *Alphitonia ponderosa*, *Alyxia oliviformis*, *Antidesma platyphyllum*, *Asplenium* spp., *Carex meyenii*, *Diospyros hillebrandii* (lama), *Diospyros sandwicensis*, *Doodia kunthiana*, *Hedyotis knudsenii* (NCN), *Leptecophylla tameiameia*, *Metrosideros polymorpha*, *Microlepia strigosa*, *Myrsine lanaiensis* (kolea),

Nestegis sandwicensis, *Psychotria mariniana*, *Psydrax odorata* (alahee), *Pteralyxia kauaiensis*, *Rauvolfia sandwicensis* (hao), *Tetraplasandra kawaiensis* (ohe ohe), *Wilkesia gymnoxiphium* (iliau), or *Zanthoxylum dipetalum* (ae) (59 FR 9304; K. Wood, pers. comm., 2001).

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

Dubautia latifolia (koholapehu)

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

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

Historically, *Dubautia latifolia* was found in the Makaha, Awaawapuhi, Waialae, Kawaiula, and Kauhao Valleys of the Na Pali-Kona Forest Reserve, Nualolo Trail and Valley in Kuia NAR; Halemanu in Kokee State Park; along Mohihi Road in both Kokee State Park and Na Pali-Kona Forest Reserve, along the Mohihi-Waialae Trail on Mohihi and Kohua Ridges in both Na Pali-Kona Forest Reserve and Alakai Wilderness Preserve; and at Kaholuamanu on the

island of Kauai. Currently, there are a total of 26 occurrences containing approximately 65 to 84 individuals on State-owned land in Kauahao Valley, Makaha Valley headwaters, Kuia Valley, Kawaiula Valley, Kumuwela Ridge, Awaawapuhi Valley, Waiakoali picnic area, Alakai picnic area, Honopu Trail, Nualolo Trail, Waieke Swamp, Noe Stream, Kumuwela Ridge, Mohihi Ditch, Mohihi-Waialae Trail, and Kaluahaulu Ridge in the Alakai Wilderness Preserve, Kokee State Park, Kuia NAR, Na Pali-Kona Forest Reserve, and Waimea Canyon State Park (Carr 1982b; GDSI 2000; HINHP Database 2000; K. Wood, *in litt.* 1999).

This species typically grows on gentle to steep slopes in well drained soil in semi-open or closed, diverse montane mesic forest dominated by *Acacia koa* and/or *Metrosideros polymorpha*, at elevations between 544 and 1,277 m (1,786 and 4,189 ft). Commonly associated native plant species are *Alphitonia ponderosa*, *Antidesma platyphyllum*, *Bobea* spp., *Claoxylon sandwicense* (poola), *Coprosma waimeae* (olena), *Cyrtandra* spp., *Dicranopteris linearis*, *Diplazium sandwicianum*, *Dodonaea viscosa*, *Elaeocarpus bifidus*, *Hedyotis terminalis*, *Ilex anomala*, *Melicope anisata*, *Nestegis sandwicensis*, *Pleomele aurea*, *Pouteria sandwicensis*, *Psychotria mariniana*, *Scaevola* spp. (naupaka), or *Xylosma* spp. (maua) (59 FR 9304; K. Wood, pers. comm., 2001).

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

Dubautia pauciflora (naenae)

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

Few details are known about the life history of any *Dubautia* species under natural conditions. Certain species produce viable seed when self-pollinated (self-fertile), although others fail to do so (self-infertile). Low pollinator numbers resulting in reduced

cross-pollination and consequently low numbers of viable seeds could explain the small population sizes. Because of their structure and small size, flowers of *D. pauciflora* are presumably pollinated by small generalist insects, although field observations are lacking. The bristle-like pappus (tuft of appendages that crowns the ovary or fruit) probably represents an adaptation for wind dispersal. Very little is known about the life cycle of this species, including growth rates, longevity of the plants, and number of years the plants remain reproductive (Carr 1985; Service 1994; 56 FR 47695).

Historically and currently, this species is found only on State (including the Lihue-Koloa Forest Reserve) and privately owned lands in the Wahiawa drainage on Kauai. There are four occurrences containing 42 individual plants (GDSI 2000; HINHP Database 2000).

These populations are found in *Metrosideros polymorpha-Dicranopteris linearis* lowland wet forest within stream drainages at elevations between 564 and 1,093 m (1,849 and 3,587 ft). Associated native plant species include *Antidesma platyphyllum*, *Broussaisia arguta*, *Cheirodendron* spp., *Dubautia laxa* (naenae pua melemele), *Embelia pacifica* (kilioe), *Hesperomannia lydgatei*, *Labordia waialealae* (kamakahala lau lii), *Melicope* spp., *Nothoperanema rubiginosa* (NCN), *Pritchardia* spp., *Psychotria* spp., *Sadleria* spp., *Scaevola mollis* (naupaka kuahiwi), *Syzygium sandwicensis*, or *Tetraplasandra* spp. (ohe ohe) (K. Wood, pers. comm., 2001).

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

Exocarpos luteolus (heau)

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

with four indentations and by the color of the receptacle and fruit (Wagner *et al.* 1999).

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

Historically, *Exocarpos luteolus* was known from three general locations on Kauai: Wahiawa Bog, Kaholuamanu, and Kumuwela Ridge. Currently, there is a total of nine occurrences containing approximately 75 individual plants. This species has a scattered distribution on State (Kuia NAR, Na Pali Coast State Park, Na Pali-Kona Forest Reserve, and Puu Ka Pele Forest Reserve) and privately owned lands and is reported from Pohakuao, the right fork and left fork of Kalalau Valley, Hipalau Valley, Koaie Canyon, Mahanaloa Valley, Kuia Valley, Poopooiki Valley, Nualolo Trail, Makaha Valley, and Haeleele Valley (GDSI 2000; HINHP Database 2000; K. Wood, *in litt.* 1999).

This species is found at elevations between 361 and 1,465 m (1,183 and 4,808 ft) in wet places bordering swamps or open bogs and on open, dry ridges in lowland or montane mesic *Acacia koa-Metrosideros polymorpha*-dominated forest communities with *Dicranopteris linearis*. Associated native plant species include *Bobea brevipes*, *Cheirodendron trigynum*, *Claoxylon sandwicense*, *Dianella sandwicensis*, *Dodonaea viscosa*, *Dubautia laevigata*, *Elaeocarpus bifidus*, *Hedyotis terminalis*, *Leptecophylla tameiameia*, *Melicope haupuensis*, *Peperomia* spp., *Pleomele aurea*, *Poa sandwicensis* (Hawaiian bluegrass), *Pouteria sandwicensis*, *Psychotria greenwelliae*, *Psychotria mariniana*, *Santalum freycinetianum*, or *Schiedea stellarioides* (Service 1995; 59 FR 9304; K. Wood, pers. comm., 2001).

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

Hedyotis st.-johnii (Na Pali beach hedyotis)

Hedyotis st.-johnii, a member of the coffee family (Rubiaceae), is a succulent perennial herb with slightly woody, trailing, quadrangular stems and fleshy leaves clustered towards the base of the

stem. This species is distinguished from related species by its succulence, basally clustered fleshy leaves, shorter floral tube, and large leafy calyx lobes when in fruit (Wagner *et al.* 1999).

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

Currently, there are a total of eleven occurrences, containing approximately 227 to 292 individuals, on State-owned land in Nualolo Valley, Nualolo Kai, Kaahole Valley, Keawanui, Kawaiula Valley, Milolii Spring, Makaha Point, Polihale Spring, Kalepa Valley, and Nakeikionaiwi Caves within the Na Pali Coast State Park and Puu Ka Pele Forest Reserve (GDSI 2000; HINHP Database 2000).

This plant grows in the crevices of north-facing, near-vertical coastal cliff faces within the spray zone in sparse dry coastal shrubland at elevations between 0 and 187 m (0 and 613 ft). Associated native plant species include *Artemisia australis*, *Bidens* spp., *Capparis sandwichiana* (maiapilo), *Chamaesyce celastroides*, *Eragrostis variabilis*, *Heteropogon contortus*, *Lipochaeta connata* (nehe), *Lycium sandwicense* (ohelo kai), *Myoporum sandwicense* (naio), *Nototrichium sandwicense* (kului), or *Schiedea apokremnos* (maolioli) (56 FR 49639; K. Wood, pers. comm., 2001).

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

Hesperomannia lydgatei (NCN)

Hesperomannia lydgatei, a member of the aster family (Asteraceae) is a sparsely branched, small, long-lived perennial tree 2 to 4 m (6.5 to 13 ft) tall with lance-shaped or elliptic leaves. The flower heads are clustered at the ends of branches and pendant (hanging) when mature. The species is distinguished from other members of this endemic Hawaiian genus by its pendant flower heads, longer and narrower hairless flower stalks, and shorter involucrel (floral) bracts (Wagner *et al.* 1999).

Almost no mature fruits develop, and it is possible that *Hesperomannia*

lydgatei is self-infertile and fails to set seed unless cross-pollinated with other individuals. The flower heads with long, tubular yellow florets suggest pollination by long-tongued insects such as moths or butterflies, although field observation is required to confirm this. Absence of the appropriate pollinator(s) could be responsible for the observed lack of viable seeds. The plume-like hairs crowning the fruit strongly suggests dispersal by wind, as in many members of the aster family. This species grows almost exclusively along streams, however, so dispersal by water currents is also likely. Specific details regarding growth rates, age trees begin flowering in the wild, length of time they remain reproductive, and longevity of the plants are unknown (Service 1994).

Historically, *Hesperomannia lydgatei* was found in the Wahiawa Mountains of Kauai. Currently, this species is known from State (Halelea Forest Reserve) and privately owned lands in the Pali Elele, Waiole Valley, Wahiawa and Kapalaoa areas. There are four occurrences containing a total of 304 individual plants (GDSI 2000; HINHP Database 2000; K. Wood, *in litt.* 1999).

Hesperomannia lydgatei is found at elevations between 207 and 1,570 m (680 and 5,151 ft) along streambanks and forested slopes in rich brown soil and silty clay in *Metrosideros polymorpha* or *M. polymorpha-Dicranopteris linearis* lowland wet forest. Associated native plant species include *Adenophorus periens* (pendent kihi fern), *Antidesma platyphyllum*, *Broussaisia arguta*, *Cheirodendron* spp., *Cyanea* spp., *Dubautia knudsenii*, *Dubautia laxa*, *Dubautia pauciflora*, *Dubautia raillardii* (naenae), *Elaphoglossum* spp., *Freycinetia arborea*, *Hedyotis terminalis*, *Labordia lydgatei* (kamakahala), *Machaerina angustifolia*, *Peperomia* spp., *Pritchardia* spp., *Psychotria hexandra*, or *Syzygium sandwicense* (HINHP Database 2000; Service 1994; K. Wood, pers. comm., 2001).

Threats to the species include nonnative plants, feral goats, rats, landslides, and erosion (Service 1994).

Hibiscadelphus woodii (hau kuahiwi)

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

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

Hibiscadelphus woodii has been found only at the site of its original discovery on State-owned land in the left branch of Kalalau Valley, within the Na Pali Coast State Park on Kauai. Only two trees of this species are currently known (GDSI 2000; HINHP Database 2000; K. Wood, *in litt.* 2001).

Hibiscadelphus woodii is found at elevations between 219 and 1,197 m (717 and 3,926 ft) on basalt talus or cliff walls in *Metrosideros polymorpha* montane mesic forest. These forests contain one or more of the following associated native plant species: *Artemisia australis*, *Bidens sandwicensis* (kookoolau), *Carex meyenii*, *Chamaesyce celastroides* var. *hanapeensis* (akoko), *Dubautia* spp., *Hedyotis* spp., *Lepidium serra*, *Lipochaeta* spp. (nehe), *Lobelia niihauensis* (NCN), *Lysimachia glutinosa* (kolokolo kuahiwi), *Melicope pallida* (alani), *Myrsine* spp. (kolea), *Nototrichium* spp. (kului), *Panicum lineale*, *Poa mannii* (NCN), or *Stenogyne campanulata* (NCN) (HINHP Database 2000; Lorence and Wagner 1995; 61 FR 53070; K. Wood, pers. comm., 2001).

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

Hibiscus clayi (Clay's hibiscus)

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

Little is known about the life history of *Hibiscus clayi*. Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific

environmental requirements, and limiting factors are unknown (Service 1995).

Historically, *Hibiscus clayi* was known from scattered locations on Kauai: the Kokee region on the western side of the island, Moloaa Valley to the north, Nounou Mountain in Wailua to the east, and as far south as Haiku near Haliu Stream. At this time, only one occurrence on State land in the Nounou Mountains, with a total of four individuals, is known to be extant (GDSI 2000; HINHP Database 2000).

Hibiscus clayi generally grows on slopes at elevations between 9 and 765 m (29 and 2,509 ft) in *Acacia koa* or *Diospyros* spp.-*Pisonia* spp.-*Metrosideros polymorpha* lowland dry or mesic forest with *Artemisia australis*, *Bidens* spp., *Cyanea hardyi* (haha), *Gahnia* spp., *Hedyotis acuminata* (au), *Munroidendron racemosum* (NCN), *Pandanus tectorius* (hala), *Panicum tenuifolium* (mountain pili), *Pipturus* spp., *Pleomele aurea*, *Psychotria* spp., or *Psydrax odorata* (HINHP Database 2000; 59 FR 9304; K. Wood, pers. comm., 2001).

The major threats to this species are herbivory and habitat degradation by feral pigs; competition from the nonnative plant species *Araucaria columnaris* (Norfolk Island pine) and *Psidium cattleianum*; trampling by humans; and a risk of extinction due to naturally occurring events, such as landslides or hurricanes, as well as decreased reproductive vigor because of the small population size and restricted distribution (HINHP Database 2000; 59 FR 9304).

Hibiscus waimeae ssp. *hannerae* (kokio keokeo)

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

Little is known about the life history of *Hibiscus waimeae* ssp. *hannerae*. Its flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1998a).

Historically, *Hibiscus waimeae* ssp. *hannerae* was known from Kalihiwai and adjacent valleys, Limahuli Valley, and Hanakapiai Valley. This subspecies is no longer extant at Kalihiwai. Currently, there are two occurrences containing 27 individuals on State (Na Pali Coast State Park) and privately owned lands in Hanakapiai Valley, Limahuli Valley, and Pohakuao (Bates 1999; GDSI 2000; HINHP Database 2000).

Hibiscus waimeae ssp. *hannerae* grows at elevations between 174 and 1,154 m (570 and 3,787 ft). It is found in *Metrosideros polymorpha*-*Dicranopteris linearis* or *Pisonia* spp.-*Charpentiera elliptica* (papala) lowland wet or mesic forest with *Antidesma* spp., *Bidens* spp., *Bobea* spp., *Cibotium* spp., *Cyanea* spp., *Cyrtandra* spp., *Perrottetia sandwicensis*, *Pipturus* spp., *Psychotria* spp., *Sadleria* spp., or *Syzygium sandwicensis* (Bates 1999; HINHP Database 2000; Service 1998a; K. Wood, pers. comm., 2001).

Major threats to *Hibiscus waimeae* ssp. *hannerae* are habitat degradation by feral pigs, competition with nonnative plant species, and a risk of extinction from naturally occurring events (e.g., landslides and hurricanes) and/or reduced reproductive vigor due to the small number of remaining populations (HINHP Database 2000; 61 FR 53070).

Kokia kauaiensis (kokio)

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

Little is known about the life history of *Kokia kauaiensis*. Its flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1998a).

Historically, *Kokia kauaiensis* was found as seven scattered occurrences on northwestern Kauai. Currently, there are a total of 21 occurrences with 166 to 171 individuals, found in Pohakuao, the left branch of Kalalau Valley, Paaiki Valley, Kuia Valley, Koaie Canyon, Kipalau Valley, and Kawaiiki Valley, all on State-owned land within Kuia NAR, Na Pali Coast State Park, and Na Pali-Kona Forest Reserve (GDSI 2000; HINHP Database 2000; K. Wood, *in litt.* 1999).

Kokia kauaiensis typically grows in diverse mesic forest at elevations between 215 and 1,049 m (707 and

3,441 ft). Associated native plant species include *Acacia koa*, *Alyxia oliviformis*, *Antidesma* spp., *Bobea* spp., *Chamaesyce celastroides*, *Claoxylon sandwicense*, *Dicranopteris linearis*, *Diellia pallida*, *Diospyros hillebrandii*, *Diospyros sandwicensis*, *Dodonaea viscosa*, *Flueggea neowawraea* (mehamehame), *Hedyotis* spp., *Hibiscus* spp. (aloalo), *Isodendron laurifolium* (aupaka), *Lipochaeta fauriei* (nehe), *Melicope* spp., *Metrosideros polymorpha*, *Nestegis sandwicensis*, *Nototrichium* spp., *Pisonia* spp., *Pleomele aurea*, *Pterulia sandwicensis*, *Psydrax odorata*, *Pteralyxia kauaiensis*, *Rauvolfia sandwicensis*, *Santalum freycinetianum* var. *pyrularium* (iliahi), *Streblus pendulinus* (aia), *Syzygium sandwicensis*, *Tetraplasandra* spp., or *Xylosma* spp. (Bates 1999; HINHP Database 2000; Service 1998a; K. Wood, pers. comm., 2001).

Competition with and habitat degradation by invasive nonnative plant species, substrate loss from erosion, habitat degradation and browsing by feral goats and deer, and seed predation by rats are the major threats affecting the survival of *Kokia kauaiensis* (HINHP Database 2000; Service 1998a; Wood and Perlman 1993).

Labordia lydgatei (kamakahala)

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

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

This species was originally known from the Wahiawa drainage, Waioli Stream Valley, and Makaleha Mountains on Kauai. *Labordia lydgatei* is currently known from six occurrences, consisting of 37 individual plants, located on State (Lihue-Koloa and Haleleale Forest Reserves) and privately owned lands at Pali Elele, Waioli Valley, Lelewi, Lumahai Valley, and Kapalaoa (GDSI

2000; HINHP Database 2000; K. Wood, *in litt.* 1999).

Labordia lydgatei is found on streambanks in *Metrosideros polymorpha*-*Dicranopteris linearis* lowland wet forest at elevations between 182 and 1,048 m (597 and 3,437 ft). Associated native plant species include *Antidesma platyphyllum* var. *hillebrandii* (hame), *Cyanea* spp., *Cyrtandra* spp., *Dubautia knudsenii*, *Hedyotis terminalis*, *Ilex anomala*, *Labordia hirtella* (kamakahala), *Psychotria* spp., or *Syzygium sandwicensis* (HINHP Database 2000; Service 1994; K. Wood, pers. comm., 2001).

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

Labordia tinifolia var. *wahiawaensis* (kamakahala)

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

Little is known about the life history of *Labordia tinifolia* var. *wahiawaensis*. Its flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown.

Labordia tinifolia var. *wahiawaensis* has only been known from one occurrence with a current total of approximately 20 to 30 individual plants on private land in the Wahiawa drainage in the Wahiawa Mountains (GDSI 2000; HINHP Database 2000).

Labordia tinifolia var. *wahiawaensis* grows along streambanks in lowland wet forests dominated by *Metrosideros polymorpha* at elevations between 458 and 1,006 m (1,502 and 3,301 ft), with *Antidesma platyphyllum*, *Athyrium microphyllum* (akolea), *Cheirodendron* spp., *Cyrtandra* spp., *Dicranopteris linearis*, *Hedyotis terminalis*, or

Psychotria spp. (HINHP Database 2000; K. Wood, pers. comm., 2001).

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

Lipochaeta fauriei (nehe)

Lipochaeta fauriei, a member of the aster family (Asteraceae), is a perennial herb with somewhat woody, erect or climbing stems. This short-lived perennial species differs from other species on Kauai by having a greater number of disk and ray flowers per flower head, longer ray flowers, and longer leaves and leaf stalks (Gardner 1976, 1979; Service 1995; Wagner *et al.* 1985, 1990).

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

Historically and currently, *Lipochaeta fauriei* is known from Olokele Canyon on Kauai. This species is now found on State-owned land in Poopooiki Valley, Kuia Valley, Haelele Valley, and Kawaiiki Valley within Kuia NAR, Na Pali-Kona Forest Reserve, and Puu Ka Pele Forest Reserve. Currently there is a total of five occurrences with 82 individuals. An occurrence in Koaie Canyon previously thought to be *L. fauriei* was later identified as *Melanthera subcordata* (nehe) (Gardner 1979; GDSI 2000; HINHP Database 2000; Service 1995; K. Wood, *in litt.* 1999).

This species grows most often in moderate shade to full sun and is usually found on the sides of steep gulches in diverse lowland mesic forests at elevations between 436 and 947 m (1,432 and 3,108 ft). Associated native plant species include *Acacia koa*, *Carex meyenii*, *Carex wahuensis*, *Dicranopteris linearis*, *Diospyros* spp., *Dodonaea viscosa*, *Euphorbia haeleleana*, *Hibiscus waimeae*, *Kokia kauaiensis*, *Myrsine lanaiensis*, *Nestegis sandwicensis*, *Pleomele aurea*, *Psychotria greenwelliae*, *Psychotria mariniana*, or *Sapindus oahuensis* (lonomea) (HINHP Database 2000; K. Wood, pers. comm., 2001).

Major threats to *Lipochaeta fauriei* are predation and habitat degradation by feral goats and pigs and competition with invasive nonnative plants. Fire is also a significant threat to *L. fauriei* due

to the invasion of *Melinis minutiflora*, a fire-adapted grass that creates unnaturally high fuel loads. The small total number of individuals makes the species susceptible to extinction from naturally occurring events, such as landslides or hurricanes, and/or reduced reproductive vigor (HINHP Database 2000; Service 1995; 59 FR 9304).

Lipochaeta micrantha (nehe)

Lipochaeta micrantha, a member of the aster family (Asteraceae), is a somewhat woody short-lived perennial herb. The small number of disk flowers separates this species from the other members of the genus on the island of Kauai. The two recognized varieties of this species, var. *exigua* and var. *micrantha*, are distinguished by differences in leaf length and width, degree of leaf dissection, and the length of the ray florets (Gardner 1976, 1979; Wagner *et al.* 1990).

Little is known about the life histories of *Lipochaeta micrantha* var. *exigua* and *L. m.* var. *micrantha*. Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1995).

Historically, *Lipochaeta micrantha* var. *exigua* was only known from the Haupu Range on Kauai. Currently, five occurrences of *L. micrantha* var. *exigua*, with a total of 110 individuals, are known from privately owned land in the vicinity of Haupu Range and southwest of Hokunui summit. Historically, *L. micrantha* var. *micrantha* has been known from Olokele Canyon, Hanapepe Valley, and the Koloa District on Kauai. Currently, this variety is only known from five occurrences totaling 121 individuals on State land within the Na Pali-Kona Forest Reserve in Koaie Canyon and Kawaiiki Valley (GDSI 2000; HINHP Database 2000).

Lipochaeta micrantha grows on cliffs, ridges, streambanks, or slopes in mesic to wet mixed communities at elevations between 35 and 1,362 m (115 and 4,468 ft). Associated species include *Acacia koa*, *Antidesma* spp., *Artemisia australis*, *Bidens sandwicensis*, *Bobea* spp., *Chamaesyce celastroides* var. *hanapepens*, *Diospyros* spp., *Dodonaea viscosa*, *Eragrostis grandis*, *Eragrostis variabilis*, *Hibiscus kokio*, *Lepidium bidentatum* (anaunau), *Lobelia niihauensis*, *Melicope* spp., *Metrosideros polymorpha*, *Neraudia kauaiensis* (NCN), *Nototrichum* spp., *Pipturus* spp., *Plectranthus parviflorus* (ala ala wai nui), *Pleomele aurea*, *Psydrax odorata*, *Rumex albescens* (huahuako), *Sida fallax*, or *Xylosma*

hawaiiense (maua) (HINHP Database 2000; Service 1995; K. Wood, pers. comm., 2001).

The major threats to both varieties of *Lipochaeta micrantha* are habitat degradation by feral pigs and goats and competition with nonnative plant species such as *Erigeron karvinskianus*, *Lantana camara*, *Pluchea carolinensis*, or *Stachytarpheta australis*. The species is also threatened by extinction from naturally occurring events, such as landslides or hurricanes, and/or reduced reproductive vigor due to the small number of existing populations (HINHP Database 2000; Lorence and Flynn 1991; Service 1995).

Lipochaeta waimeaensis (nehe)

Lipochaeta waimeaensis, a member of the aster family (Asteraceae), is a low growing, somewhat woody, short-lived perennial herb. This species is distinguished from other *Lipochaeta* species on Kauai by leaf shape and the presence of shorter leaf stalks and ray florets (Gardner 1976, 1979; Wagner *et al.* 1990).

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

Lipochaeta waimeaensis has been known only from the original site of discovery along the rim of Kauai's Waimea Canyon on State-owned land. There are no more than 100 individuals (GDSI 2000; HINHP Database 2000).

This species grows on eroded soil on a precipitous, shrub-covered gulch in a diverse lowland forest at elevations between 44 and 460 m (145 and 1,509 ft) with *Artemisia australis*, *Chamaesyce celastroides*, *Dodonaea viscosa*, *Lipochaeta connata*, *Panicum* spp. (NCN), *Santalum freycinetianum*, or *Schiedea pergrulina* (NCN) (HINHP Database 2000; Wagner *et al.* 1999; K. Wood, pers. comm., 2001).

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

Melicope haupuensis (alani)

Melicope haupuensis, a member of the rue family (Rutaceae), is a small

long-lived perennial tree. Unlike other species of this genus on Kauai, the exocarp (outermost layer of a fruit) and endocarp (innermost layer of a fruit) are hairless and the sepals are covered with dense hairs (Stone *et al.* 1999).

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

For 62 years, *Melicope haupuensis* was known only from the site of its original discovery on the north side of Haupu Ridge on Kauai. This occurrence is now gone. The species is now known from four occurrences with a total of 13 individuals on State-owned land within the Alakai Wilderness Preserve, Na Pali Coast State Park, and Na Pali-Kona Forest Reserve in Kalahu, Awaawapuhi Valley, and Koaie Canyon (GDSI 2000; HINHP Database 2000; K. Wood, *in litt.* 1999).

Melicope haupuensis grows on moist talus slopes in *Metrosideros polymorpha*-dominated lowland mesic forests or *M. polymorpha*-*Acacia koa* montane mesic forest at elevations between 111 and 1,249 m (364 and 4,097 ft). Associated native plant species include *Antidesma platyphyllum* var. *hillebrandii*, *Bobea brevipes*, *Cheirodendron trigynum*, *Claoxylon sandwicense*, *Cryptocarya mannii* (holio), *Dianella sandwicensis* (ukiuki), *Diospyros hillebrandii*, *Diospyros sandwicensis*, *Dodonaea viscosa*, *Elaeocarpus bifidus*, *Hedyotis terminalis*, *Melicope anisata*, *M. barbiger* (uahiapale), *M. ovata* (alani), *Pleomele aurea*, *Pouteria sandwicensis*, *Pritchardia minor* (loulou), *Psychotria greenwelliae*, *Psychotria mariniana*, *Tetraplasandra waimeae* (ohetikoolā), or *Zanthoxylum dipetalum* (HINHP Database 2000; K. Wood, pers. comm., 2001).

Habitat degradation by feral goats and competition with invasive nonnative plant species are the major threats to *Melicope haupuensis*. In addition, this species may be susceptible to the black twig borer (*Xylosandrus compactus*). The existence of only 13 known trees constitutes an extreme threat of extinction from naturally occurring events, such as landslides or hurricanes, or reduced reproductive vigor (Hara and Beardsley 1979; HINHP Database 2000; Medeiros *et al.* 1986; 59 FR 9304).

Melicope quadrangularis (alani)

Melicope quadrangularis, a member of the rue family (Rutaceae), is a shrub or small tree. Young branches are generally covered with fine yellow fuzz

but become hairless with age. This species differs from others in the genus in having the following combination of characters: oppositely arranged leaves, only one or two flowers per cluster, cube-shaped capsules with fused lobes, and a deep central depression at the top of the fruit (Stone *et al.* 1999).

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

Melicope quadrangularis is known from the type locality in the Wahiawa Bog region of Kauai. One adult plant and two seedlings were discovered in 1991 by Ken Wood of NTBG on an east-facing slope of Wahiawa Ridge at 853 m (2,800 ft) on privately owned land. Subsequent exploration resulted in the location of a total of 13 individuals of this species. Although a survey after hurricane Iniki in 1992 did not relocate any individuals, it is hoped that there is a seed bank or that undiscovered individuals remain to be found (Stone *et al.* 1999).

Melicope quadrangularis grows in *Metrosideros polymorpha* diverse lowland wet forest that ranges from mesic to wet conditions at elevations between 608 and 1,593 m (1,995 and 5,228 ft). Associated native plant species include *Antidesma platyphyllum*, *Broussaisia arguta*, *Cheirodendron fauriei* (olapa), *Cibotium nealiae* (hapuu), *Cyrtandra pickeringii* (haiwale), *Dicranopteris linearis*, *Machaerina angustifolia*, *Machaerina mariscoides* (ahaniu), other *Melicope* spp., *Metrosideros waialealae* (NCN), *Psychotria hexandra*, *P. mariniana*, *P. wawrae* (kopiko), *Sadleria pallida*, *Scaevola gaudichaudiana* (naupaka kuahiwi), or *Syzygium sandwicensis* (K. Wood, pers. comm., 2001).

This species is threatened by nonnative plants and habitat disturbance by feral pigs; over-collecting for scientific purposes; extinction from naturally occurring events, such as landslides or hurricanes; and/or reduced reproductive vigor due to the dearth of individuals (Service 1994).

Munroidendron racemosum (NCN)

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

its distinct flower clusters and corolla (Constance and Affolter 1999).

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

Historically, *Munroidendron racemosum* was known from scattered locations throughout the island of Kauai. Occurrences are now known from Waiahuakua, Pohakuao, the left and right branches of Kalalau Valley, Nakeikionaiwi Valley, Awaawapuhi Valley spring, Honopu Valley, Nualolo Valley, Poomau Valley, Kawaiiki Valley, Koaie Canyon, Nonou, Haupu, and Keopaweo. There are currently 17 known occurrences with approximately 59 to 99 individuals on State (Hono o Na Pali NAR, Na Pali Coast State Park, Na Pali-Kona Forest Reserve, Nonou Forest Reserve, and Puu Ka Pele Forest Reserve) and privately owned lands (GDSI 2000; HINHP Database 2000).

Munroidendron racemosum is typically found on steep exposed cliffs or on ridge slopes in coastal to lowland mesic forests at elevations between 6 and 979 m (19 and 3,213 ft). Associated plant species include *Bobea brevipes*, *Brighamia insignis*, *Canavalia napaliensis* (awikiwiki), *Diospyros hillebrandii*, *Diospyros sandwicensis*, *Nestegis sandwicensis*, *Pisonia sandwicensis* (aulu), *Pisonia umbellifera* (papala kepau), *Pleomele aurea*, *Pouteria sandwicensis*, *Psychotria* spp., *Psydrax odorata*, *Rauvolfia sandwicensis*, *Schiedea* spp. (NCN), *Sida fallax*, or *Tetraplasandra* spp. (Gagne and Cuddihy 1999; HINHP Database 2000; 59 FR 9304; K. Wood, pers. comm., 2001).

The threats to *Munroidendron racemosum* are competition with nonnative plant species, such as *Aleurites moluccana*, *Lantana camara*, *Leucaena leucocephala* (koa haole), or *Psidium guajava*; habitat degradation by feral goats and fruit predation by rats; introduced insects of the long-horned beetle family (Cerambycidae); fire; extinction from naturally occurring events, such as landslides or hurricanes; and reduced reproductive vigor (HINHP Database 2000; Service 1995; 59 FR 9304).

Myrsine linearifolia (kolea)

Myrsine linearifolia, a member of the myrsine family (Myrsinaceae), is a branched shrub. This long-lived perennial species is distinguished from others of the genus by the shape, length,

and width of the leaves, length of the petals, and number of flowers per cluster (Wagner *et al.* 1999).

Little is known about the life history of *Myrsine linearifolia*. Its flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1998a).

Historically, *Myrsine linearifolia* was found at scattered locations on Kauai: Olokele Valley, Kalualea, Kalalau Valley, Kahuamaa Flat, Limahuli-Hanakapi'ai Ridge, Koaie Stream, Pohakuao, Namolokama summit plateau, and Haupu. There are currently 12 occurrences with approximately 490 to 564 individuals on State (Alakai Wilderness Preserve and Na Pali Coast State Park) and privately owned lands. The populations are found in Limahuli Valley, Alealau, the left branch of Kalalau Valley, Puu O Kila, Koaie Canyon, Namolokama, and Kapalaoa (GDSI 2000; HINHP Database 2000; K. Wood, *in litt.* 1999).

Myrsine linearifolia typically grows at elevations between 105 and 1,380 m (346 and 4,526 ft) in diverse mesic or wet lowland or montane *Metrosideros polymorpha* forest with *Cheiodendron* spp. or *Dicranopteris linearis* as co-dominant species. Plants growing in association with this species include *Bobea brevipes*, *Cryptocarya mannii*, *Dubautia* spp., *Eurya sandwicensis* (anini), *Freycinetia arborea*, *Hedyotis terminalis*, *Lysimachia glutinosa*, *Machaerina angustifolia*, *Melicope* spp., *Myrsine* spp., *Nothoestrum* spp. (aiea), *Psychotria* spp., *Sadleria pallida*, or *Syzygium sandwicensis* (HINHP Database 2000; 61 FR 53070; K. Wood, pers. comm., 2001).

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

Nothoestrum peltatum (aiea)

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

Although plants of this long-lived perennial species have been observed flowering, they rarely set fruit. This could be the result of a loss of pollinators, reduced genetic variability, or an inability to fertilize itself. Little else is known about the life history of

Nothoestrum peltatum. Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (59 FR 9304).

Historically, *Nothoestrum peltatum* was known from Kauai at Kumuwela, Kaholuamanu, and the region of Nualolo. This species is now known from a total of 10 occurrences with 20 individuals, located at Kahuamaa Flats, Awaawapuhi Trail, Awaawapuhi Valley, Kawaiula Valley, and Makaha Valley on State-owned land within the Kokee State Park, Kuia NAR, Na Pali Coast State Park, Na Pali-Kona Forest Reserve, and Puu Ka Pele Forest Reserve (GDSI 2000; HINHP Database 2000; K. Wood, *in litt.* 1999).

This species generally grows in rich soil on steep slopes in mesic or wet forest dominated by *Acacia koa* or a mixture of *A. koa* and *Metrosideros polymorpha*, at elevations between 581 and 1,290 m (1,906 and 4,232 ft). Associated native plants include *Alphitonia ponderosa*, *Antidesma* spp., *Bobea brevipes*, *Broussaisia arguta*, *Cheiodendron trigynum*, *Claoxylon sandwicense*, *Coprosma* spp., *Cryptocarya mannii*, *Dianella sandwicensis*, *Dicranopteris linearis*, *Diplazium sandwichianum*, *Dodonaea viscosa*, *Elaeocarpus bifidus*, *Hedyotis terminalis*, *Ilex anomala*, *Melicope anisata*, *M. barbigera*, *M. haupuensis*, *Perrottetia sandwicensis*, *Pleomele aurea*, *Pouteria sandwicensis*, *Psychotria greenwelliae*, *Psychotria mariniana*, *Tetraplasandra kawaiensis*, or *Xylosma* spp. (HINHP Database 2000; K. Wood, pers. comm., 2001).

Competition with nonnative plants (such as *Erigeron karvinskianus*, *Lantana camara*, *Passiflora tarminiana*, or *Rubus argutus*), and habitat degradation by feral pigs, deer, and red jungle fowl (*Gallus gallus*) constitute the major threats to *Nothoestrum peltatum*. This species is also threatened by fire, risk of extinction from naturally occurring events (e.g., landslides or hurricanes), and reduced reproductive vigor due to the small number of existing individuals (HINHP Database 2000; 59 FR 9304).

Panicum niihauense (lau ehu)

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

Little is known about the life history of this species. Reproductive cycles,

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

Panicum niihauense was known historically from Niihau and one location on Kauai. Currently, this species is only known from one occurrence of 23 individuals at the Polihale State Park area of Kauai on State-owned land (GDSI 2000; HINHP Database 2000).

Panicum niihauense is found scattered in sand dunes in coastal shrubland at elevations between 0 and 103 m (0 and 337 ft). Associated native plant species include *Cassytha filiformis* (kaunaoa pehu), *Chamaesyce celastroides*, *Dodonaea viscosa*, *Nama sandwicensis* (hinahina kahakai), *Ophioglossum pendulum* ssp. *falcatum* (puapua moa), *Scaevola sericea* (naupaka kahakai), *Sida fallax*, *Sporobolus virginicus* (akiaki), or *Vitex rotundifolia* (kolokolo kahakai) (HINHP Database 2000; K. Wood, pers. comm., 2001).

Primary threats to *Panicum niihauense* are destruction by off-road vehicles, competition with nonnative plant species, and a risk of extinction from naturally occurring events (e.g., landslides or hurricanes) and reduced reproductive vigor due to the small number of individuals in the one remaining population (HINHP Database 2000; 61 FR 53108).

Phyllostegia knudsenii (NCN)

Phyllostegia knudsenii, a nonaromatic member of the mint family (Lamiaceae), is an erect herb or vine. This short-lived perennial species is distinguished from others in the genus by its specialized flower stalk; it differs from the closely related *P. floribunda* by often having four flowers per group (Wagner *et al.* 1999).

Little is known about the life history of *Phyllostegia knudsenii*. Its flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1998a).

Until 1993, *Phyllostegia knudsenii* was only known from the site of its original discovery made in the 1800s from the woods of Waimea on Kauai. There is currently one known occurrence with a total of 4 to 13 individuals on State-owned land in Koaie Canyon within the Alakai Wilderness Preserve (GDSI 2000; HINHP Database 2000; Wagner *et al.* 1999; K. Wood, *in litt.* 1999).

Phyllostegia knudsenii is found in *Metrosideros polymorpha* lowland mesic or wet forest at elevations between 399 and 1,059 m (1,309 and

3,475 ft). Associated native plant species include *Bobea timonioides* (ahakea), *Claoxylon sandwicense*, *Cryptocarya mannii*, *Cyrtandra kauaiensis*, *Cyrtandra paludosa* (moa), *Diospyros sandwicensis*, *Elaeocarpus bifidus*, *Ilex anomala*, *Myrsine linearifolia*, *Perrottetia sandwicensis*, *Pittosporum kauaiense* (hoawa), *Pouteria sandwicensis*, *Pritchardia minor*, *Selaginella arbuscula* (lepelepe moa), *Tetraplasandra oahuensis* (ohe mauka), or *Zanthoxylum dipetalum* (61 FR 53070; K. Wood, pers. comm., 2001).

Major threats to *Phyllostegia knudsenii* include habitat degradation by feral pigs and goats, competition with nonnative plants, and a risk of extinction from naturally occurring events (e.g., landslides and hurricanes) and reduced reproductive vigor due to the small number of individuals in the only known population (61 FR 53070; Service 1998a).

Phyllostegia waimeae (NCN)

Phyllostegia waimeae, a nonaromatic member of the mint family (Lamiaceae), is a climbing perennial plant. Characteristics that distinguish this species from others in the genus are the nearly stalkless bracts that partially overlap and cover the flowers, and relatively fewer oil glands on the leaves (Wagner *et al.* 1999).

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

Historically, *Phyllostegia waimeae* was known from Kaholuamanu and Kaaha on Kauai. Currently, one occurrence with six individuals persists on State land in Kawaiiki Valley within the Na Pali-Kona Forest Reserve (K. Wood, *in litt.* 2001).

This species typically grows in *Acacia koa-Metrosideros polymorpha* dominated wet or mixed mesic forest with *Cheirodendron* spp. or *Dicranopteris linearis* as co-dominants at elevations between 655 and 1,224 m (2,149 and 4,016 ft). Associated native plant species include *Broussaisia arguta*, *Claoxylon sandwicense*, *Diplazium sandwichianum*, *Dubautia knudsenii*, *Elaphoglossum* spp., *Gunnera kauaiensis*, *Hedyotis* spp., *Myrsine lanaiensis*, *Pleomele aurea*, *Psychotria* spp., *Sadleria* spp., *Scaevola procera* (naupaka kuahiwi), *Syzygium sandwicensis*, or *Vaccinium* spp. (K. Wood, pers. comm., 2001).

Habitat destruction by feral goats, erosion, and competition with

introduced grasses are the major threats to *Phyllostegia waimeae*. The species is also threatened by over-collecting for scientific purposes; extinction from naturally occurring events, such as hurricanes; and/or reduced reproductive vigor due to the small number of existing individuals (Service 1995).

Phyllostegia wawrana (NCN)

Phyllostegia wawrana, a nonaromatic member of the mint family (Lamiaceae), is a perennial vine that is woody toward the base and has long, crinkly hairs along the stem. This short-lived perennial species can be distinguished from the related *P. floribunda* and *P. knudsenii* by its less specialized flower stalk (Wagner *et al.* 1999).

Seeds were observed in the wild in August 1993. No additional life history information for this species is currently known (Service 1998a).

Phyllostegia wawrana was reported to be found at Hanalei on Kauai in the 1800s and along Kokee Stream in 1926. Currently, four occurrences with approximately 34 to 54 individuals are reported from Koaie Canyon, Moaalele, Awaawapuhi Valley, and Makaleha on State-owned land within the Alakai Wilderness Preserve, Hono o Na Pali NAR, and Kokee State Park (GDSI 2000; HINHP Database 2000).

This species grows at elevations between 398 and 1,284 m (1,306 and 4,212 ft) in *Acacia koa-Metrosideros polymorpha-Cheirodendron* mixed mesic forest. Associated native plant species include *Alectryon macrococcus*, *Asplenium polyodon*, *Athyrium microphyllum*, *Carex* spp., *Claoxylon sandwicense*, *Cyanea fissia* (haha), *Delissea rivularis*, *Dianella sandwicensis*, *Diplazium sandwichianum*, *Dodonaea viscosa*, *Doodia kunthiana*, *Dryopteris wallichiana*, *Dubautia knudsenii*, *Dubautia laevigata*, *Hedyotis tryblum*, *Machaerina angustifolia*, *Panicum nephelophilum*, *Peperomia* spp., *Perrottetia sandwicensis*, *Pleomele aurea*, *Poa sandwicensis*, *Pteridium aquilinum* var. *decompositum*, *Sadleria pallida*, *Scaevola procera*, *Schiedea stellarioides*, *Syzygium sandwicensis*, *Touchardia latifolia*, or *Vaccinium dentatum* (HINHP Database 2000; 61 FR 53070; K. Wood, pers. comm., 2001).

Major threats to *Phyllostegia wawrana* include habitat degradation by feral pigs and competition with nonnative plant species, such as *Erechtites valerianifolia*, *Erigeron karvinskianus*, *Melastoma candidum*, *Passiflora tarminiana*, *Rubus argutus*, and *Rubus rosifolius* (61 FR 53070; Service 1998a).

Poa mannii (Mann's bluegrass)

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

Little is known about the life history of *Poa mannii*. Flowering cycles, pollination vectors, longevity, specific environmental requirements, and limiting factors are unknown (Service 1995).

Historically, this species was found in Olokele Gulch on Kauai. Currently, there is a total of six occurrences with approximately 268 individuals on State-owned land in the right and left branches of Kalalau Valley, Awaawapuhi Valley, Kuia Valley, and Kauhao Valley within the Kuia NAR, Na Pali Coast State Park, Na Pali-Kona Forest Reserve, and Waimea Canyon State Park (GDSI 2000; HINHP Database 2000; O'Connor 1999; K. Wood, *in litt.* 1999).

This species typically grows on cliffs or rock faces in lowland or montane mesic *Metrosideros polymorpha* or *Acacia koa*-*M. polymorpha* forest at elevations between 327 and 1,222 m (1,072 and 4,009 ft). Associated native plant species include *Antidesma platyphyllum*, *Artemisia australis*, *Bidens cosmoides*, *Bidens sandvicensis*, *Carex meyenii*, *Carex wahuensis*, *Chamaesyce celastroides* var. *hanapepensis*, *Cyperus phleoides* (NCN), *Diospyros sandwicensis*, *Dodonaea viscosa*, *Eragrostis variabilis*, *Hedyotis terminalis*, *Lobelia niihauensis*, *Lobelia yuccoides* (panaunau), *Luzula hawaiiensis* (wood rush), *Melicope anisata*, *M. barbigera*, *M. pallida*, *Nototrichium* spp., *Panicum lineale*, *Pleomele aurea*, *Pouteria sandwicensis*, *Psychotria greenwelliae*, *Psychotria mariniana*, *Schiedea* spp., or *Wilkesia gymnoxiphium* (HINHP Database 2000; 59 FR 56330; K. Wood, pers. comm., 2001).

Poa mannii survives only in very steep areas that are inaccessible to goats, suggesting that goat herbivory may have eliminated this species from more accessible locations, as is the case for other rare plants from northwestern Kauai. Threats to *P. mannii* include habitat damage, trampling, and browsing by feral goats, and competition with invasive nonnative plants. *Erigeron*

karvinskianus has invaded Kalalau, Koaie, and Waialae Valleys, three of the areas where *P. mannii* occurs. *Lantana camara* threatens all known populations, and *Rubus argutus* threatens the populations in Kalalau and Waialae Valleys. *Poa mannii* is also threatened by fire and reduced reproductive vigor and/or extinction from naturally occurring events, such as landslides or hurricanes, due to the small number of existing populations and individuals (59 FR 56330).

Poa sandvicensis (Hawaiian bluegrass)

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

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

Historically, this species was known from the following areas on the island of Kauai: the rim of Kalalau Valley; Halemanu Ridge, Kumuwela Ridge, and Kauaikanana drainage; Awaawapuhi Trail; Kohua Ridge/Mohihi drainage; and Kaholuamanu. Hillebrand's (1888) reference to a Maui locality is most likely an error. Currently, there is a total of nine occurrences with 1,321 individuals on State-owned land. *Poa sandvicensis* is known to be extant at Alealau, Keanapuka, Awaawapuhi Trail, Kumuwela Ridge, Maile Flat Trail, Mohihi Stream, Mohihi-Waialae Trail, Kawaiiki Valley, and Waialae Valley in the Alakai Wilderness Preserve, Hono o Na Pali NAR, Kokee State Park, Na Pali Coast State Park, and Na Pali-Kona Forest Reserve (GDSI 2000; HINHP Database 2000; 57 FR 20580; K. Wood, *in litt.* 1999).

Poa sandvicensis grows on wet, shaded, gentle to steep slopes, ridges, and rock ledges of streambanks in semi-open to closed, wet, diverse *Acacia koa*-*Metrosideros polymorpha* montane forest, at elevations between 473 and 1,290 m (1,553 and 4,232 ft). Associated native plant species include *Alyxia oliviformis*, *Bidens sandvicensis*, *Cheirodendron* spp., *Claoxylon sandwicense*, *Coprosma* spp., *Dianella sandwicensis*, *Dicranopteris linearis*, *Dodonaea viscosa*, *Dubautia* spp., *Hedyotis* spp., *Melicope* spp., *Peperomia* spp., *Psychotria* spp., *Scaevola procera*, *Schiedea*

stellarioides, or *Syzygium sandwicensis* (HINHP Database 2000; 57 FR 20580; K. Wood, pers. comm., 2001).

The greatest immediate threats to the survival of *Poa sandvicensis* are competition from nonnative plants, such as *Erigeron karvinskianus*, *Hedychium* spp., *Passiflora tarminiana*, or *Rubus argutus*; erosion caused by feral pigs and goats; and State Forest Reserve trail maintenance activities and human recreation. In addition, naturally occurring events, such as landslides and hurricanes, constitute a threat of extinction or reduced reproductive vigor due to the species' small population size (Service 1995; 57 FR 20580).

Poa siphonoglossa (NCN)

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

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

Historically, *Poa siphonoglossa* was known from five sites on the island of Kauai: Kohua Ridge, near Kaholuamanu, Kaulaula Valley, Kuia Valley, and Kalalau. Currently, there are a total of five occurrences with a total of 50 individuals on State-owned land at Kahuamaa Flats, Mohihi-Waialae Trail, Kuia Valley, Makaha Ridge, and Kaulaula Valley in the Alakai Wilderness Preserve, Kuia NAR, Na Pali Coast State Park, Na Pali-Kona Forest Reserve, and Puu Ka Pele Forest Reserve (GDSI 2000; HINHP Database 2000; K. Wood, *in litt.* 1999).

Poa siphonoglossa typically grows on shady banks on steep slopes in mesic *Metrosideros polymorpha*-*Acacia koa* forests at elevations between about 480 and 1,296 m (1,573 and 4,251 ft). Associated native plant species include *Alphitonia ponderosa*, *Alyxia oliviformis*, *Bobea brevipes*, *Carex meyenii*, *Carex wahuensis*, *Coprosma waimeae*, *Dianella sandwicensis*, *Dodonaea viscosa*, *Dubautia* spp., *Hedyotis* spp., *Leptecophylla tameiameia*, *Lobelia yuccoides*, *Melicope* spp., *Microlepia strigosa*, *Myrsine* spp., *Panicum nephelophilum*, *Poa sandvicensis*, *Psychotria* spp., *Scaevola procera*, *Tetraplasandra*

kavaiensis, *Vaccinium* spp., *Wilkesia gymnoxiphium*, *Xylosma* spp., or *Zanthoxylum dipetalum* (57 FR 20580; K. Wood, pers. comm., 2001).

The primary threat to the survival of *Poa siphonoglossa* is habitat degradation and/or herbivory by feral pigs and deer. The nonnative plant *Rubus argutus* invading Kohua Ridge constitutes a probable threat to that population. Small population size and the potential for one disturbance event to destroy the majority of known individuals are also serious threats to this species (HINHP Database 2000; Service 1995; 57 FR 20580).

Pritchardia aylmer-robinsonii (wahane)

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

Little is known about the life history of *Pritchardia aylmer-robinsonii*. Its flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (61 FR 41020).

Historically, *Pritchardia aylmer-robinsonii* was found at three sites in the eastern and central portions of the island of Niihau. Trees were found on Kaali Cliff and in Mokouia and Haao Valleys at elevations between 70 and 270 m (230 and 885 ft) on privately owned land. The most recent observations indicate that two plants still remain on Kaali Cliff (GDSI 2000; HINHP Database 2000; Read and Hodel 1999).

Pritchardia aylmer-robinsonii typically grows on rocky talus in seepage areas within coastal dry forest at elevations between 91 to 259 m (300 to 850 ft). Associated native plant species include *Brighamia insignis*, *Cyperus trachysanthos*, *Lipochaeta lobata* var. *lobata* (nehe), or *Lobelia niihauensis*. Originally a component of the coastal dry forest, this species now occurs only in a rugged and steep area where it receives some protection from grazing ungulates (HINHP Database 2000; 61 FR 41020).

The species is threatened by habitat degradation and/or herbivory by cattle, feral pigs, and feral goats and seed predation by rats. Small population size, limited distribution, and reduced reproductive vigor makes this species

particularly vulnerable to extinction (61 FR 41020).

Pritchardia napaliensis (loulou)

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

Little is known about the life history of *Pritchardia napaliensis*. Its flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1998a).

Pritchardia napaliensis has only been known from five occurrences with 155 individuals on State-owned land in Pohakuao, Alealau, Waiahuakua, and Hoolulu Valley within the Hono o Na Pali NAR and Na Pali Coast State Park (GDSI 2000; HINHP Database 2000; K. Wood, in litt. 1999).

Pritchardia napaliensis typically grows in areas between elevations of 152 and 1,158 m (500 and 3,800 ft) in a wide variety of habitats ranging from lowland dry to diverse mesic forests dominated by *Diospyros* spp. or montane wet forests dominated by *Metrosideros polymorpha* and *Dicranopteris linearis*. Associated native plant species include *Alsinidendron lychnoides*, *Alyxia oliviformis*, *Boehmeria grandis*, *Cheirodendron trigynum*, *Cibotium* spp., *Dubautia knudsenii*, *Elaeocarpus bifidus*, *Hibiscus kokio* ssp. *saintjohnianus* (kokio), *Lipochaeta connata* var. *acris* (nehe), *Melicope peduncularis* (alani), *Nesoluma polynesianum* (keahi), *Ochrosia kauaiensis* (holei), *Phyllostegia electra* (NCN), *Pleomele aurea*, *Poa sandwicensis*, *Pouteria sandwicensis*, *Psychotria* spp., *Psydrax odorata*, *Pteralyxia kauaiensis*, *Rauvolfia sandwicensis*, *Santalum freycinetianum* var. *pyrularium*, *Stenogyne purpurea* (NCN), *Syzygium sandwicensis*, *Vaccinium dentatum*, *Wilkesia gymnoxiphium*, or *Xylosma hawaiiense* (HINHP Database 2000; Service 1998a; 61 FR 53070).

Major threats to *Pritchardia napaliensis* include habitat degradation and grazing by feral goats and pigs; seed predation by rats; and competition with nonnative plants such as *Erigeron karvinskianus*, *Kalanchoe pinnata*, *Lantana camara*, *Psidium guajava*, or possibly *Cordyline fruticosa*. The species is also threatened by vandalism

and over-collection. In 1993, near the Wailua River, the State Division of Forestry and Wildlife (DOFAW) constructed a fenced enclosure around 39 recently planted *P. napaliensis* individuals. Shortly after planting, the fence was vandalized and the 39 plants were removed. Also, because of the small number of remaining populations and individuals, this species is susceptible to a risk of extinction from naturally occurring events, such as landslides or hurricanes, and from reduced reproductive vigor (61 FR 53070; Craig Koga, DOFAW, in litt. 1999; A. Kyono, pers. comm., 2000).

Pritchardia viscosa (loulou)

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

Historically, *Pritchardia viscosa* was known only from a 1920 collection from Kalihiwai Valley. It was not seen again until 1987, when Robert Read observed it in the same general area as the type locality, off the Powerline Road at 512 m (1,680 ft) elevation (HINHP Database 2000). Currently, there is one occurrence with three individuals on State-owned land within the Halelea Forest Reserve (GDSI 2000; HINHP Database 2000; 61 FR 53070).

This species is found in *Metrosideros polymorpha*-*Dicranopteris linearis* lowland wet forest at elevations between 488 and 518 m (1,600 and 1,700 ft). Associated native species include *Antidesma* spp., *Bobea* spp., *Cibotium* spp., *Cyanea fissa*, *Cyrtandra kauaiensis*, *Cyrtandra longiflora*, *Dubautia knudsenii*, *Nothocestrum* spp., *Perrottetia sandwicensis*, *Psychotria* spp., *Sadleria pallida*, or *Syzygium sandwicensis* (Service 1998a; 61 FR 53070).

Pritchardia viscosa is threatened by *Psidium cattleianum*, nonnative grasses such as *Paspalum conjugatum*, and seed predation by rats. At least one of the remaining mature trees has been damaged by spiked boots used either by a botanist or seed collector to scale the tree. In mid-1996, a young plant and seeds from mature *Pritchardia viscosa* plants were removed from the only known location of this species. Because of this past activity, it is reasonable to assume that these plants are threatened by over-collection and vandalism. Also, because of the small numbers of individuals in the only known population, this species is susceptible to

extinction since a single naturally occurring event (e.g., a hurricane) could destroy all remaining plants (61 FR 53070; C. Koga, in litt. 1999; A. Kyono, pers. comm., 2000).

Pteralyxia kauaiensis (kaulu)

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

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

Historically, *Pteralyxia kauaiensis* was known from the Wahiawa Mountains in the southern portion of Kauai. This species is now known from 39 occurrences, with a total of 1,124 to 1,161 individuals in the following scattered locations on State land: Limahuli Valley, the left and right branches of Kalalau Valley, Pohakuao, Makaha Valley, Kuia Valley, Haeleele Valley, Koaie Canyon, Kawaiiki Valley, Hipalau, Haupu, Blue Hole, Poomau Valley, and Kapaliikea within the Lihue-Koloa Forest Reserve, Na Pali Coast State Park, Na Pali-Kona Forest Reserve, and Puu Ka Pele Forest Reserve. There is also an undocumented sighting of one individual at Makaleha, above the town of Kapaa (HINHP Database 2000; Wagner *et al.* 1999; 59 FR 9304; K. Wood, in litt. 1999).

This species is typically found in diverse mesic or *Diospyros sandwicensis* mixed mesic forests with *Pisonia* spp. between elevations of 127 and 1,563 m (418 and 5,128 ft). Associated native plant species include *Acacia koa*, *Alectryon macrococcus*, *Alphitonia ponderosa*, *Antidesma platyphyllum* var. *hillebrandii*, *Bobea brevipes*, *Carex* spp., *Charpentiera elliptica*, *Claoxylon sandwicense*, *Cyanea* spp., *Dianella sandwicensis*, *Diospyros* spp. (lama), *Diplazium sandwichiianum*, *Dodonaea viscosa*, *Euphorbia haeleeleana*, *Freycinetia arborea*, *Gahnia* spp., *Gardenia remyi* (nanu), *Hedyotis terminalis*, *Hibiscus kokio*, *Kokia kauaiensis*, *Leptecophylla tameiameia*, *Metrosideros polymorpha*, *Myrsine lanaiensis*, *Neraudia* spp. (NCN), *Nesoluma polynesicum*, *Nestegis sandwicensis*, *Peperomia* spp., *Pipturus* spp., *Pisonia sandwicensis*, *Pleomele aurea*, *Poa sandwicensis*, *Pouteria*

sandwicensis, *Pritchardia* spp., *Psychotria* spp., *Psydrax odorata*, *Rauvolfia sandwicensis*, *Santalum freycinetianum* var. *pyrarium*, *Schiedea* spp., *Syzygium sandwicensis*, *Tetraplasandra* spp., *Xylosma hawaiiense*, or *Zanthoxylum dipetalum* (HINHP Database 2000; 59 FR 9304; K. Wood, pers. comm., 2001).

The major threats to *Pteralyxia kauaiensis* are habitat destruction by feral animals and competition with introduced plants. Animals affecting the survival of this species include feral goats and pigs, and possibly rats, which may eat the fruit. Fire could threaten some populations. Introduced plants competing with this species include *Aleurites moluccana*, *Cordyline fruticosa*, *Erigeron karvinskianus*, *Lantana camara*, *Psidium cattleianum*, or *Psidium guajava* (HINHP Database 2000; Service 1995; 59 FR 9304).

Remya kauaiensis (NCN)

Remya kauaiensis, one of three species of a genus endemic to the Hawaiian Islands, is in the aster family (Asteraceae). *Remya kauaiensis* is a small short-lived perennial shrub, about 1 m (3 ft) tall, with many sprawling branches covered with a fine tan fuzz near their tips. The lower surface of the leaves is covered with fine white hairs. This species is distinguished from the other Kauai species in the genus by being hairy, having shorter flower head stalks, and having narrower tips on the floral bracts (Wagner *et al.* 1999).

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

Historically, this species was found at Koaie, Mohihi, Kalalau, Makaha, Nualolo, Kawaiula, Kuia, Honopu, Awaawapuhi, Kopakaka, and Kauhao on Kauai. There are currently 17 known occurrences with a total of 106 to 114 individuals on State-owned land. They occur in Hipalau Valley, Awini Valley, Koaie Canyon, Mohihi Stream, the left branch of Kalalau Valley, Awaawapuhi and Nualolo Valleys, Kuia and Kawaiula Valleys, Makaha Valley, Kauhao Valley, and Kaulaula Valley within the Alakai Wilderness Preserve, Kuia NAR, Na Pali Coast State Park, Na Pali-Kona Forest Reserve, Puu Ka Pele Forest Reserve, and Waimea Canyon State Park (GDSI 2000; HINHP Database 2000; K. Wood, in litt. 1999).

Remya kauaiensis grows chiefly on steep, north or northeast-facing slopes at elevations between 560 and 1,247 m

(1,836 and 4,090 ft). It is found primarily in *Acacia koa*-*Metrosideros polymorpha* lowland mesic forest with *Chamaesyce* spp. (akoko), *Claoxylon sandwicense*, *Dianella sandwicensis*, *Diospyros* spp., *Dodonaea viscosa*, *Hedyotis terminalis*, *Melicope* spp., *Nestegis sandwicensis*, *Pouteria sandwicensis*, *Psychotria* spp., *Schiedea* spp., or *Tetraplasandra* spp. (HINHP Database 2000; Herbst 1988; 56 FR 1450; K. Wood, pers. comm., 2001).

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

Remya montgomeryi (NCN)

Remya montgomeryi in the aster family (Asteraceae) was discovered in 1985 by Steven Montgomery on the sheer, virtually inaccessible cliffs below the upper rim of Kalalau Valley, Kauai. It is a small short-lived perennial shrub, about 1 m (3 ft) tall, with many sprawling to weakly erect, smooth branches. The species is distinguished from *R. kauaiensis* by being hairless, with longer flower head stalks and broader floral bract tips (Wagner *et al.* 1999).

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

Remya montgomeryi is known only from Kauai. Six occurrences with 143 individuals are reported on State-owned land in the left and right branches of Kalalau Valley, Koaie Canyon, and Kuia Valley within the Alakai Wilderness Preserve and Na Pali Coast State Park (GDSI 2000; HINHP Database 2000; Herbst 1988; K. Wood, in litt. 1999).

Remya montgomeryi grows at elevations between 336 and 1,344 m (1,102 and 4,411 ft), primarily on steep, north or northeast-facing slopes or cliffs in transitional wet or *Metrosideros polymorpha*-dominated mixed mesic forest. Associated native plant species include *Artemisia australis*, *Bobea* spp., *Boehmeria grandis*, *Cheirodendron* spp., *Claoxylon sandwicense*, *Cyrtandra* spp., *Dubautia* spp., *Ilex anomala*, *Lepidium serra*, *Lysimachia* spp. (kolokolo kuahiwi), *Myrsine linearifolia*, *Nototrichium* spp., *Pleomele aurea*, *Poa*

mannii, *Sadleria* spp., *Scaevola* spp., *Stenogyne campanulata*, *Tetraplasandra* spp., or *Zanthoxylum dipetalum* (HINHP Database 2000; K. Wood, pers. comm., 2001).

The primary threats to *Remya montgomeryi* are herbivory and habitat degradation by feral goats, pigs, cattle, and deer, and competition from nonnative plant species. Other threats include erosion, fire, and an increased risk of extinction from naturally occurring events (e.g., landslides or hurricanes) because of the small size of the populations and their limited distribution (Service 1995; 56 FR 1450).

Schiedea apokremnos (maolioli)

Schiedea apokremnos, a member of the pink family (Caryophyllaceae), is a low, branching short-lived perennial shrub 20 to 51 cm (8 to 20 in) tall with leaves that are somewhat fleshy. *Schiedea apokremnos* is distinguished from related species by shorter sepals, nectaries, and capsules (Wagner *et al.* 1999).

Some individuals of *Schiedea apokremnos* are functionally female and must be cross-pollinated to set seed. This reproductive strategy may be ineffective in populations with few individuals. Little is known about the life history of *Schiedea apokremnos*. Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1995).

Schiedea apokremnos has been collected from Nualolo Kai, Kaaweiki Ridge, and along a 10.5 km (6.5 mi) long section of the Na Pali coast including Milolii Valley, Kalalau Beach, Kaalahina and Manono Ridges, Haeleele Ridge, and as far north as Pohakuao Valley, all on the island of Kauai. There is currently a total of five occurrences containing 201 individuals on State-owned lands. The species is extant at Nakeikionaiwi, Pohakuao, Nualolo Valley, Haeleele Valley, and Kawaiiki Valley within the Na Pali Coast State Park and Puu Ka Pele Forest Reserve (GDSI 2000; HINHP Database 2000; 56 FR 49639).

Schiedea apokremnos grows in the crevices of near-vertical basalt coastal cliff faces, at elevations between 11 and 538 m (35 and 1,765 ft). The species grows in sparse dry coastal cliff shrub vegetation along with *Artemisia australis*, *Bidens* spp., *Carex meyenii*, *Chamaesyce celastroides*, *Eragrostis variabilis*, *Lepidium serra*, *Lipochaeta connata*, *Lobelia niihauensis*, *Myoporum sandwicense*, *Peperomia* spp., *Pleomele aurea*, *Psydrax odorata*, or *Wilkesia* spp. (HINHP Database 2000;

56 FR 49639; K. Wood, pers. comm., 2001).

The restriction of this species to inaccessible cliffs suggests that goat herbivory may have eliminated it from more accessible locations. The greatest current threat to the survival of *Schiedea apokremnos* is still herbivory and habitat degradation by feral goats, as well as competition from the nonnative plants *Leucaena leucocephala* and *Hyptis pectinata* (comb hyptis), and trampling by humans. Given the small size of most populations and restricted distribution, depressed reproductive vigor may be a serious threat to the species. In addition, a single environmental disturbance (such as a landslide or fire) could destroy a significant percentage of the extant individuals (Service 1995; 56 FR 49639).

Schiedea helleri (NCN)

Schiedea helleri, a member of the pink family (Caryophyllaceae), is a short-lived perennial vine. The stems are usually prostrate and at least 15 cm (6 in) long. This species is the only member of the genus on Kauai that grows as a vine (Wagner *et al.* 1999).

Three plants have been observed flowering in February. No additional life history information for this species is currently known (Service 1998a).

Schiedea helleri was originally found only at a single location at Kaholuamano over 100 years ago. There is currently a total of three occurrences with 50 to 60 individuals on State-owned land at Mohihi Stream, Nawaimaka Valley, and Mohihi-Waialae Trail within the Alakai Wilderness Preserve and Na Pali-Kona Forest Reserve (GDSI 2000; HINHP Database 2000; K. Wood, *in litt.* 1999).

Schiedea helleri is found on ridges and steep cliffs in closed *Metrosideros polymorpha*-*Dicranopteris linearis* montane wet forest, *M. polymorpha*-*Cheirodendron* spp. montane wet forest, or *Acacia koa*-*M. polymorpha* montane mesic forest at elevations between 664 and 1,361 m (2,178 and 4,464 ft). Other native plants growing in association with this species include *Broussaisia arguta*, *Cheirodendron* spp., *Cibotium* spp., *Cyanea* spp., *Dianella sandwicensis*, *Dubautia* spp., *Elaeocarpus bifidus*, *Hedyotis terminalis*, *Melicope* spp., *Myrsine* spp., *Poa sandwicensis*, *Scaevola procera*, *Syzygium sandwicensis*, or *Viola wailenalenae* (pamakani) (HINHP Database 2000; K. Wood, pers. comm., 2001).

Competition with the nonnative plant *Rubus argutus*, a risk of extinction from naturally occurring events (e.g.,

landslides or hurricanes), and reduced reproductive vigor due to the small number of extant individuals are serious threats to *Schiedea helleri* (61 FR 53070).

Schiedea kauaiensis (NCN)

Schiedea kauaiensis, a member of the pink family (Caryophyllaceae), is an erect subshrub. This short-lived perennial species is distinguished from others in this endemic Hawaiian genus by its habit, larger leaves, the hairiness of the inflorescence, the number of flowers in each inflorescence, larger flowers, and larger seeds (Wagner *et al.* 1999).

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

Historically, *Schiedea kauaiensis* was known from the northwestern side of Kauai, from Papaa to Mahanaloa. It was thought to be extinct until the five currently known occurrences in Mahanaloa and Kalalau Valleys, with a total of 22 individuals, were found. All occurrences are on State land within the Kuia NAR and Na Pali Coast State Park (GDSI 2000; HINHP Database 2000; K. Wood, *in litt.* 1999).

Schiedea kauaiensis typically grows in diverse mesic to wet *Acacia koa*-*Metrosideros polymorpha* forest on steep slopes at elevations between 117 and 1,290 m (385 and 4,232 ft). Associated native plant species include *Alphitonia ponderosa*, *Cryptocarya mannii*, *Diospyros* spp., *Dodonaea viscosa*, *Euphorbia haeleeleana*, *Exocarpos luteolus*, *Leptocophylla tameiameia*, *Microlepia strigosa*, *Nestegis sandwicensis*, *Pisonia* spp., *Peucedanum sandwicense* (makou), *Psychotria* spp., or *Psydrax odorata* (HINHP Database 2000; 61 FR 53108; K. Wood, pers. comm., 2001).

Threats to *Schiedea kauaiensis* include habitat degradation and/or destruction by feral goats, pigs, and cattle; competition from several nonnative plant species; predation by introduced slugs and snails; and a risk of extinction from naturally occurring events, such as landslides or hurricanes, and/or reduced reproductive vigor due to the low number of individuals in only two known populations. *Schiedea kauaiensis* is also potentially threatened by fire (HINHP Database 2000; Service 1998a; 61 FR 53108).

Schiedea membranacea (NCN)

Schiedea membranacea, a member of the pink family (Caryophyllaceae), is a short-lived perennial herb. This species differs from other *Schiedea* species on Kauai by having five-to seven-veined leaves and an herbaceous habit (Wagner *et al.* 1999).

Research suggests that this species largely requires outcrossing for successful germination and survival to adulthood. Pollinators for *Schiedea membranacea* are unknown, since none have been seen during the daytime, and none were observed during one set of night observations. Little else is known about the life history of *S. membranacea*. Its flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1998a).

Schiedea membranacea is currently known from the western side of the island of Kauai, on State and privately owned lands at Poopooiki Valley, Milolii Ridge, Kuia Valley, Awaawapuhi Valley, Nualolo Valley, Kahuamaa Flats, Waialae Falls, Koaie Canyon, and the right branch of Wainiha Valley. On State lands it occurs within the Alakai Wilderness Preserve, Halelea Forest Reserve, Kuia NAR, Na Pali Coast State Park, and Na Pali-Kona Forest Reserve. There are currently 10 occurrences containing 344 to 348 individuals (GDSI 2000; HINHP Database 2000; Wood and Perlman 1993; 61 FR 53070; K. Wood, *in litt.* 1999;).

This species is typically found on cliffs and cliff bases in mesic or wet habitats in lowland or montane shrubland or forest communities dominated by *Acacia koa*, *Pipturus* spp. and *Metrosideros polymorpha* or *Urticaceae* shrubland on talus slopes at elevations between 422 and 1,259 m (1,386 and 4,131 ft). Associated native plant species include *Alphitonia ponderosa*, *Alyxia oliviformis*, *Asplenium* spp., *Athyrium sandwicensis* (akolea), *Bobea brevipes*, *Boehmeria grandis*, *Cyrtandra* spp., *Diplazium sandwichianum*, *Dodonaea viscosa*, *Eragrostis variabilis*, *Hedyotis terminalis*, *Hibiscus waimeae*, *Joinvillea ascendens* ssp. *ascendens* (ohe), *Labordia helleri* (kamakahala), *Lepidium serra*, *Lysimachia kalalauensis* (NCN), *Machaerina angustifolia*, *Mariscus pennatifolius*, *Melicope* spp., *Myrsine* spp., *Perrottetia sandwicensis*, *Pisonia* spp., *Pleomele aurea*, *Poa mannii*, *Poa sandwicensis*, *Pouteria sandwicensis*, *Psychotria* spp., *Psydrax odorata*, *Remya kauaiensis*, *Sadleria cyatheoides* (amau), *Scaevola procera*, *Thelypteris*

cyatheoides (kikawaio), *Thelypteris sandwicensis* (palapalaia), or *Touchardia latifolia* (HINHP Database 2000; 61 FR 53070; K. Wood, pers. comm., 2001).

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

Schiedea spergulina var. *leiopoda* and *Schiedea spergulina* var. *spergulina* (NCN)

Schiedea spergulina, a member of the pink family (Caryophyllaceae), is a short-lived perennial subshrub. Of the 22 species in this endemic genus, only two other species have smooth seeds. *Schiedea spergulina* differs from those two in having very compact flower clusters. The two weakly defined varieties differ primarily in the degree of hairiness of the inflorescences, with *S. spergulina* var. *leiopoda* being the less hairy of the two (Wagner *et al.* 1999).

Little is known about the life histories of either *Schiedea spergulina* var. *leiopoda* or *S. spergulina* var. *spergulina*. Flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1995).

Historically, *Schiedea spergulina* var. *leiopoda* was found on a ridge on the east side of Hanapepe on Kauai. One occurrence with approximately 135 to 150 individuals is now known to grow in Lawai Valley on Kauai on privately owned land (GDSI 2000; HINHP Database 2000).

Schiedea spergulina var. *spergulina* was historically found in Olokele Canyon, but is now known only from the right branch of Kalalau Valley, Koaie Canyon, and Waimea Canyon. A total of three occurrences numbering approximately 208 individuals is reported on State-owned land within the Na Pali Coast State Park, Na Pali-Kona Forest Reserve, and the Puu Ka Pele Forest Reserve. However, it has been estimated that this species may number in the thousands on Kauai (GDSI 2000; HINHP Database 2000; Service 1995).

Both varieties of *Schiedea spergulina* are usually found on bare rock outcrops or sparsely vegetated portions of rocky cliff faces or cliff bases in diverse lowland dry to mesic forests at elevations between 21 and 90 m (69 and 294 ft) for *S. spergulina* var. *leiopoda* and elevations between 144 and 828 m (474 and 2,718 ft) for *S. spergulina* var. *spergulina*. Associated native plant species include *Acacia koa*, *Artemisia australis*, *Bidens sandwicensis*, *Carex meyenii*, *Chamaesyce celastroides*, *Dianella sandwicensis*, *Doryopteris* spp. (kumuniu), *Eragrostis variabilis*, *Erythrina sandwicensis* (wiliwili), *Gahnia* spp., *Heliotropium* spp. (ahinahina), *Lepidium serra*, *Lipochaeta connata*, *Microlepis strigosa*, *Nestegis sandwicensis*, *Nototrichium sandwicense*, *Panicum lineale*, *Peucedanum sandwicense*, or *Wilkesia gymnoxiphium* (HINHP Database 2000; Lorence and Flynn 1991; Service 1995; 59 FR 9304; K. Wood, pers. comm., 2001).

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

Schiedea spergulina var. *spergulina* is threatened by competition with nonnative plant species, including *Erigeron karvinskianus*, *Lantana camara*, *Melia azedarach*, or *Triumfetta semitriloba* (Sacramento bur). The area in which this variety grows is used heavily by feral goats, and there is evidence that plants are being browsed and trampled (HINHP Database 2000; Lorence and Flynn 1991; 59 FR 9304).

Schiedea stellarioides (lauilihilihi)

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

Plants have been observed flowering in February. Little else is known about the life history of *Schiedea stellarioides*. Its flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1995).

Historically, *Schiedea stellarioides* was found at the sea cliffs of Hanakapiai Beach, Kaholuamano-Opaewela region, the ridge between Waialae and Nawaimaka Valleys, and Haupu Range on the island of Kauai. Currently it is found in Kawaiiki Valley and Waialae Falls within the Na Pali-Kona Forest Reserve. There is a total of three occurrences with 1,500 individuals on State-owned land (GDSI 2000; HINHP Database 2000; K. Wood, *in litt.* 1999).

Schiedea stellarioides is found on steep slopes in closed *Acacia koa*-*Metrosideros polymorpha* lowland to montane mesic forest or shrubland at elevations between 376 and 1,251 m (1,135 and 4,102 ft). Associated native plant species include *Alsinidendron viscosum*, *Artemisia australis*, *Bidens cosmoides*, *Chenopodium* spp. (aheahea), *Dianella sandwicensis*, *Dodonaea viscosa*, *Leptecophylla tameiameia*, *Mariscus* spp., *Melicope* spp., *Nototrichium sandwicense*, *Pipturus* spp., *Syzygium sandwicensis*, or *Zanthoxylum dipetalum* (HINHP Database 2000; 61 FR 53070; K. Wood, pers. comm., 2001).

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

Stenogyne campanulata (NCN)

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

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

Stenogyne campanulata is known from three occurrences with 66 individuals which were originally

discovered in the left branch of Kalalau Valley on State-owned land in the Na Pali Coast State Park (GDSI 2000; HINHP Database 2000).

Stenogyne campanulata grows on the rock face of a nearly vertical, north-facing cliff in diverse lowland or montane mesic forest at elevations between 335 and 1,290 m (1,100 and 4,232 ft). The associated native plant species include *Lepidium serra*, *Lobelia niihauensis*, *Lysimachia* spp., *Melicope pallida*, *Metrosideros polymorpha*, *Neraudia kauaiensis*, *Nototrichium divaricatum* (kului), *Poa mannii*, *Remya montgomeryi*, or *Wilkesia gymnoxiphium* (Weller and Sakai 1999; 57 FR 20580; K. Wood, pers. comm., 2001).

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

Viola helenae (NCN)

Viola helenae is a small, unbranched perennial subshrub with an erect stem in the violet family (Violaceae). It is distinguished from other Kauai species of *Viola* by the leaf shape and width, woody stems, and strictly chasmogamous (open at maturity for access by pollinators) flowers (Wagner *et al.* 1999).

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

are jettisoned when the capsule splits open, as in most species of the genus (Service 1994).

Historically, *Viola helenae* was known from four populations, two along either branch of Wahiawa Stream on Kauai. Currently, there is one known occurrence with a total of 137 plants, on privately owned land within the Wahiawa drainage (GDSI 2000; HINHP Database 2000; Service 1994; 56 FR 47695).

This species is found in *Metrosideros polymorpha*-*Dicranopteris linearis* lowland wet forest or *M. polymorpha*-*Cheirodendron* wet forest growing on stream drainage banks or adjacent valley bottoms in light to moderate shade at elevations between 522 and 1,006 m (1,712 and 3,301 ft). Associated native plant species include *Antidesma platyphyllum* var. *hillebrandii*, *Broussaisia arguta*, *Dicranopteris linearis*, *Diplazium sandwichianum*, *Dubautia* spp., *Freycinetia arborea*, *Hesperomannia lydgatei*, *Melicope* spp., or *Pritchardia* spp. (HINHP Database 2000; Service 1994; K. Wood, pers. comm., 2001).

Threats to *Viola helenae* include competition from nonnative plant species, including *Elephantopus mollis*, *Erechtites valerianifolia*, *Melastoma candidum*, *Psidium cattleianum*, *Rubus rosifolius*, *Stachytarpheta australis*, various nonnative grasses, or potentially *Melaleuca quinquenervia*; trampling and browsing damage by feral pigs; landslides and erosion; and hurricanes (Service 1994; 56 FR 47695).

Viola kauaiensis var. *wahiawaensis* (nani waialeale)

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

Viola kauaiensis var. *wahiawaensis* has been observed in flower in December. Little else is known about the life history of *V. kauaiensis* var. *wahiawaensis*. Its flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1998a).

Viola kauaiensis var. *wahiawaensis* is known only from two occurrences in the Wahiawa Mountains of Kauai with a total of 13 individual plants, on privately owned land. This taxon is not known to have occurred beyond its current range (GDSI 2000; HINHP Database 2000).

Viola kauaiensis var. *wahiawaensis* is found in *Machaerina angustifolia*-*Rhynchospora rugosa* (kuolohia) lowland bog or mixed wet shrubland and adjacent *Metrosideros polymorpha* wet forest at elevations between 393 and 1,006 m (1,291 and 3,301 ft). Associated native plant species include *Antidesma platyphyllum* var. *hillebrandii*, *Bidens forbesii* (kookoolau), *Chamaesyce remyi* (akoko), *Chamaesyce sparsiflora* (akoko), *Coprosma* spp., *Cyanea fissa*, *Dicranopteris linearis*, *Diplopterygium pinnatum* (uluhe lau nui), *Dubautia imbricata* (naenae), *Dubautia railardioides*, *Gahnia vitiensis* (NCN), *Leptechophylla tameiameia*, *Lobelia kauaensis* (NCN), *Machaerina angustifolia*, *Machaerina mariscoides*, *Melicope* spp., *Psychotria wawrae*, *Sadleria pallida*, *Scaevola gaudichaudii*, *Sphenomeris chinensis*, *Syzygium sandwicensis*, *Tetraplasandra oahuensis*, or *Vaccinium dentatum* (HINHP Database 2000; Lorence and Flynn 1991; Service 1998a; 61 FR 53070; K. Wood, pers. comm., 2001).

The primary threats to *Viola kauaiensis* var. *wahiawaensis* are a risk of extinction from naturally occurring events, such as landslides or hurricanes, and reduced reproductive vigor due to the small number of existing populations and individuals; habitat degradation through the rooting activities of feral pigs; and competition with nonnative plants, such as *Juncus planifolius* (NCN) or *Pterolepis glomerata* (NCN) (HINHP Database 2000; Lorence and Flynn 1991; Service 1994; 61 FR 53070).

Wilkesia hobdyi (dwarf iliau)

Wilkesia hobdyi, a member of an endemic Hawaiian genus in the aster family (Asteraceae), is a short-lived perennial shrub which branches from the base. The tip of each branch bears a tuft of narrow leaves growing in whorls joined together into a short sheathing section at their bases. The cream-colored flower heads grow in clusters. It is distinguished from the other species of *Wilkesia* by having shorter branched stems and fewer shorter leaves per whorl (Carr 1982a, 1999b).

This species is probably pollinated through outcrossing and is probably self-incompatible. Insects are the most likely pollinators. In 1982, Carr reported

that reproduction and seedling establishment were occurring and appeared sufficient to sustain the populations. Flowering has been observed most often in the winter months, but also during June. Fruits may be dispersed when they stick to the feathers of birds. Densities reach one plant per sq m (approximately one sq yard) in localized areas, and hybridization with *Wilkesia gymnoxiphium* may be occurring (Carr 1982a).

First collected in 1968 on Polihale Ridge, Kauai, this species was not formally described until 1971 (St. John 1971). Currently, there are nine occurrences with a total of 406 to 471 individuals. This species occurs on State-owned lands within the Hono o Na Pali NAR, Na Pali Coast State Park, and Puu Ka Pele Forest Reserve and on land under Federal jurisdiction within the Pacific Missile Range Facility (PMRF) at Makaha Ridge. The plants occur in Milolii Valley, Makaha Ridge, Haeleele Ridge, Kaaweiki Ridge, Polihale Spring, Pohakumano, and Pohakuao (GDSI 2000; HINHP Database 2000).

Wilkesia hobdyi grows on coastal dry cliffs or very dry ridges at elevations between 12 and 685 m (40 and 2,246 ft). The associated native plant species include *Artemisia australis*, *Dodonaea viscosa*, *Eragrostis variabilis*, *Hibiscus kokio* ssp. *saint johnianus*, *Lipochaeta connata*, *Lobelia niihauensis*, *Myoporum sandwicense*, *Peperomia blanda* (ala ala wai nui), *Peperomia tetraphylla* (ala ala wai nui), *Peperomia* spp., *Peucedanum sandwicense*, *Psydrax odorata*, *Sida fallax*, *Waltheria indica* (uhaloa), or *Wilkesia gymnoxiphium* (Service 1995; Wagner *et al.* 1999; 57 FR 27859; K. Wood, pers. comm., 2001).

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

Xylosma crenatum (NCN)

Xylosma crenatum is a dioecious (plant bears only male or female flowers, and must cross-pollinate with another plant to produce viable seed) long-lived perennial tree in the

flacourtia family (Flacourtiaceae). The tree grows up to 14 m (45 ft) tall and has dark gray bark. More coarsely toothed leaf edges and hairy undersides of the leaves distinguish *X. crenatum* from the other Hawaiian member of this genus (Wagner *et al.* 1999).

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

Historically, *Xylosma crenatum* was known from three occurrences on Kauai: along upper Nualolo Trail and along Mohihi Road between Waiakoali and Mohihi drainages. Currently, this species is extant on State-owned land in Kainamanu, Nualolo Trail, and Mohihi Valley within Kokee State Park, Kuia NAR, and Na Pali-Kona Forest Reserve. There are three occurrences with a total of 16 individual plants (GDSI 2000; HINHP Database 2000; Service 1995; 57 FR 20580).

Xylosma crenatum is known from diverse *Acacia koa*-*Metrosideros polymorpha* montane mesic or wet forest, or *M. polymorpha*-*Dicranopteris linearis* montane wet forest, at elevations between 936 and 1,284 m (3,070 and 4,212 ft). Associated native plant species include *Athyrium sandwicensis*, *Cheirodendron* spp., *Claoxylon sandwicense*, *Coprosma* spp., *Cyanea* spp. (haha), *Diplazium sandwichianum*, *Dubautia knudsenii*, *Hedyotis* spp., *Ilex anomala*, *Lobelia yuccoides*, *Myrsine* spp., *Nestegis sandwicensis*, *Perrottetia sandwicensis*, *Pleomele aurea*, *Poa sandwicensis*, *Pouteria sandwicensis*, *Psychotria* spp., *Scaevola procera*, *Streblus pendulinus*, *Tetraplasandra* spp., *Touchardia latifolia*, or *Zanthoxylum dipetalum* (HINHP Database 2000; Service 1995; 57 FR 20580; K. Wood, pers. comm., 2001).

The small number of individuals and scattered distribution make this species vulnerable to human or natural environmental disturbance. *Xylosma crenatum* is also threatened by competition from nonnative plants, particularly *Psidium guajava*. In addition, feral pigs may threaten this species (HINHP Database 2000; Service 1995; 57 FR 20580).

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 distinguished from the other Hawaiian rose family members by its lack of petals and by its urn-

shaped, constricted receptacle (top of flower stem where floral parts are attached) that encloses the carpels (ovule-bearing floral part) (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).

Historically, *Acaena exigua* was known from Puu Kukui on West Maui and from Mount Waialeale on Kauai. On Kauai, *A. exigua* was last collected between 1869 and 1870, and has not been seen in the wild since (Wagner *et al.* 1999).

Acaena exigua is known only from sites with extensive cloud cover and moderate to strong winds in wet montane shrub bog or bog margins characterized by a thick peat substrate overlying an impervious clay substrate, with hummocks of sedges and grasses, stunted trees, and shrubs and elevations between 666 and 1,598 m (2,185 and 5,244 ft). Associated native plant species include *Deschampsia nubigena* (hair grass), *Dichanthelium cynodon* (NCN), *Dichanthelium hillebrandianum* (NCN), *Dichanthelium isachnoides* (NCN), *Dubautia* spp., *Melicope* spp., *Metrosideros polymorpha*, *Oreobolus furcatus* (NCN), or *Vaccinium* spp. (K. Wood, pers. comm., 2001).

The reason for the disappearance of this species is not known. Although impacts from herbivory and rooting by pigs are assumed and often cited, feral pigs have become established at Waialeale (Kauai) only within the past two decades. The main current threats to *Acaena exigua*, if it exists, are believed to include small population size; human impacts (collecting and site degradation); potentially consumption of vegetative or floral parts of this species by nonnative slugs and/or rats; predation and habitat disturbance by feral pigs; and nonnative plant species, especially *Juncus planifolius* (57 FR 20772).

Achyranthes mutica (NCN)

Achyranthes mutica, a member of the amaranth family (Amaranthaceae) and a short-lived perennial, is a many-branched shrub with egg-shaped leaves and stalkless flowers. This species is distinguished from others in the genus by the shape and size of the sepals and by characteristics of the spike, which is short and congested (Wagner *et al.* 1999).

Historically, *Achyranthes mutica* was known from three collections from opposite ends of the main archipelago:

Kauai and Hawaii. Currently, this species is known only from Hawaii Island, from Kilohana Gulch on private land. It was last observed on Kauai in the 1850s (GDSI 2000; HINHP Database 2000; 61 FR 53108).

Nothing is known of the preferred habitat of or native plant species associated with *Achyranthes mutica* on the island of Kauai.

Nothing is known of the threats to *Achyranthes mutica* on the island of Kauai.

Adenophorus periens (pendent kihi fern)

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

Little is known about the life history of *Adenophorus periens*, which seems to grow only in closed canopy dense forest with high humidity. Its breeding system is unknown, but outbreeding is very likely to be the predominant mode of reproduction. Spores are dispersed by wind, possibly by water, and perhaps on the feet of birds or insects. Spores lack a thick resistant coat which may indicate their longevity is brief, probably measured in days at most. Due to the weak differences between the seasons, 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 several locations on Kauai, Molokai, and Hawaii (HINHP Database 2000). On Kauai, there is a total of seven occurrences on private and State-owned lands (Halelea Forest Reserve, Hono o Na Pali NAR, and Kealia Forest Reserve), with approximately 59 individuals, that occur at Pihea, Pali Elele, Waioli Valley, Mount Namahana, Lumahai Valley, Wainiha Valley, and Kapalaoa (GDSI 2000; HINHP Database 2000; 59 FR 56333;).

This epiphytic species usually growing on *Metrosideros polymorpha* trunks, is found in riparian banks of stream systems in well-developed, closed canopy that provides deep shade or high humidity in *M. polymorpha*-

Cibotium glaucum lowland wet forests, open *M. polymorpha* montane wet forest, or *M. polymorpha-Dicranopteris linearis* lowland wet forest at elevations between 107 and 1,593 m (351 and 5,228 ft). Associated native plant species include *Antidesma platyphyllum*, *Athyrium sandwichianum*, *Broussaisia arguta*, *Cheirodendron trigynum*, *Cyanea* spp., *Cyrtandra* spp., *Dicranopteris linearis*, *Freycinetia arborea*, *Hedyotis terminalis*, *Labordia hirtella*, *Machaerina angustifolia*, *Psychotria hexandra*, *Psychotria* spp., *Syzygium sandwicensis*, or *Tetraplasandra oahuensis* (Linney 1989; 59 FR 56333; K. Wood, pers. comm., 2001).

The threats to this species on Kauai include habitat degradation by feral pigs and goats and competition with the nonnative plant *Psidium cattleianum* (HINHP Database 2000; 59 FR 56333).

Alectryon macrococcus var. *macrococcus* (mahoe)

Alectryon macrococcus, a member of the soapberry family (Sapindaceae), consists of two varieties, *macrococcus* and *auwahiensis*, both trees with reddish-brown branches and 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* plants. The only member of its genus found in Hawaii, this species is distinguished from other Hawaiian members of its family by being a tree with a hard fruit 2.3 cm (0.9 in) or more in diameter (Wagner *et al.* 1999).

Alectryon macrococcus is a relatively slow-growing, long-lived tree that grows in xeric to mesic sites and is adapted to periodic drought. Little else is known about the life history of *Alectryon macrococcus*. Flowering cycles, pollination vectors, seed dispersal agents, longevity, and specific environmental requirements are unknown (Service 1997).

Alectryon macrococcus var. *macrococcus* historically and currently occurs on Kauai, Oahu, Molokai and Maui. On Kauai, *A. macrococcus* var. *macrococcus* occurs on State-owned land in the Alakai Wilderness Preserve, Na Pali Coast State Park, Na Pali-Kona Forest Reserve, and Puu Ka Pele Forest Reserve. A total of 18 occurrences of 159 to 174 individuals is known from Kalalau Valley, Kipalau Valley, Haeleele Valley, Waimea Canyon, Hipalau Valley, and Kawaiiki Falls (GDSI 2000; K. Wood, *in litt.* 1999). *Alectryon macrococcus* var. *auwahiensis* is found

only on leeward east Maui (HINHP Database 2000; Medeiros *et al.* 1986).

The habitat of *Alectryon macrococcus* var. *macrococcus* on Kauai is *Diospyros* spp.-*Metrosideros polymorpha* lowland mesic forest, *M. polymorpha* mixed mesic forest, or *Diospyros* spp. mixed mesic forest on dry slopes or in gulches, at elevations between 341 and 954 m (1,120 and 3,129 ft). Associated native plant species include *Acacia koa*, *Alyxia oliviformis*, *Antidesma* spp., *Bobea timonioides*, *Caesalpinia kavaense* (uhiuhi), *Canavalia* spp. (awikiwiki), *Carex meyenii*, *Carex wahuensis*, *Doodia kunthiana*, *Hibiscus waimeae*, *Kokia kauaiensis*, *Melicope knudsenii* (alani), *Microlepia strigosa*, *Munroidendron racemosum*, *Myrsine lanaiensis*, *Nesoluma polynesicum*, *Nestegis sandwicensis*, *Pisonia* spp., *Pleomele aurea*, *Pouteria sandwicensis*, *Psychotria* spp., *Psydrax odorata*, *Pteralyxia kauaiensis*, *Rauvolfia sandwicensis*, *Streblus pendulinus*, *Tetraplasandra* spp., *Xylosma* spp., or *Zanthoxylum* spp. (HINHP Database 2000; 57 FR 20772; K. Wood, pers. comm., 2001).

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

Bonamia menziesii (NCN)

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

Little is known about the life history of *Bonamia menziesii*. Its flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1999).

Historically, *Bonamia menziesii* was known from the following general areas: scattered locations on Kauai, the Waianae Mountains of Oahu, scattered locations on Molokai, one location on

West Maui, and eastern Hawaii.

Currently, it is known from Kauai, Oahu, Lanai, Maui, and Hawaii. On Kauai, there are nine occurrences with 36 individuals on State (Alakai Wilderness Preserve, Hono o Na Pali NAR, Lihue-Koloa Forest Reserve, Na Pali Coast State Park, and Na Pali-Kona Forest Reserve) and privately owned lands in Waiahuakua, Kalalau Valley, Awaawapuhi Valley, Paaiki Valley, Kipalau Valley, Hulua, Wahiawa Falls, and Laauhihaihai (GDSI 2000; HINHP Database 2000; Service 1999; K. Wood, *in litt.* 1999).

Bonamia menziesii is found in dry, mesic, or wet *Metrosideros polymorpha*-*Cheirodendron-Dicranopteris* forest at elevations between 351 and 1,415 m (1,151 and 4,644 ft). Associated native plant species include *Acacia koa*, *Alphitonia ponderosa*, *Antidesma platyphyllum*, *Cyanea* spp., *Cyrtandra limahuliensis*, *Cyrtandra pickeringii*, *Dianella sandwicensis*, *Diospyros sandwicensis*, *Dodonaea viscosa*, *Dubautia knudsenii*, *Hedyotis terminalis*, *Isodendron longifolium*, *Labordia hirtella*, *Melicope anisata*, *Melicope barbiger* (uahiapele), *Myoporum sandwicense*, *Nestegis sandwicensis*, *Pisonia* spp., *Pittosporum* spp., *Pouteria sandwicensis*, *Psychotria hexandra*, *Psychotria mariniana*, *Psydrax odorata*, *Sapindus oahuensis*, *Scaevola procera*, or *Syzygium sandwicensis* (HINHP Database 2000; Service 1999; K. Wood, pers. comm., 2001).

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

Centaurium sebaeoides (awiwi)

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

Centaurium sebaeoides has been observed flowering in April. It is possible that heavy rainfall induces flowering. Populations are found in dry areas, and plants are more likely to be found following heavy rains. Little else is known about the life history of *C. sebaeoides*. Its flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1999).

Historically and currently, *Centaurium sebaeoides* is known from scattered localities on the islands of Kauai, Oahu, Molokai, Lanai, and Maui. Currently on Kauai, there are a total of three occurrences with approximately 22 to 52 individuals on State-owned land. This species is found at Punaiea Point, the caves at Nakeikionaiwi, and Pohakuao within the Na Pali Coast State Park (GDSI 2000; HINHP Database 2000).

Centaurium sebaeoides typically grows in volcanic or clay soils or on cliffs in arid coastal areas at elevations between 0 and 147 m (0 and 483 ft). Associated native plant species include *Artemisia* spp. (hinahina), *Bidens* spp., *Chamaesyce celastroides*, *Cyperus phleoides*, *Dodonaea viscosa*, *Fimbristylis cymosa* (mauu akiaki), *Heteropogon contortus*, *Jacquemontia ovalifolia* (pauohiika), *Lipochaeta* spp., *Lycium sandwicense*, *Lysimachia mauritiana* (kolokolo kuahiwi), *Melanthera integrifolia* (nehe), *Panicum fauriei* (NCN), *P. torridum* (kakonakona), *Scaevola sericea*, *Sida fallax*, or *Wikstroemia uva-ursi* (akia) (56 FR 55770; K. Wood, pers. comm., 2001).

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

Ctenitis squamigera (pauoa)

Ctenitis squamigera is a short-lived perennial fern of the spleenwort family (Aspleniaceae). *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 1998c).

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. It was last seen on Kauai in 1896 (HINHP Database 2000).

This species is found on rock faces in gulches in the forest understory at

elevations between 538 and 1,069 m (1,765 and 3,507 ft), in *Metrosideros polymorpha-Diospyros* spp. mesic forest and diverse mesic forest. Associated native plant species include *Myrsine* spp., *Psychotria* spp., and *Xylosma* spp. (HINHP Database 2000; Service 1998a; K. Wood, pers. comm., 2001).

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

Cyperus trachysanthos (puukaa)

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

Little is known about the life history of *Cyperus trachysanthos*. Its flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1999).

Historically, *Cyperus trachysanthos* was known on Niihau, Kauai, and scattered locations on Oahu, Molokai, and Lanai. It was last observed on Molokai in 1912 and on Lanai in 1919. Currently, this species is reported from Nualolo Valley on Kauai on State-owned land and west of Mokouia Valley on the privately owned island of Niihau. There is one known occurrence with about 300 individuals on the island of Kauai and an unknown number of individuals on Niihau (GDSI 2000; HINHP Database 2000).

Cyperus trachysanthos is usually found in wet sites (mud flats, wet clay soil, or wet cliff seeps) on seepy flats or talus slopes at elevations between 0 and 235 m (0 and 771 ft). *Talipariti tiliaceum* (hau) is often found in association with this species (Koyama 1999; 61 FR 53108; K. Wood, pers. comm., 2001).

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

Delissea undulata (NCN)

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

On the island of Hawaii, *Delissea undulata* ssp. *undulata* has been observed in flower and fruit (immature) in August and outplanted individuals have been observed in flower in July. Little else is known about the life history of *Delissea undulata*. Its flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1996; 61 FR 53124).

Historically and currently, *Delissea undulata* ssp. *kauaiensis* is known only from Kauai. Currently, there is one known occurrence of three individuals on State-owned land in Kuia Valley within the Kuia NAR. *Delissea undulata* ssp. *niihauensis* was known only from Niihau, but has not been seen since 1865. *Delissea undulata* ssp. *undulata* was known from southwestern Maui and western Hawaii. Currently, this variety occurs only on the island of Hawaii (GDSI 2000; HINHP Database 2000; Lammers 1999; 61 FR 53124; K. Wood, in litt. 1999).

Delissea undulata ssp. *kauaiensis* occurs in dry or open *Acacia koa*-*Metrosideros polymorpha* mesic forests or *Alphitonia ponderosa* montane forest at elevations between 139 and 1,006 m (456 and 3,299 ft). Associated native species include *Diospyros sandwicensis*, *Dodonaea viscosa*, *Doodia kunthiana*, *Eragrostis variabilis*, *Euphorbia haeleeleana*, *Kokia kauaiensis*, *Microlepia strigosa*, *Panicum* spp., *Pleomele aurea*, *Psychotria greenwelliae*, *Psychotria mariniana*, and *Santalum freycinetianum* (K. Wood, pers. comm., 2001).

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

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 large brown or dark gray scales, fused or separate sori along both margins of the pinna, shiny black midribs that have a hardened surface, and veins that do not usually encircle the sori (Degener and Greenwell 1950; Wagner 1952).

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

Historically, *Diellia erecta* was known on Kauai, Oahu, Molokai, Lanai, scattered locations on Maui, and various locations on the island of Hawaii. Currently, it is known from Molokai, Maui, and Hawaii and has recently been rediscovered on Kauai. On Kauai there is one known occurrence with 30 individuals in Kawaiiki Valley on State-owned land within the Na Pali-Kona Forest Reserve (Service 1999; HINHP Database 2000).

This species is found in brown granular soil with leaf litter and occasional terrestrial moss on north-facing slopes in deep shade on steep slopes or gulch bottoms in *Metrosideros polymorpha*-*Dicranopteris linearis* wet forest or *M. polymorpha* mixed mesic forest with *Acacia koa* and *Acacia koaia* as co-dominants, at elevations between 655 and 1,224 m (2,149 and 4,016 ft). Associated native plant species include *Asplenium aethiopicum* (NCN), *Asplenium contiguum* (NCN), *Asplenium macraei* (NCN), *Coprosma* spp., *Dodonaea viscosa*, *Dryopteris fusco-atra* (ii), *Dryopteris unidentata*, *Hedyotis terminalis*, *Leptecophylla tameiameia*, *Melicope* spp., *Microlepia strigosa*, *Myrsine* spp., *Nestegis sandwicensis*, *Psychotria* spp., *Syzygium sandwicensis*, or *Wikstroemia* spp. (HINHP Database 2000; Service 1999; K. Wood, pers. comm., 2001).

The major threats to *Diellia erecta* on Kauai are habitat degradation by pigs and goats; competition with nonnative

plant species, including *Blechnum occidentale*, *Cyperus meyenianus* (NCN), *Grevillea robusta* (silk oak), *Lantana camara*, *Morella faya*, *Passiflora tarminiana*, *Rubus argutus*, or *Setaria palmifolia* (palm grass); and random naturally occurring events that could cause extinction and/or reduced reproductive vigor due to the small number of existing individuals (Service 1996; 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*. Its reproductive cycles, dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1998c).

Historically, *Diplazium molokaiense* was found on Kauai, Oahu, Molokai, Lanai, and Maui. Currently, this species is only known from Maui. It was last seen on Kauai in 1909 (HINHP Database 2000).

This species occurs in brown soil with basalt outcrops near waterfalls in lowland or montane mesic *Metrosideros polymorpha*-*Acacia koa* forest at elevations between 476 and 1,284 m (1,562 and 4,212 ft) (HINHP Database 2000; Service 1998a; K. Wood, pers. comm., 2001).

The primary threats on Kauai are habitat degradation by feral goats and pigs and competition with nonnative plant species (HINHP Database 2000; Service 1998a; 59 FR 49025).

Euphorbia haeleeleana (akoko)

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

Individual trees of *Euphorbia haeleeleana* bear only male or female flowers, and must be cross-pollinated from a different tree to produce viable seed. *Euphorbia haeleeleana* sets fruit between August and October. Little else is known about the life history of this species. Reproductive cycles, longevity,

specific environmental requirements, and limiting factors are unknown (Service 1999; Wagner *et al.* 1999).

Euphorbia haeleeleana is known historically and currently from northwestern Kauai and the Waianae Mountains of Oahu. On Kauai, there is a total of 23 occurrences with 597 individuals occurring on State-owned land. It is found at Pohakuao, Kalalau Valley, Hipalau Valley, Koaie Canyon, Mahanaloa Valley, Kuia Valley, Poopooiki Valley, Nualolo Trail, Makaha Valley, and Haeleele Valley within the Kuia NAR, Na Pali Coast State Park, Na Pali-Kona Forest Reserve, and Puu Ka Pele Forest Reserve (HINHP Database 2000; Service 1999; 61 FR 53108; K. Wood, *in litt.* 1999;).

Euphorbia haeleeleana is usually found in lowland mixed mesic or dry *Diospyros* forest that is often codominated by *Metrosideros polymorpha* and *Alphitonia ponderosa*. This plant is typically found at elevations between 284 and 1,178 m (931 and 3,866 ft). Associated native plant species include *Acacia koa*, *Antidesma platyphyllum*, *Carex meyenii*, *Carex wahuensis*, *Claoxylon sandwicense*, *Diplazium sandwichianum*, *Dodonaea viscosa*, *Erythrina sandwicensis*, *Kokia kauaiensis*, *Pisonia sandwicensis*, *Pleomele aurea*, *Pouteria sandwicensis*, *Psychotria greenwelliae*, *Psychotria mariniana*, *Pteralyxia kauaiensis*, *Rauvolfia sandwicensis*, *Sapindus oahuensis*, *Tetraplasandra kawaiensis*, or *Xylosma* spp. (61 FR 53108; K. Wood, pers. comm., 2001).

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

Flueggea neowawraea (mehamehame)

Flueggea neowawraea, a member of the spurge family (Euphorbiaceae), is a large dioecious tree with white oblong pores covering its scaly, pale brown bark. This long-lived perennial species is the only member of the genus found in Hawaii and can be distinguished from 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 this species. Reproductive cycles, longevity, specific environmental requirements, and

limiting factors are unknown (Hayden 1999).

Historically, *Flueggea neowawraea* was known from Kauai, Oahu, Maui, Molokai, and the island of Hawaii. Currently, it is known from Kauai, Oahu, east Maui, and Hawaii. On Kauai, this species is reported from Limahuli Valley, Pohakuao, the left branch of Kalalau Valley, Kuia and Paaiki Valleys, Kipalau Valley, Koaie Falls, Kawaiiki Valley, and Waimea Canyon. There are 10 occurrences with 62 known individuals occurring on State (Alakai Wilderness Preserve, Na Pali Coast State Park, and Na Pali-Kona Forest Reserve) and privately owned lands. However, it has been estimated that the total number of individuals may be slightly over 100 (GDSI 2000; HINHP Database 2000; Hayden 1999; Service 1999; K. Wood, *in litt.* 1999).

Flueggea neowawraea occurs in dry or mesic forests at elevations between 210 and 1,178 m (689 and 3,865 ft). Associated native plant species include *Alectryon macrococcus*, *Antidesma platyphyllum*, *Bidens sandwicensis*, *Bobea timonioides*, *Caesalpinia kawaiensis*, *Charpentiera* spp., *Diospyros* spp., *Diplazium sandwichianum*, *Freycinetia arborea*, *Hibiscus* spp., *Isodendron laurifolium*, *Kokia kauaiensis*, *Melicope* spp., *Metrosideros polymorpha*, *Munroidendron racemosum*, *Myrsine lanaiensis*, *Nesoluma polynesianum*, *Nestegis sandwicensis*, *Tetraplasandra* spp., *Pittosporum* spp., *Pouteria sandwicensis*, *Pritchardia minor*, *Psychotria* spp., *Psydrax odorata*, *Pteralyxia kauaiensis*, *Rauvolfia sandwicensis*, *Streblus pendulinus*, *Xylosma crenatum*, or *Xylosma hawaiiense* (HINHP Database 2000; Service 1999; 59 FR 56333; K. Wood, pers. comm., 2001).

The threats to this species on Kauai include the black twig borer; habitat degradation by feral pigs, goats, deer, and cattle; competition with nonnative plant species; fire; small population size; depressed reproductive vigor; and a potential threat of fruit predation by rats (HINHP Database 2000; Service 1999; 59 FR 56333).

Gouania meyenii (NCN)

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

Gouania meyenii flowers from March to May. Seed capsules develop in about 6 to 8 weeks. Plants appear to live about 10 to 18 years in the wild. Little else is known about the life history of *Gouania meyenii*. Its flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1998b).

Historically, *Gouania meyenii* was known only from Oahu. It was discovered on Kauai in 1993. Currently, this species is found on Oahu and on Kauai on State-owned land within the Na Pali Coast State Park and the Na Pali-Kona Forest Reserve. There is a total of three occurrences on Kauai with nine individuals found in Kalalau and Hipalau valleys (GDSI 2000; HINHP Database 2000; Wagner *et al.* 1999; 56 FR 55770).

This species typically grows on rocky ledges, cliff faces, and ridge tops in dry shrubland or *Metrosideros polymorpha* lowland diverse mesic forest at elevations between 375 and 1,179 m (1,231 and 3,867 ft). Associated native plant species include *Bidens* spp., *Carex meyenii*, *Chamaesyce* spp., *Diospyros* spp., *Dodonaea viscosa*, *Eragrostis variabilis*, *Euphorbia haelealeana*, *Hedyotis* spp., *Hibiscadelphus* spp., *Lysimachia* spp., *Melicope pallida*, *Neraudia kauaiensis*, *Nestegis sandwicensis*, *Nototrichium divaricatum*, *Panicum lineale*, *Poa mannii*, *Psychotria* spp., *Senna gaudichaudii* (kolomona), or *Wilkesia gymnoxiphium* (HINHP Database 2000; 56 FR 55770; K. Wood, pers. comm., 2001).

Threats to *Gouania meyenii* on Kauai include competition from the nonnative plants *Melinis minutiflora*, *Psidium cattleianum*, or *Schinus terebinthifolius*; fire; habitat degradation by feral pigs and goats; and the small number of extant populations and individuals (Service 1998b; 56 FR 55770).

Hedyotis cookiana (awiwi)

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

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

Historically, *Hedyotis cookiana* was known from the islands of Hawaii, Kauai, Molokai, and Oahu. Currently, it is only known from one occurrence of 60 to 80 individuals on State-owned land within Hono O Na Pali NAR in Waiahuakua Valley on Kauai (GDSI 2000; HINHP Database 2000).

This species generally grows in streambeds or on steep cliffs close to water sources in relict *Metrosideros polymorpha* lowland mesic and lowland wet forest communities at elevations between 119 and 553 m (392 and 1,814 ft). Associated native plant species include *Boehmeria grandis*, *Chamaesyce celastroides* var. *hanapepensis*, *Hibiscus kokio* ssp. *saintjohnianus*, *Machaerina angustifolia*, *Nototrichium sandwicense*, *Pipturus kauaiensis* (mamaki), *Pleomele aurea*, *Pouteria sandwicensis*, *Psydrax odorata*, or *Rauvolfia sandwicensis* (Wagner *et al.* 1999; K. Wood, pers. comm., 2001).

The threats to this species on Kauai are risk of extinction from naturally occurring events, such as landslides or hurricanes, and/or reduced reproductive vigor due to the small number of individuals in the only known population; flooding; competition with nonnative plants; and habitat modification by feral pigs and goats (HINHP Database 2000; Service 1995; 59 FR 9304).

Hibiscus brackenridgei (mao hau hele)

Hibiscus brackenridgei, a short-lived perennial and a member of the mallow family (Malvaceae), is a sprawling to erect shrub or small tree. This species differs from other members of the genus in having the following combination of characteristics: yellow petals, a calyx consisting of triangular lobes with raised veins and a single midrib, bracts attached below the calyx, and thin stipules that fall off, leaving an 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 this plant. Pollination biology, longevity, specific environmental requirements, and limiting factors are unknown (Service 1999).

Historically, *Hibiscus brackenridgei* was known from the islands of Kauai, Oahu, Lanai, Maui, Molokai, Hawaii, and possibly Kahoolawe. Currently, *Hibiscus brackenridgei* ssp.

mokuleianus is only known from Oahu. *Hibiscus brackenridgei* ssp. *brackenridgei* is currently known from Lanai, Maui, and the island of Hawaii (Bates 1990; HINHP Database 2000; Service 1999).

Nothing is known of the preferred habitat of or native plant species associated with *Hibiscus brackenridgei* on the island of Kauai.

Nothing is known of the threats to *Hibiscus brackenridgei* on the island of Kauai.

Ischaemum byrone (Hilo ischaemum)

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

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

Historically, *Ischaemum byrone* was reported from Oahu, Molokai, East Maui, Kauai and the island of Hawaii. Currently, this species is found on Molokai, Hawaii, Maui, and recently rediscovered on the north shore of Kauai. On Kauai, there are two occurrences with at least two individuals at Kaweonui Point and Kauapea Beach on privately owned land (HINHP Database 2000; 59 FR 10305).

The habitat of *Ischaemum byrone* is coastal shrubland, near the ocean among rocks and seepy cliffs at elevations between 0 and 297 m (0 and 975 ft). Associated native plant species include *Bidens* spp., *Chamaesyce celastroides*, *Fimbristylis cymosa*, *Lipochaeta succulenta*, *Lysimachia mauritiana*, or *Scaevola sericea* (HINHP Database 2000; K. Wood, pers. comm., 2001).

Threats to *Ischaemum byrone* include the invasion of nonnative plants, fire, grazing and browsing by feral goats and pigs. Disturbance incurred from these ungulates further promotes the introduction and establishment of nonnative weeds. Some populations are also threatened from residential development (HINHP Database 2000; Service 1996; 59 FR 10305).

Isodendron laurifolium (aupaka)

Isodendron laurifolium, a member of the violet family (Violaceae), is a slender, erect shrub with few branches. The short-lived perennial species is distinguished from others in the genus

by its leathery, oblong-elliptic or narrowly elliptic, lance-shaped leaves (Wagner *et al.* 1999).

Little is known about the life history of *Isodendron laurifolium*. Its flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1999).

Historically, *Isodendron laurifolium* is known from scattered locations on Kauai and Oahu. Currently, on Kauai, this species is found on State-owned land within the Alakai Wilderness Preserve, Kuia NAR, Na Pali-Kona Forest Reserve, and Puu Ka Pele Forest Reserve in the following locations: Paaiki, Poopooiki, Kawaiula Valley, Mahanaloa Valley, Makaha Valley, Haelele Valley, Kipalau Valley, Kawaiiki Valley and Kaluahaulu Ridge. There are a total of 13 occurrences with 142 to 154 individuals (GDSI 2000; HINHP Database 2000; Service 1999).

Isodendron laurifolium is usually found at elevations between 376 and 1,163 m (1,233 and 3,817 ft) in diverse mesic forest dominated by *Metrosideros polymorpha*, *Acacia koa* or *Diospyros* spp. Associated native species include *Alphitonia ponderosa*, *Antidesma* spp., *Claoxylon sandwicense*, *Dodonaea viscosa*, *Dubautia* spp., *Elaeocarpus bifidus*, *Euphorbia haeleleana*, *Hedyotis terminalis*, *Kokia kauaiensis*, *Melicope anisata*, *Melicope barbigera*, *Melicope ovata* (alani), *Melicope peduncularis*, *Myrsine lanaiensis*, *Nestegis sandwicensis*, *Pisonia* spp., *Pittosporum glabrum* (hoawa), *Pleomele aurea*, *Pouteria sandwicensis*, *Psychdrax odorata*, *Streblus pendulinus*, or *Xylosma hawaiiense* (HINHP Database 2000; K. Wood, pers. comm., 2001).

The primary threats to *Isodendron laurifolium* on Kauai are habitat degradation by feral goats, pigs and deer and competition with nonnative plants (HINHP Database 2000; Service 1999; 61 FR 53108).

Isodendron longifolium (aupaka)

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

Little is known about the life history of *Isodendron longifolium*. Its flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1999).

Historically and currently, *Isodendron longifolium* is known from scattered locations on Kauai and Oahu.

On Kauai, this species is reported from Limahuli Valley, Hanakapiai, Pohakea, Waioli Valley, the left branch of Kalalau Valley, Honopu Valley, Kawaiula Valley, and Haupu. There is a total of 15 occurrences on Kauai containing approximately 804 to 854 individual plants on State (Halelea Forest Reserve, Hono o Na Pali NAR, Kokee State Park, Na Pali Coast State Park, and Na Pali-Kona Forest Reserve) and privately owned lands (GDSI 2000; HINHP Database 2000; Lorence and Flynn 1991, 1993; Service 1999; 61 FR 53108).

Isodendron longifolium is found on steep slopes, gulches, or streambanks and some flats in certain undisturbed areas in mesic or wet *Metrosideros polymorpha*-*Acacia koa* forests, usually at elevations between 38 and 1,541 m (125 and 5,057 ft). Associated native plant species include *Antidesma* spp., *Bidens* spp., *Bobea brevipes*, *Cheirodendron* spp., *Cibotium* spp., *Cyanea hardyi*, *Cyrtandra* spp., *Dicranopteris linearis*, *Diospyros* spp., *Eugenia reinwardtiana*, *Hedyotis* spp., *Ilex anomala*, *Melicope* spp., *Nestegis sandwicensis*, *Peperomia* spp., *Perrottetia sandwicensis*, *Pipturus* spp., *Pittosporum* spp., *Pritchardia* spp., *Psychotria* spp., *Psychdrax odorata*, or *Syzygium sandwicensis* (HINHP Database 2000; Service 1999; 61 FR 53108; K. Wood, pers. comm., 2001).

The major threats to *Isodendron longifolium* on Kauai are habitat degradation or destruction by feral goats and pigs, and competition with various nonnative plants (HINHP Database 2000; Lorence and Flynn 1993; Service 1999; 61 FR 53108).

Isodendron pyrifolium (wahine noho kula)

Isodendron pyrifolium, a short-lived perennial of the violet family (Violaceae), is a small, branched shrub. It 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 drops all but the newest leaves. After sufficient rain, the plants produce flowers with seeds ripening one to two months later. No other life history information is currently known for this species (Service 1996).

Isodendron pyrifolium is known historically from Niihau, Oahu, Molokai, Lanai, Maui, and Hawaii. It is currently found only on the island of Hawaii. It was last seen on Niihau in the 1850s (GDSI 2000; HINHP Database 2000; Service 1996; 59 FR 10305; Marie Brueggemann, U.S. Fish and Wildlife Service, pers. comm., 2000).

Information on the physical and biological features that are essential to the conservation of *Isodendron pyrifolium* on the island of Niihau is not known.

Information on the threats of *Isodendron pyrifolium* on the island of Niihau is not known.

Lobelia niihauensis (NCN)

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

Lobelia niihauensis flowers in late summer and early fall. Fruits mature four to six weeks later. Plants are known to live as long as 20 years. Little else is known about the life history of *Lobelia niihauensis*. Its flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1998b).

Historically, *Lobelia niihauensis* was known from Oahu, Niihau, and Kauai. It is now known to be extant only on Kauai and Oahu. On Kauai, 13 occurrences containing 284 to 2,134 individuals are found on State (Hono o Na Pali NAR, Na Pali Coast State Park, Na Pali-Kona Forest Reserve, and Puu Ka Pele Forest Reserve) and privately owned lands in Limahuli Valley, Hoolulu Valley, Hanakoa Valley, Pohakua, the left and right branches of Kalalau Valley, Koaie Canyon, Kipalau Valley, Polihale Spring, Kaaweiki Valley, and Keopaweo (GDSI 2000; HINHP Database 2000; Service 1998b).

Lobelia niihauensis typically grows on exposed, mesic mixed shrubland or coastal dry cliffs at elevations between 11 and 887 m (37 and 2,911 ft). Associated native plant species include *Artemisia australis*, *Bidens sandwicensis*, *Chamaesyce celastroides*, *Charpentiera* spp., *Eragrostis variabilis*, *Hibiscus kokio* ssp. *saint-johnianus*, *Lipochaeta connata* var. *acris*, *Lythrum* spp. (pukamole), *Nototrichium* spp., *Plectranthus parviflorus*, *Schiedea apokremnos*, or *Wilkesia hobdyi* (HINHP Database 2000; Lammers 1999; Service 1998b; K. Wood, pers. comm., 2001).

On Kauai, the major threats to this species are habitat degradation and browsing by feral goats and competition from nonnative plants (56 FR 55770).

Lysimachia filifolia (NCN)

Lysimachia filifolia, a member of the primrose family (Primulaceae), is a

small shrub. This short-lived perennial species is distinguished from other species of the genus by its leaf shape and width, calyx lobe shape, and corolla length (Wagner *et al.* 1999).

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

Historically, *Lysimachia filifolia* was known only from the upper portion of Olokele Valley on Kauai. This species is now also known from Oahu, and the "Blue Hole" area of Waialeale, Kauai. There is currently one occurrence containing a total of 20 to 75 individuals on State-owned land on Kauai within the Lihue-Koloa Forest Reserve (GDSI 2000; HINHP Database 2000; Service 1995).

This species typically grows on mossy banks at the base of cliff faces within the spray zone of waterfalls or along streams in lowland wet forests at elevations between 177 and 1,308 m (581 and 4,290 ft). Associated native plant species include *Antidesma platyphyllum*, *Bidens valida* (kookoolau), *Bobea elatior* (ahakea lau nui), *Chamaesyce remyi* var. *kauaiensis* (akoko), *Cyanea asarifolia*, *Dubautia plantaginea* ssp. *magnifolia* (naenae), *Eragrostis variabilis*, *Machaerina angustifolia*, *Melicope* spp., *Metrosideros polymorpha*, or *Panicum lineale* (HINHP Database 2000; Service 1995; Wagner *et al.* 1999; 59 FR 9304; K. Wood, pers. comm., 2001).

The major threats to *Lysimachia filifolia* on Kauai include competition with nonnative plant species; habitat degradation by feral pigs; and the risk of extinction on Kauai from naturally occurring events (e.g., landslides and hurricanes), due to the small number of individuals in the only known population (HINHP Database 2000; 59 FR 9304).

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

Historically, *Mariscus pennatiformis* was known from Kauai, Oahu, East Maui, the island of Hawaii, and from Laysan Island 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. It was last seen on Kauai in 1927 (GDSI 2000; HINHP Database 2000; K. Wood, in litt. 1999;).

Mariscus pennatiformis is found at elevations between 544 and 1,104 m (1,785 and 3,621 ft) in open sites in *Metrosideros polymorpha*-*Acacia koa* mixed mesic forest. Associated native plant species include *Alsinidendron viscosum*, *Antidesma platyphyllum* var. *hillebrandii*, *Carex alligata* (NCN), *Cyperus laevigatus* (makaloa), *Dianella sandwicensis*, *Diospyros hillebrandii*, *Diospyros sandwicensis*, *Dodonaea viscosa*, *Leptecophylla tameiameia*, *Myrsine linearifolia*, *Nestegis sandwicensis*, *Panicum nephelophilum*, *Poa sandwicensis*, *Psydrax odorata*, *Schiedea stellarioides*, or endemic ferns (HINHP Database 2000; Koyama 1990; K. Wood, pers. comm., 2001).

Threats to *Mariscus pennatiformis* on Kauai include grazing and habitat destruction caused by ungulates; competition from nonnative plant species; and extinction from random naturally occurring events (e.g., landslides or hurricanes) (Service 1999; 59 FR 56333).

Melicope knudsenii (alani)

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

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

Historically and currently, *Melicope knudsenii* is known from Maui and

Kauai. On Kauai, this species is known from 10 occurrences on State-owned land, with a total of 10 individuals, in Poopooiki Valley, Kuia Valley, Mahanaloa Valley, Makaha Ridge, Koaie Canyon, Koaie Falls, and Kawaiiki Valley within Kuia NAR and Na Pali-Kona Forest Reserve (GDSI 2000; HINHP Database 2000; Service 1995; 59 FR 9304; K. Wood, pers. comm., 2001).

Melicope knudsenii grows on forested flats with brown granular soil in lowland dry to montane mesic forests at elevations between 111 and 1,141 m (364 and 3,745 ft) with *Alectryon macrococcus*, *Antidesma platyphylla*, *Bobea brevipes*, *Carex meyenii*, *Cryptocarya mannii*, *Diospyros sandwicensis*, *Diplazium sandwichianum*, *Dodonaea viscosa*, *Euphorbia haeleeleana*, *Gahnia becheyi* (NCN), *Hedyotis* spp., *Hibiscus waimeae*, *Isodendron laurifolium*, *Leptecophylla tameiameia*, *Melicope* spp., *Metrosideros polymorpha*, *Myrsine lanaiensis*, *Nestegis sandwicensis*, *Panicum nephelophilum*, *Peucedanum sandwicense*, *Pisonia sandwicensis*, *Pittosporum kauaiensis*, *Pleomele aurea*, *Pouteria sandwicensis*, *Pritchardia minor*, *Psychotria hobdyi*, *Psydrax odorata*, *Rauvolfia sandwicensis*, *Remya kauaiensis*, *Scaevola procera*, or *Xylosma hawaiiense* (HINHP Database 2000; Service 1995; K. Wood, pers. comm., 2001).

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

Melicope pallida (alani)

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

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

Historically and currently, *Melicope pallida* is known from Oahu and Kauai. On Kauai, the species is currently known from the following locations: Pohakuao, the left branch of Kalalau Valley, Honopu Trail, Awaawapuhi Valley, and Koaie Canyon. There is a total of six occurrences with 181 individuals on State-owned land within the Alakai Wilderness Preserve, Na Pali Coast State Park, and Na Pali-Kona Forest Reserve (GDSI 2000; HINHP Database 2000; D.W. Mathias, U.S. Navy (Navy), *in litt.* 1999; K. Wood, *in litt.* 1999).

Melicope pallida usually grows on steep rock faces in lowland to montane mesic to wet forests or shrubland at elevations between 359 and 1,081 m (1,179 and 3,546 ft). Associated native plant species include *Alyxia oliviformis*, *Artemisia australis*, *Boehmeria grandis*, *Carex meyenii*, *Chamaesyce celastroides* var. *hanapeensis*, *Coprosma kauensis* (koi), *Coprosma waimeae*, *Dodonaea viscosa*, *Dryopteris* spp., *Hedyotis terminalis*, *Lepidium serra*, *Melicope* spp., *Metrosideros polymorpha*, *Nototrichium* spp., *Pipturus albidus* (mamaki), *Pleomele aurea*, *Poa mannii*, *Pritchardia minor*, *Psychotria mariniana*, *Sapindus oahuensis*, *Schiedea membranacea*, *Tetraplasandra waialealae*, or *Xylosma hawaiiense* (HINHP Database 2000; K. Wood, pers. comm., 2001).

The major threats to *Melicope pallida* are habitat destruction by feral goats and pigs; the black twig borer; fire; susceptibility to extinction from naturally occurring events, such as landslides or hurricanes, and/or reduced reproductive vigor due to the small number of existing populations; and competition with nonnative plant species (Hara and Beardsley 1979; HINHP Database 2000; Medeiros *et al.* 1986; Service 1995; 59 FR 9304).

Peucedanum sandwicense (makou)

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

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

limiting factors are unknown (Service 1995).

Historically and currently, *Peucedanum sandwicense* is known from Molokai, Maui, and Kauai. In 1990, it was discovered on Oahu. On Kauai, there are 15 occurrences on State (Haena State Park, Hono o Na Pali and Kuia NARs, Na Pali Coast State Park, and Na Pali-Kona Forest Reserve) and privately owned lands, containing approximately 156 to 256 individuals, in Maunahou Valley, Limahuli Valley, Hoolulu, Hanakoa, Pohakuao, Kanakou, the left branch of Kalalau Valley, Nualolo Valley, Kuia Valley, Mahanaloa Valley, Koaie Canyon, and Haupu (GDSI 2000; HINHP Database 2000; Service 1995; 59 FR 9304; K. Wood, *in litt.* 1999).

This species grows on cliff habitats in mixed shrub coastal dry cliff communities or diverse mesic forest at elevations between 0 and 1,232 m (0 and 4,041 ft). Associated native plant species include *Acacia koa*, *Artemisia australis*, *Bidens* spp., *Brighamia insignis*, *Carex meyenii*, *Chamaesyce celastroides*, *Diospyros* spp., *Dodonaea viscosa*, *Eragrostis variabilis*, *Hibiscus kokio*, *Lobelia niihauensis*, *Metrosideros polymorpha*, *Panicum lineale*, *Psychotria* spp., *Psydrax odorata*, or *Wilkesia* spp. (Constance and Affolter 1999; HINHP Database 2000; 59 FR 9304; K. Wood, pers. comm., 2001).

The major threats to *Peucedanum sandwicense* on Kauai include competition with introduced plants; habitat degradation and browsing by feral goats and deer; and trampling and trail clearing (Hanakapiai population) (HINHP Database 2000; Service 1995; 59 FR 9304).

Phlegmariurus mannii (wawaeiole)

Phlegmariurus mannii, a member of the clubmoss family (Lycopodiaceae) and a short-lived perennial, is a pendent epiphyte with clustered, delicate red stems and forked reproductive spikes. These traits distinguish it from others in the genus in Hawaii (Holub 1991).

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).

Historically, *Phlegmariurus mannii* was known from Kauai, West Maui, and Hawaii island. Currently, this species is extant on Maui and Hawaii island. It was last observed on Kauai in 1900 (HINHP Database 2000).

Nothing is known of the preferred habitat of or native plant species associated with *Phlegmariurus mannii* on the island of Kauai.

Nothing is known of the threats to *Phlegmariurus mannii* on the island of Kauai.

Phlegmariurus nutans (wawaeiole)

Phlegmariurus nutans is an erect or pendulous herbaceous epiphyte in the clubmoss family (Lycopodiaceae). This species can be distinguished from others of the genus in Hawaii by its epiphytic habit, simple or forking fruiting spikes, and larger and stiffer leaves (Wagner and Wagner 1987).

Phlegmariurus nutans has been observed fertile, with spores, in May and December. Little else is known about the life history of *Phlegmariurus nutans*. Its reproductive cycles, dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1998b).

Historically, *Phlegmariurus nutans* was known from the island of Kauai and from scattered locations in the Koolau Mountains of Oahu. It is currently only known from Oahu. It was last observed on Kauai in 1900 (HINHP Database 2000; Service 1998b).

Phlegmariurus nutans grows on tree trunks, usually on open ridges and slopes in *Metrosideros polymorpha*-*Dicranopteris linearis* wet forests and occasionally mesic forests at elevations between 601 and 1,594 m (1,971 and 5,228 ft). The vegetation in those areas typically includes *Antidesma platyphyllum*, *Broussaisia arguta*, *Cheirodendron fauriei*, *Cibotium* spp., *Diplopterygium pinnatum*, *Hedyotis terminalis*, *Hibiscus kokio* ssp. *kokio*, *Melicope waialealae* (alani wai), *Scaevola gaudichaudii*, *Syzygium sandwicensis*, *Perrottetia sandwicensis*, *Psychotria hexandra*, *Psychotria mariniana*, or *Psychotria wawrae* (K. Wood, pers. comm., 2001).

The primary threat to *Phlegmariurus nutans* is extinction due to naturally occurring events and/or reduced reproductive vigor because of the small number of remaining individuals and limited distribution. Additional threats to this species are feral pigs and the nonnative plants *Clidemia hirta* or *Psidium cattleianum* (Service 1998b).

Plantago princeps (laukahi kuahiwi)

Plantago princeps, a member of the plantain family (Plantaginaceae), is a small shrub or robust perennial herb. This short-lived perennial species differs from other native members of the genus in Hawaii by its large branched stems, flowers at nearly right angles to the axis of the flower cluster, and fruits that break open at a point two-thirds from the base. The four varieties, 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).

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

Historically, *Plantago princeps* was found on the islands of Hawaii, Kauai, Maui, Molokai, and Oahu. It no longer occurs on the island of Hawaii. Two varieties of the species, totaling seven occurrences, with 542 to 670 individuals, are extant on the island of Kauai, on both State (Halelea Forest Reserve, Lihue-Koloa Forest Reserve, and Na Pali Coast State Park) and privately owned lands. Historically on Kauai, *Plantago princeps* var. *anomala* was reported from a ridge west of Hanapepe River. Currently, this variety is found in the left branch of Kalalau Valley and Puu Ki. *Plantago princeps* var. *longibracteata* was historically known from Hanalei, the Wahiawa Mountains, and Hanapepe Falls. Currently, five occurrences are known from Waioli Valley, Alakai Swamp, the left branch of Wainiha Valley, and Blue Hole (GDSI 2000; HINHP Database 2000; Service 1999; 59 FR 56333).

Plantago princeps var. *longibracteata* is found in windswept areas near waterfalls in *Metrosideros polymorpha*-*Cheirodendron* montane wet forest with riparian vegetation at elevations between 347 and 1,598 m (1,139 and 5,244 ft). Associated native plant species include *Antidesma platyphyllum* var. *hillebrandii*, *Bidens forbesii*, *Bobea elatior*, *Boehmeria grandis*, *Cyrtandra* spp., *Diplazium sandwichianum*, *Freycinetia arborea*, *Gunnera kauaiensis*, *Hedyotis centranthoides*, *Hedyotis elatior*, *Huperzia* spp., *Isachne pallens* (NCN), *Machaerina angustifolia*, *Perrottetia sandwicensis*, *Pilea peploides* (NCN), *Pipturus* spp., *Sadleria cyatheoides* (amau), or *Tetraplasandra* spp. (K. Wood, pers. comm., 2001).

Plantago princeps var. *anomala* is found in *Metrosideros polymorpha* lowland to montane transitional wet forest on cliffs and ridges, growing on basalt rocky outcrops. Associated native plant species include *Bidens sandwicensis*, *Carex meyenii*, *Carex wahuensis*, *Charpentiera elliptica*, *Hedyotis* spp., *Lipochaeta connata*, *Lysimachia glutinosa*, *Lysimachia kalalauensis*, *Melicope* spp., *Myrsine*

linearifolia, *Poa mannii*, or *Wilkesia gymnoxiphium* (K. Wood, pers. comm., 2001).

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

Platanthera holochila (NCN)

Platanthera holochila, a member of the orchid family (Orchidaceae), is an erect, deciduous herb. The stems arise from underground tubers, the pale green leaves are lance- to egg-shaped, and the greenish-yellow flowers occur in open spikes. This short-lived perennial is the only species of this genus that occurs in the Hawaiian Islands. It is distinguished from other Hawaiian orchids by its underground tubers that lack roots at the nodes or pseudobulbs, and the shape and length of its dorsal sepal (Wagner *et al.* 1999).

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

Historically, *Platanthera holochila* was known from the Alakai Swamp, Kaholuamano area, and the Wahiawa Mountains on Kauai, and scattered locations on Oahu, Molokai, and Maui. Currently, *P. holochila* is extant on Kauai, Molokai, and Maui. On Kauai, there are two occurrences with 24 to 34 individuals reported on State-owned lands (Alakai Wilderness Preserve) at Kilohana and the Alakai Swamp (GDSI 2000; HINHP Database 2000).

Platanthera holochila is found in montane *Metrosideros polymorpha*-*Dicranopteris linearis* wet forest or *M. polymorpha* mixed bog at elevations between 803 and 1,563 m (2,635 and 5,128 ft). Associated native plant species include grammitid ferns, *Carex montis-eeka* (NCN), *Cibotium* spp., *Clermontia fauriei* (oha wai), *Coprosma elliptica* (pilo), *Dichantheium* spp., *Leptecophylla tameiameia*, *Lobelia kauaensis*, *Machaerina angustifolia*, *Myrsine denticulata* (kolea), *Oreobolus furcatus*, *Rhynchospora* spp. (kuolohia), *Vaccinium* spp., or *Viola kauaensis* (Service 1999; 61 FR 53108; K. Wood, pers. comm., 2001).

The primary threats to *Platanthera holochila* on Kauai are habitat degradation and destruction by pigs; competition with nonnative plants; and a risk of extinction on Kauai from

naturally occurring events, such as landslides or hurricanes, and/or reduced reproductive vigor, due to the small number of remaining populations and individuals. Predation by introduced slugs may also be a potential threat to this species (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 (flowers contain both male and female sexual parts). 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 (Service 1999).

Historically, *Schiedea nuttallii* was known from Kauai and Oahu and was reported from Maui. Currently, it is found on Kauai, Oahu, and Molokai. On Kauai, one occurrence with 10 to 50 individuals is found on Haupu Peak on privately owned land. The status of individuals previously found in Limahuli Valley is currently unknown (GDSI 2000; HINHP Database 2000; Service 1999; 1 FR 53108).

Schiedea nuttallii typically grows on cliffs in lowland diverse mesic forest dominated by *Metrosideros polymorpha* at elevations between 37 and 702 m (120 and 2,303 ft). Associated native plant species include *Antidesma platyphyllum* var. *hillebrandii*, *Bidens valida*, *Chamaesyce celastroides*, *Eragrostis variabilis*, *Hedyotis acuminata*, *Hedyotis fluviatilis* (kamapuaa), *Heteropogon contortus*, *Lepidium* spp. (anaunau), *Lobelia niihauensis*, *Perrottetia sandwicensis*, *Pisonia* spp., or *Psychotria* spp. (Service 1999; K. Wood, pers. comm., 2001).

Schiedea nuttallii is threatened on Kauai by habitat degradation and/or destruction by feral pigs, goats, and possibly deer; competition with several nonnative plants; landslides; predation by the black twig borer; and a risk of extinction from naturally occurring

events (e.g., landslides or hurricanes) and/or reduced reproductive vigor, due to the small number of individuals in the only known population. Based on observations that indicate that introduced snails and slugs may consume seeds and seedlings, it is likely that introduced molluscs also represent a major threat to this species (Service 1999; 61 FR 53108).

Sesbania tomentosa (ohai)

Sesbania tomentosa, a member of the pea family (Fabaceae), is typically a sprawling short-lived perennial shrub, but may also be a small tree. Each compound leaf consists of 18 to 38 oblong to elliptic leaflets which are usually sparsely to densely covered with silky hairs. The flowers are salmon colored, tinged with yellow, orange-red, scarlet or, rarely, pure yellow coloration. *Sesbania tomentosa* is the only endemic Hawaiian species in the genus, differing from the naturalized *S. sesban* by the color of the flowers, the longer petals and calyx, and the number of seeds per pod (Geesink *et al.* 1999).

The pollination biology of *Sesbania tomentosa* has been studied by David Hopper, University of Hawaii. 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 this plant's life history are unknown (Service 1999).

Currently, *Sesbania tomentosa* occurs on six of the eight main Hawaiian Islands (Kauai, Oahu, Molokai, Kahoolawe, Maui, and Hawaii) and in the Northwestern Hawaiian Islands (Nihoa and Necker islands). Although once found on Niihau and Lanai, it is no longer extant on those islands. On Kauai, *S. tomentosa* is known from one occurrence, with 11 individuals, on State-owned land at Polihale State Park (GDSI 2000; HINHP Database 2000; 59 FR 56333).

Sesbania tomentosa is found on sandy beaches, dunes, or pond margins at elevations between 0 and 212 m (0 and 694 ft). It commonly occurs in coastal dry shrublands or mixed coastal dry cliffs with the associated native plant species *Chamaesyce celastroides*, *Cuscuta sandwichiana* (kaunaoa), *Dodonaea viscosa*, *Heteropogon contortus*, *Myoporum sandwicense*, *Nama sandwicensis*, *Scaevola sericea*, *Sida fallax*, *Sporobolus virginicus*, *Vitex rotundifolia*, or *Waltheria indica*

(HINHP Database 2000; Service 1999; K. Wood, pers. comm., 2001).

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

Silene lanceolata (NCN)

Silene lanceolata, a member of the pink family (Caryophyllaceae), is an upright, short-lived perennial plant with stems 15 to 51 cm (6 to 20 in) long, which are woody at the base. The flowers are white with deeply-lobed, clawed petals. This species is distinguished from other Hawaiian *Silene* species by its erect stem, terminal inflorescence, and the length of the calyx, clawed petals, and carpophore (ovary structure) (Wagner *et al.* 1999).

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

The historical range of *Silene lanceolata* includes five Hawaiian Islands: Kauai, Oahu, Molokai, Lanai, and Hawaii. *Silene lanceolata* is presently extant on the islands of Molokai, Oahu, and Hawaii. It was last observed on Kauai in the 1850s (GDSI 2000; Service 1996; 57 FR 46325).

Nothing is known of the preferred habitat of or native plant species associated with *Silene lanceolata* on the island of Kauai.

Nothing is known of the threats to *Silene lanceolata* on the island of Kauai.

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*. Its flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (59 FR 56333).

Historically, *Solanum incompletum* was known from Lanai, 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, the species is only known from the island of Hawaii. The reported presence on Kauai may be erroneous (HINHP Database 2000; Christopher Puttock, Bernice P. Bishop Museum, pers. comm., 2001).

Nothing is known of the preferred habitat of or native plant species associated with *Solanum incompletum* on the island of Kauai.

Nothing is known of the threats to *Solanum incompletum* on the island of Kauai.

Solanum sandwicense (aiakeakua, popolo)

Solanum sandwicense, a member of the nightshade family (Solanaceae), is a large sprawling shrub. The younger branches are more densely hairy than older branches and the oval leaves usually have up to 4 lobes along the margins. This short-lived perennial species differs from others of the genus in having dense hairs on young plant parts, a greater height, and lacking prickles (Symon 1999).

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

Historically, *Solanum sandwicense* was known from both Oahu and Kauai. Currently, this species is only known from Kauai. On Kauai, this species was historically reported from locations in the Kokee region bounded by Kalalau Valley, Milolii Ridge, and extending to the Hanapepe River. Currently, *S. sandwicense* is only known from eight occurrences of 14 individual plants on private and State lands (Kokee State Park, Kuia NAR, and Na Pali-Kona Forest Reserve) at Kahuamaa Flats, Awaawapuhi Valley, Kumuwela Ridge, Waialae Valley, and Mokuone Stream (GDSI 2000; HINHP Database 2000; Service 1995; 59 FR 9304; K. Wood, *in litt.* 1999; Joan Yoshioka, The Nature Conservancy of Hawaii (TNCH), pers. comm., 2000).

This species is typically found under forest canopies at elevations between 445 and 1,290 m (1,460 and 4,232 ft) in diverse lowland or montane *Acacia koa* or *A. koa-Metrosideros polymorpha* mesic forests or occasionally in wet forests. Associated native plant species include *Alphitonia ponderosa*, *Athyrium sandwicensis*, *Bidens* spp.,

Carex meyenii, *Coprosma* spp., *Cryptocarya mannii*, *Dianella sandwicensis*, *Dicranopteris linearis*, *Dubautia* spp., *Hedyotis* spp., *Ilex anomala*, *Melicope* spp., *Poa* spp., *Pouteria sandwicensis*, *Psychotria* spp., *Syzygium sandwicensis*, or *Xylosma hawaiiense* (HINHP Database 2000; Service 1995; 59 FR 9304; K. Wood, pers. comm., 2001).

The major threats to populations of *Solanum sandwicense* on Kauai are habitat degradation by feral pigs, and competition with nonnative plant species (*Hedychium gardnerianum* (kahili ginger), *Lonicera japonica* *Passiflora tarminiana*, *Psidium cattleianum*, or *Rubus argutus*); fire; human disturbance and development; and a risk of extinction from naturally occurring events (e.g., landslides or hurricanes) and/or reduced reproductive vigor due to the small number of existing individuals (HINHP Database 2000; Service 1995; 59 FR 9304).

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

Historically, *Spermolepis hawaiiensis* was known from Kauai, Oahu, Lanai, and the island of Hawaii. Currently, it is found on Kauai, Oahu, Molokai, Lanai, West Maui, and Hawaii. On Kauai, this species is known from State-owned land at Koaie Canyon, the rim of Waimea Canyon, and Kapahili Gulch within the Na Pali-Kona Forest Reserve. There are two known occurrences with five individuals total on Kauai (GDSI 2000; HINHP Database 2000; Service 1999; 59 FR 56333).

Spermolepis hawaiiensis is known from *Metrosideros polymorpha* forest and *Dodonaea viscosa* lowland dry shrubland, at elevations between 56 and 725 m (184 and 2,377 ft). Associated native plant species include *Bidens sandwicensis*, *Doryopteris* spp., *Eragrostis variabilis*, *Erythrina sandwicensis*, *Lipochaeta* spp., *Schiedea spargulina*, or *Sida fallax* (HINHP Database 2000; Service 1999; K. Wood, pers. comm., 2001).

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

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

Historically, *Vigna o-wahuensis* was known from Niihau, Oahu, Molokai, Lanai, Kahoolawe, Maui, and the island of Hawaii. Currently, *Vigna o-wahuensis* is known from Molokai, Lanai, Kahoolawe, Maui, and the island of Hawaii. It was last observed on Niihau in 1912 (GDSI 2000; HINHP Database 2000; 59 FR 56333).

Nothing is known of the preferred habitat of or native plant species associated with *Vigna o-wahuensis* on the island of Niihau.

Nothing is known of the threats to *Vigna o-wahuensis* on the island of Niihau.

Zanthoxylum hawaiiense (ae)

Zanthoxylum hawaiiense is a medium-sized tree with pale to dark

gray bark and lemon-scented leaves in the rue family (Rutaceae). A long-lived perennial tree, *Z. hawaiiense* is distinguished from other Hawaiian members of the genus by several characteristics: 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*. Its flowering cycles, pollination vectors, seed dispersal agents, longevity, specific environmental requirements, and limiting factors are unknown (Service 1996).

Historically, *Zanthoxylum hawaiiense* was known from five islands: Kauai, Molokai, Lanai, Maui, and Hawaii. Currently, *Zanthoxylum hawaiiense* is found on Kauai, Molokai, Maui, and Hawaii. On Kauai, this species is only known from three occurrences with three individuals on State-owned land in Kawaiiki and Kipalau Valleys within the Alakai Wilderness Preserve and Na Pali-Kona Forest Reserve (GDSI 2000; HINHP Database 2000).

Zanthoxylum hawaiiense is reported from lowland dry or mesic forests, at elevations between 332 and 1,151 m (1,089 and 3,774 ft). This species is typically found in forests dominated by *Metrosideros polymorpha* or *Diospyros sandwicensis* with associated native plant species including *Alectryon macrococcus*, *Antidesma platyphyllum*, *Charpentiera elliptica*, *Dodonaea viscosa*, *Melicope* spp., *Myrsine lanaiensis*, *Pisonia* spp., *Pleomele aurea*, *Streblus pendulinus*, or *Zanthoxylum dipetalum* (HINHP Database 2000; K. Wood, pers. comm., 2001).

The threats to *Zanthoxylum hawaiiense* on Kauai include competition with the nonnative plant species *Lantana camara* and *Melia azedarach*; fire; human disturbance; and risk of extinction from naturally occurring events, such as landslides or hurricanes, and/or reduced reproductive vigor due to the small number of existing individuals (Service 1996; 59 FR 10305).

A summary of occurrences and landownership for the 95 plant species reported from the islands of Kauai and Niihau is given in Table 2.

TABLE 2.—SUMMARY OF EXISTING OCCURRENCES ON KAUAI AND NIIHAU, AND LANDOWNERSHIP FOR 95 SPECIES REPORTED FROM KAUAI

Species	Number of current occurrences	Landownership		
		Federal	State	Private
<i>Acaena exigua</i>	0	.....	.....	.....

TABLE 2.—SUMMARY OF EXISTING OCCURRENCES ON KAUAI AND NIIHAU, AND LANDOWNERSHIP FOR 95 SPECIES REPORTED FROM KAUAI—Continued

Species	Number of current occurrences	Landownership		
		Federal	State	Private
<i>Achyranthes mutica</i>	0	.....	.....	.....
<i>Adenophorus periens</i>	7	.....	X	X
<i>Alectryon macrococcus</i>	18	.....	X	.....
<i>Alsinidendron lychnoides</i>	4	.....	X	.....
<i>Alsinidendron viscosum</i>	7	.....	X	.....
<i>Bonamia menziesii</i>	9	.....	X	X
<i>Brighamia insignis</i>	4	.....	X	X
<i>Centaurium sebaeoides</i>	3	.....	X	.....
<i>Chamaesyce halemanui</i>	9	.....	X	.....
<i>Ctenitis squamigera</i>	0	.....	.....	.....
<i>Cyanea asarifolia</i>	2	.....	X	.....
<i>Cyanea recta</i>	8	.....	X	X
<i>Cyanea remyi</i>	7	.....	X	X
<i>Cyanea undulata</i>	1	.....	.....	X
<i>Cyperus trachysanthos</i>	1	.....	.....	X
<i>Cyrtandra cyaneoides</i>	5	.....	X	X
<i>Cyrtandra limahuliensis</i>	13	.....	X	X
<i>Delissea rhytidosperma</i>	3	.....	X	X
<i>Delissea rivularis</i>	2	.....	X	.....
<i>Delissea undulata</i>	1	.....	X	.....
<i>Diellia erecta</i>	1	.....	X	.....
<i>Diellia pallida</i>	6	.....	X	.....
<i>Diplazium molokaiense</i>	0	.....	.....	.....
<i>Dubautia latifolia</i>	26	.....	X	.....
<i>Dubautia pauciflora</i>	4	.....	X	X
<i>Euphorbia haeleeleana</i>	23	.....	X	.....
<i>Exocarpos luteolus</i>	9	.....	X	X
<i>Flueggea neowawraea</i>	10	.....	X	X
<i>Gouania meyenii</i>	3	.....	X	.....
<i>Hedyotis cookiana</i>	1	.....	X	.....
<i>Hedyotis st. johnii</i>	11	.....	X	.....
<i>Hesperomannia lydgatei</i>	4	.....	X	X
<i>Hibiscadelphus woodii</i>	2	.....	X	.....
<i>Hibiscus brackenridgei</i>	0	.....	.....	.....
<i>Hibiscus clayi</i>	1	.....	X	.....
<i>Hibiscus waimeae</i> ssp. <i>hannerae</i>	2	.....	X	X
<i>Ischaemum byrone</i>	2	.....	.....	X
<i>Isodendron laurifolium</i>	13	.....	X	.....
<i>Isodendron longifolium</i>	15	.....	X	X
<i>Isodendron pyriformis</i>	0	.....	.....	.....
<i>Kokia kauaiensis</i>	21	.....	X	.....
<i>Labordia lydgatei</i>	6	.....	X	X
<i>Labordia tinifolia</i> var. <i>wahiawaensis</i>	1	.....	.....	X
<i>Lipochaeta fauriei</i>	5	.....	X	.....
<i>Lipochaeta micrantha</i>	5	.....	X	X
<i>Lipochaeta waimeae</i>	1	.....	X	.....
<i>Lobelia niihauensis</i>	13	.....	X	X
<i>Lysimachia filifolia</i>	1	.....	X	.....
<i>Mariscus pennatifolius</i>	0	.....	.....	.....
<i>Melicope haupuensis</i>	4	.....	X	.....
<i>Melicope knudsenii</i>	10	.....	X	.....
<i>Melicope pallida</i>	6	.....	X	.....
<i>Melicope quadrangularis</i>	0	.....	.....	.....
<i>Munroidendron racemosum</i>	17	.....	X	X
<i>Myrsine linearifolia</i>	12	.....	X	X
<i>Nothocestrum peltatum</i>	10	.....	X	.....
<i>Panicum niihauense</i>	1	.....	X	.....
<i>Peucedanum sandwicense</i>	15	.....	X	X
<i>Phlegmariurus mannii</i>	0	.....	.....	.....
<i>Phlegmariurus nutans</i>	0	.....	.....	.....
<i>Phyllostegia knudsenii</i>	3	.....	X	.....
<i>Phyllostegia waimeae</i>	1	.....	X	.....
<i>Phyllostegia wawrana</i>	4	.....	X	X
<i>Plantago princeps</i>	7	.....	X	X
<i>Platanthera holochila</i>	2	.....	X	.....
<i>Poa mannii</i>	6	.....	X	.....
<i>Poa sandwicensis</i>	9	.....	X	.....
<i>Poa siphonoglossa</i>	5	.....	X	.....
<i>Pritchardia aylmer-robinsonii</i>	1	.....	.....	X

TABLE 2.—SUMMARY OF EXISTING OCCURRENCES ON KAUAI AND NIIHAU, AND LANDOWNERSHIP FOR 95 SPECIES REPORTED FROM KAUAI—Continued

Species	Number of current occurrences	Landownership		
		Federal	State	Private
<i>Pritchardia napaliensis</i>	5	.....	X	.....
<i>Pritchardia viscosa</i>	1	.....	X	.....
<i>Pteralyxia kauaiensis</i>	39	.....	X	.....
<i>Remya kauaiensis</i>	17	.....	X	.....
<i>Remya montgomeryi</i>	6	.....	X	.....
<i>Schiedea apokremnos</i>	5	.....	X	.....
<i>Schiedea helleri</i>	3	.....	X	.....
<i>Schiedea kauaiensis</i>	5	.....	X	.....
<i>Schiedea membranacea</i>	10	.....	X	X
<i>Schiedea nuttallii</i>	1	.....	.....	X
<i>Schiedea spergulina</i> var. <i>leiopoda</i>	1	.....	.....	X
<i>Schiedea spergulina</i> var. <i>spergulina</i>	3	.....	X	.....
<i>Schiedea stellarioides</i>	3	.....	X	.....
<i>Sesbania tomentosa</i>	1	.....	X	.....
<i>Silene lanceolata</i>	0	.....	.....	.....
<i>Solanum incompletum</i>	0	.....	.....	.....
<i>Solanum sandwicense</i>	8	.....	X	X
<i>Spermolepis hawaiiensis</i>	2	.....	X	.....
<i>Stenogyne campanulata</i>	3	.....	X	.....
<i>Vigna o-wahuensis</i>	0	.....	.....	.....
<i>Viola helenae</i>	1	.....	.....	X
<i>Viola kauaiensis</i> var. <i>wahiawaensis</i>	2	.....	.....	X
<i>Wilkesia hobdyi</i>	9	X*	X	.....
<i>Xylosma crenatum</i>	3	.....	X	.....
<i>Zanthoxylum hawaiiense</i>	3	.....	X	.....

*Pacific Missile Range Facility at Makaha Ridge.

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, *Adenophorus periens*, *Alectryon macrococcus* (as *A. macrococcus* var. *macrococcus* and *A. mahoe*), *Bonamia menziesii*, *Brighamia insignis* (as *B. citrina* var. *napaliensis* and *B. insignis*), *Chamaesyce halemanui* (as *Euphorbia halemanui*), *Delissea rhytidosperra*, *Dubautia latifolia* (as *D. latifolia* var. *latifolia*), *Exocarpos luteolus*, *Flueggea neowawraea* (as *Drypetes phyllanthoides*), *Hedyotis st.-johnii*, *Hesperomannia lydgatei*, *Hibiscus clayi* (as *H. clayi* and *H. newhousei*), *H. waimeae* ssp. *hannerae* (as *H. waimeae*), *Kokia kauaiensis*, *Lipochaeta fauriei*, *L. micrantha* (as *L. exigua*), *Lobelia niihauensis*, *Melicope haupuensis* (as *Pelea haupuensis*), *M. knudsenii* (as *P. multiflora*), *M. pallida* (as *P. leveillei* and *P. pallida*), *Melicope quadrangularis* (*Pelea quadrangularis*), *Myrsine linearifolia* (as *M. linearifolia* var. *linearifolia*), *Nothocestrum*

peltatum, *Peucedanum sandwicense* (as *P. kauaiense*), *Phyllostegia knudsenii*, *Plantago princeps* (as *P. princeps* var. *elata*, *P. var. laxifolia*, and *P. var. princeps*), *Poa sandwicensis*, *Pritchardia aylmer-robinsonii*, *Sesbania tomentosa* (as *S. hobdyi* and *S. tomentosa* var. *tomentosa*), *Solanum sandwicense* (as *S. hillebrandii* and *S. kauaiense*), *Viola helenae*, *V. kauaiensis* var. *wahiawaensis*, *Wilkesia hobdyi*, *Xylosma crenatum* (as *Antidesma crenatum*), and *Zanthoxylum hawaiiense* (as *Z. hawaiiense* var. *citidiora*), were considered to be endangered; *Delissea rivularis*, *Diellia pallida* (as *Diellia laciniata*), *Labordia lydgatei*, *Lipochaeta micrantha*, *L. waimeae*, *Lysimachia filifolia*, *Schiedea membranacea*, and *Zanthoxylum hawaiiense* (as *Z. hawaiiense* var. *hawaiiense* and *Z. hawaiiense* var. *velutinosum*) were considered to be threatened; and *Delissea undulata* (as *D. undulata* var. *argutidentata* and *D. undulata* var. *undulata*), *Gouania meyenii*, *Hedyotis cookiana*, *Melicope knudsenii* (as *Pelea knudsenii* and *P. tomentosa*), *Munroidendron racemosum* (as *M. racemosum* var. *macdanielsii*), *Plantago princeps* (as *P. princeps* var. *acaulis*, *P. princeps* var. *denticulata*, and *P. princeps* var. *queleniana*), and *Remya kauaiensis* were considered to be extinct. On July 1, 1975, 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 for *Diellia pallida*. 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 2 years old be withdrawn. A 1-year grace period was given to proposals already over 2 years old. On December 10, 1979, we published a notice in the **Federal Register** (44 FR 70796) withdrawing the portion of the June 16, 1976, proposal that had not been made final, along with four other proposals that had expired. We published updated Notices of

Review for plants on December 15, 1980 (45 FR 82479), September 27, 1985 (50 FR 39525), February 21, 1990 (55 FR 6183), and September 30, 1993 (58 FR

51144). We listed the 95 species as endangered or threatened between 1991 and 1996. A summary of the listing actions can be found in Table 3(a). A

summary of the critical habitat actions can be found in Table 3(b).

TABLE 3(a).—SUMMARY OF LISTING ACTIONS FOR 95 PLANT SPECIES FROM KAUAI AND NIIHAU

Species	Federal status	Proposed listing rule		Final listing rule	
		Date	Federal Register	Date	Federal Register
<i>Acaena exigua</i>	E	5/24/1991	56 FR 23842	5/15/1992	57 FR 20772
<i>Achyranthes mutica</i>	E	10/2/1995	60 FR 51417	10/10/1996	61 FR 53108
<i>Adenophorus periens</i>	E	9/14/1993	58 FR 48012	11/10/1994	59 FR 56333
<i>Alectryon macrococcus</i>	E	5/24/1991	56 FR 23842	5/15/1992	57 FR 20772
<i>Alsinidendron lychnoides</i>	E	9/25/1995	60 FR 49359	10/10/1996	61 FR 53070
<i>Alsinidendron viscosum</i>	E	9/25/1995	60 FR 49359	10/10/1996	61 FR 53070
<i>Bonamia menziesii</i>	E	9/14/1993	58 FR 48012	11/10/1994	59 FR 56333
<i>Brighamia insignis</i>	E	10/30/1991	56 FR 55862	2/25/1994	59 FR 9304
<i>Centaurium sebaeoides</i>	E	9/28/1990	55 FR 39664	10/29/1991	56 FR 55770
<i>Chamaesyce halemanui</i>	E	9/21/1990	55 FR 39301	5/13/1992	57 FR 20580
<i>Ctenitis squamigera</i>	E	6/24/1993	58 FR 34231	9/9/1994	59 FR 49025
<i>Cyanea asarifolia</i>	E	10/30/1991	56 FR 55862	2/25/1994	59 FR 09304
<i>Cyanea recta</i>	T	9/25/1995	60 FR 49359	10/10/1996	61 FR 53070
<i>Cyanea remyi</i>	E	9/25/1995	60 FR 49359	10/10/1996	61 FR 53070
<i>Cyanea undulata</i>	E	9/17/1990	55 FR 38242	9/20/1991	56 FR 47695
<i>Cyperus trachysanthos</i>	E	10/2/1995	60 FR 51417	10/10/1996	61 FR 53108
<i>Cyrtandra cyaneoides</i>	E	9/25/1995	60 FR 49359	10/10/1996	61 FR 53070
<i>Cyrtandra limahuliensis</i>	T	10/30/1991	56 FR 55862	2/25/1994	59 FR 09304
<i>Delissea rhytidosperra</i>	E	10/30/1991	56 FR 55862	2/25/1994	59 FR 09304
<i>Delissea rivularis</i>	E	9/25/1995	60 FR 49359	10/10/1996	61 FR 53070
<i>Delissea undulata</i>	E	6/27/1994	59 FR 32946	10/10/1996	61 FR 53124
<i>Diellia erecta</i>	E	9/14/1993	58 FR 48012	11/10/1994	59 FR 56333
<i>Diellia pallida</i>	E	10/30/1991	56 FR 55862	2/25/1994	59 FR 9304
<i>Diplazium molokaiense</i>	E	6/24/1993	58 FR 34231	9/9/1994	59 FR 49025
<i>Dubautia latifolia</i>	E	9/21/1990	55 FR 39301	5/13/1992	57 FR 20580
<i>Dubautia pauciflora</i>	E	9/17/1990	55 FR 38242	9/20/1991	56 FR 47695
<i>Euphorbia haelealeana</i>	E	10/2/1995	60 FR 51417	10/10/1996	61 FR 53108
<i>Exocarpos luteolus</i>	E	10/30/1991	56 FR 55862	2/25/1994	59 FR 9304
<i>Flueggea neowawraea</i>	E	9/14/1993	58 FR 48012	11/10/1994	59 FR 56333
<i>Gouania meyenii</i>	E	9/28/1990	55 FR 39664	10/29/1991	56 FR 55770
<i>Hedyotis cookiana</i>	E	10/30/1991	56 FR 55862	2/25/1994	59 FR 09304
<i>Hedyotis st. johnii</i>	E	8/3/1990	55 FR 31612	9/30/1991	56 FR 49639
<i>Hesperomannia lydgatei</i>	E	9/17/1990	55 FR 38242	9/20/1991	56 FR 47695
<i>Hibiscadelphus woodii</i>	E	9/25/1995	60 FR 49359	10/10/1996	61 FR 53070
<i>Hibiscus brackenridgei</i>	E	9/14/1993	58 FR 48012	11/10/1994	59 FR 56333
<i>Hibiscus clayi</i>	E	10/30/1991	56 FR 55862	2/25/1994	59 FR 9304
<i>Hibiscus waimeae</i> ssp.	E	9/25/1995	60 FR 49359	10/10/1996	61 FR 53070
<i>Ischaemum byrone</i>	E	12/17/1992	57 FR 59951	3/4/1994	59 FR 10305
<i>Isodendron laurifolium</i>	E	10/2/1995	60 FR 51417	10/10/1996	61 FR 53108
<i>Isodendron longifolium</i>	T	10/2/1995	60 FR 51417	10/10/1996	61 FR 53108
<i>Isodendron pyrifolium</i>	E	12/17/1992	57 FR 59941	3/4/1994	59 FR 10305
<i>Kokia kauaiensis</i>	E	9/25/1995	60 FR 49359	10/10/1996	61 FR 53070
<i>Labordia lydgatei</i>	E	9/17/1990	55 FR 38242	9/20/1991	56 FR 47695
<i>Labordia tinifolia</i> var.	E	9/25/1995	60 FR 49359	10/10/1996	61 FR 53070
<i>Lipochaeta fauriei</i>	E	10/30/1991	56 FR 55862	2/25/1994	59 FR 9304
<i>Lipochaeta micrantha</i>	E	10/30/1991	56 FR 55862	2/25/1994	59 FR 09304
<i>Lipochaeta waimeae</i>	E	10/30/1991	56 FR 55862	2/25/1994	59 FR 09304
<i>Lobelia niihauensis</i>	E	9/28/1990	55 FR 39664	10/29/1991	56 FR 55770
<i>Lysimachia filifolia</i>	E	10/30/1991	56 FR 55862	2/25/1994	59 FR 09304
<i>Mariscus pennatifolius</i>	E	9/14/1993	58 FR 48012	11/10/1994	59 FR 56333
<i>Melicope haupuensis</i>	E	10/30/1991	56 FR 55862	2/25/1994	59 FR 9304
<i>Melicope knudsenii</i>	E	10/30/1991	56 FR 55862	2/25/1994	59 FR 9304
<i>Melicope pallida</i>	E	10/30/1991	56 FR 55862	2/25/1994	59 FR 9304
<i>Melicope quadrangularis</i>	E	10/30/1991	56 FR 55862	2/25/1994	59 FR 9304
<i>Munroidendron racemosum</i>	E	10/30/1991	56 FR 55862	2/25/1994	59 FR 9304
<i>Myrsine linearifolia</i>	T	9/25/1995	60 FR 49359	10/10/1996	61 FR 53070
<i>Nothocestrum peltatum</i>	E	10/30/1991	56 FR 55862	2/25/1994	59 FR 9304
<i>Panicum niihauense</i>	E	10/2/1995	60 FR 51417	10/10/1996	61 FR 53108
<i>Peucedanum sandwicense</i>	T	10/30/1991	56 FR 55862	2/25/1994	59 FR 09304
<i>Phlegmariurus mannii</i>	E	5/24/1991	56 FR 23842	5/15/1992	57 FR 20772
<i>Phlegmariurus nutans</i>	E	9/28/1990	55 FR 39664	10/29/1991	56 FR 55770
<i>Phyllostegia knudsenii</i>	E	9/25/1995	60 FR 49359	10/10/1996	61 FR 53070
<i>Phyllostegia waimeae</i>	E	10/30/1991	56 FR 55862	2/25/1994	59 FR 09304
<i>Phyllostegia wawrana</i>	E	9/25/1995	60 FR 49359	10/10/1996	61 FR 53070

TABLE 3(a).—SUMMARY OF LISTING ACTIONS FOR 95 PLANT SPECIES FROM KAUAI AND NIIHAU—Continued

Species	Federal status	Proposed listing rule		Final listing rule	
		Date	Federal Register	Date	Federal Register
<i>Plantago princeps</i>	E	9/14/1993	58 FR 48012	11/10/1994	59 FR 56333
<i>Platanthera holochila</i>	E	10/2/1995	60 FR 51417	10/10/1996	61 FR 53108
<i>Poa mannii</i>	E	4/7/1993	58 FR 18073	11/10/1994	59 FR 56330
<i>Poa sandvicensis</i>	E	9/21/1990	55 FR 39301	5/13/1992	57 FR 20580
<i>Poa siphonoglossa</i>	E	9/21/1990	55 FR 39301	5/13/1992	57 FR 20580
<i>Pritchardia aylmer-robinsonii</i>	E	12/17/1992	57 FR 59970	8/7/1996	61 FR 41020
<i>Pritchardia napaliensis</i>	E	9/25/1995	60 FR 49359	10/10/1996	61 FR 53070
<i>Pritchardia viscosa</i>	E	9/25/1995	60 FR 49359	10/10/1996	61 FR 53070
<i>Pteralyxia kauaiensis</i>	E	10/30/1991	56 FR 55862	2/25/1994	59 FR 9304
<i>Remya kauaiensis</i>	E	10/2/1989	54 FR 40447	1/14/1991	56 FR 1450
<i>Remya montgomeryi</i>	E	10/2/1989	54 FR 40447	1/14/1991	56 FR 1450
<i>Schiedea apokremnos</i>	E	8/3/1990	55 FR 31612	9/30/1991	56 FR 49639
<i>Schiedea helleri</i>	E	9/25/1995	60 FR 49359	10/10/1996	61 FR 53070
<i>Schiedea kauaiensis</i>	E	10/2/1995	60 FR 51417	10/10/1996	61 FR 53108
<i>Schiedea membranacea</i>	E	9/25/1995	60 FR 49359	10/10/1996	61 FR 53070
<i>Schiedea nuttallii</i>	E	10/2/1995	60 FR 51417	10/10/1996	61 FR 53108
<i>Schiedea spergulina</i> var. <i>leiopoda</i>	E	10/30/1991	56 FR 55862	2/25/1994	59 FR 9304
<i>Schiedea spergulina</i> var. <i>spergulina</i>	T	10/30/1991	56 FR 55862	2/25/1994	59 FR 9304
<i>Schiedea stellarioides</i>	E	9/25/1995	60 FR 49359	10/10/1996	61 FR 53070
<i>Sesbania tomentosa</i>	E	9/14/1993	58 FR 48012	11/10/1994	59 FR 56333
<i>Silene lanceolata</i>	E	9/20/1991	56 FR 47718	10/8/1992	57 FR 46325
<i>Solanum incompletum</i>	E	9/14/1993	58 FR 48012	11/10/1994	59 FR 56333
<i>Solanum sandwicense</i>	E	10/30/1991	56 FR 55862	2/25/1994	59 FR 09304
<i>Spermolepis hawaiiensis</i>	E	9/14/1993	58 FR 48012	11/10/1994	59 FR 56333
<i>Stenogyne campanulata</i>	E	9/21/1990	55 FR 39301	5/13/1992	57 FR 20580
<i>Vigna o-wahuensis</i>	E	9/14/1993	58 FR 48012	11/10/1994	59 FR 56333
<i>Viola helenae</i>	E	9/17/1990	55 FR 38242	9/20/1991	56 FR 47695
<i>Viola kauaiensis</i> var.	E	9/25/1995	60 FR 49359	10/10/1996	61 FR 53070
<i>Wilkesia hobdyi</i>	E	10/2/1989	54 FR 40444	6/22/1992	57 FR 27859
<i>Xylosma crenatum</i>	E	9/21/1990	55 FR 39301	5/13/1992	57 FR 20580
<i>Zanthoxylum hawaiiense</i>	E	12/17/1992	57 FR 59951	3/4/1994	59 FR 10305

Key: E = Endangered T = Threatened

TABLE 3(b).—SUMMARY OF CRITICAL HABITAT ACTIONS FOR 95 PLANT SPECIES FROM KAUAI AND NIIHAU

Species	Proposed critical habitat designation or nondesignation		Final critical habitat	
	Date(s)	Federal Register	Date(s)	Federal Register
<i>Acaena exigua</i>	12/18/2000	65 FR 79192	NA	NA
<i>Achyranthes mutica</i>	5/28/2002	67 FR 36968	NA	NA
<i>Adenophorus periers</i>	11/7/2000	65 FR 66808	NA	NA
	12/29/2000	65 FR 83157		
	1/28/2002	67 FR 3940		
	3/4/2002	67 FR 9806		
	4/5/2002	67 FR 16492		
	5/28/2002	67 FR 36968		
	5/28/2002	67 FR 37108		
<i>Alectryon macrococcus</i>	11/7/2000	65 FR 66808	NA	NA
	12/18/2000	65 FR 79192		
	12/29/2000	65 FR 83157		
	1/28/2002	67 FR 3940		
	4/3/2002	67 FR 15856		
	4/5/2002	67 FR 16492		
	5/28/2002	67 FR 37108		
<i>Alsinidendron lychnoides</i>	11/7/2000	65 FR 66808	NA	NA
<i>Alsinidendron viscosum</i>	11/7/2000	65 FR 66808	NA	NA
<i>Bonamia menziesii</i>	11/7/2000	65 FR 66808	NA	NA
	12/18/2000	65 FR 79192		
	12/27/2000	65 FR 82086		
	1/28/2002	67 FR 3940		
	3/4/2002	67 FR 36968		
	4/3/2002	67 FR 15856		
	5/28/2002	67 FR 9806		
	5/28/2002	67 FR 37108		
<i>Brighamia insignis</i>	11/7/2000	65 FR 66808	NA	NA
<i>Centaurium sebaeoides</i>	11/7/2000	65 FR 66808	NA	NA

TABLE 3(b).—SUMMARY OF CRITICAL HABITAT ACTIONS FOR 95 PLANT SPECIES FROM KAUAI AND NIIHAU—Continued

Species	Proposed critical habitat designation or nondesignation		Final critical habitat	
	Date(s)	Federal Register	Date(s)	Federal Register
	12/18/2000	65 FR 79192		
	12/27/2000	65 FR 82086		
	12/29/2000	65 FR 83157		
	1/28/2002	67 FR 3940		
	3/4/2002	67 FR 9806		
	4/3/2002	67 FR 15856		
	4/5/2002	67 FR 16492		
	5/28/2002	67 FR 37108		
<i>Chamaesyce halemanui</i>	11/7/2000	65 FR 66808	NA	NA
<i>Ctenitis squamigera</i>	12/18/2000	65 FR 79192	NA	NA
	12/27/2000	65 FR 79192		
	12/29/2000	65 FR 83157		
	1/28/2002	67 FR 3940		
	3/4/2002	67 FR 9806		
	4/3/2002	67 FR 15856		
	4/5/2002	67 FR 16492		
	5/28/2002	67 FR 36968		
<i>Cyanea asarifolia</i>	11/07/2000	65 FR 66808	NA	NA
<i>Cyanea recta</i>	11/07/2000	65 FR 66808	NA	NA
<i>Cyanea remyi</i>	11/7/2000	65 FR 66808	NA	NA
<i>Cyanea undulata</i>	11/7/2000	65 FR 66808	NA	NA
<i>Cyperus trachysanthos</i>	11/7/2000	65 FR 66808	NA	NA
	1/28/2002	67 FR 3940		
	3/4/2002	67 FR 9806		
	5/28/2002	67 FR 37108		
<i>Cyrtandra cyaneoides</i>	11/7/2000	65 FR 66808	NA	NA
<i>Cyrtandra limahuliensis</i>	11/7/2000	65 FR 66808	NA	NA
<i>Delissea rhytidosperra</i>	11/7/2000	65 FR 66808	NA	NA
<i>Delissea rivularis</i>	11/7/2000	65 FR 66808	NA	NA
<i>Delissea undulata</i>	11/7/2000	65 FR 66808	NA	NA
<i>Diellia erecta</i>	12/18/2000	65 FR 79192	NA	NA
	12/29/2000	65 FR 83158		
	1/28/2002	67 FR 3940		
	3/4/2002	67 FR 9806		
	4/3/2002	67 FR 15856		
	4/5/2002	67 FR 16492		
	5/28/2002	67 FR 36968		
	5/28/2002	67 FR 37108		
<i>Diellia pallida</i>	11/7/2000	65 FR 66808	NA	NA
<i>Diplazium molokaiense</i>	12/18/2000	65 FR 79192	NA	NA
	01/28/2002	67 FR 3940		
	4/3/2002	67 FR 15856		
	3/4/2002	67 FR 9806		
	4/5/2002	67 FR 16492		
	5/28/2002	67 FR 37108		
<i>Dubautia latifolia</i>	11/07/2000	65 FR 66808	NA	NA
<i>Dubautia pauciflora</i>	11/07/2000	65 FR 66808	NA	NA
<i>Euphorbia haeleeleana</i>	11/07/2000	65 FR 66808	NA	NA
	01/28/2002	67 FR 3940		
	05/28/2002			
<i>Exocarpos luteolus</i>	11/07/2000	65 FR 66808	NA	NA
<i>Flueggea neowawraea</i>	11/07/2000	65 FR 66808	NA	NA
	12/18/2000	65 FR 79192		
	1/28/2002	67 FR 3940		
	4/3/2002	67 FR 15856		
	04/5/2002	67 FR 16492		
	5/28/2002	67 FR 36968		
	5/28/2002	67 FR 37108		
<i>Gouania meyenii</i>	11/07/2000	65 FR 66808	NA	NA
	1/28/2002	67 FR 3940		
<i>Hedyotis cookiana</i>	11/07/2000	65 FR 66808	NA	NA
<i>Hedyotis st. johnii</i>	11/7/2000	65 FR 66808	NA	NA
<i>Hesperomannia lydgatei</i>	11/07/2000	65 FR 66808	NA	NA
<i>Hibiscadelphus woodii</i>	11/7/2000	65 FR 66808	NA	NA
<i>Hibiscus brackenridgei</i>	12/18/2000	65 FR 79192	NA	NA
	12/27/2000	65 FR 82086		
	3/4/2002	67 FR 9806		
	4/3/2002	67 FR 15856		

TABLE 3(b).—SUMMARY OF CRITICAL HABITAT ACTIONS FOR 95 PLANT SPECIES FROM KAUAI AND NIIHAU—Continued

Species	Proposed critical habitat designation or nondesignation		Final critical habitat	
	Date(s)	Federal Register	Date(s)	Federal Register
	4/5/2002	67 FR 16492		
	5/28/2002	67 FR 36968		
	5/28/2002	67 FR 37108		
<i>Hibiscus clayi</i>	11/07/2000	65 FR 66808	NA	NA
<i>Hibiscus waimeae</i> ssp. <i>hannerae</i>	11/07/2000	65 FR 66808	NA	NA
<i>Ischaemum byrone</i>	12/18/2000	65 FR 79192	NA	NA
	12/29/2000	65 FR 83158		
	1/28/2002	67 FR 3940		
	4/3/2002	67 FR 15856		
	4/5/2002	67 FR 16492		
	5/28/2002	67 FR 36968		
<i>Isodendron laurifolium</i>	11/07/2000	65 FR 66808	NA	NA
	1/28/2002	67 FR 3940		
	5/28/2002	67 FR 37108		
<i>Isodendron longifolium</i>	11/07/2000	65 FR 66808	NA	NA
	1/28/2002	67 FR 3940		
	5/28/2002	67 FR 37108		
<i>Isodendron pyrifolium</i>	3/4/2002	67 FR 9806	NA	NA
	4/3/2002	67 FR 15856		
	4/5/2002	67 FR 16492		
	5/28/2002	67 FR 36968		
	5/28/2002	67 FR 37108		
<i>Kokia kauaiensis</i>	11/07/2000	65 FR 66808	NA	NA
<i>Labordia lydgatei</i>	11/07/2000	65 FR 66808	NA	NA
<i>Labordia tinifolia</i> var. <i>wahiawaensis</i>	11/07/2000	65 FR 66808	NA	NA
<i>Lipochaeta fauriei</i>	11/07/2000	65 FR 66808	NA	NA
<i>Lipochaeta micrantha</i>	11/07/2000	65 FR 66808	NA	NA
<i>Lipochaeta waimeae</i>	11/07/2000	65 FR 66808	NA	NA
<i>Lobelia niihauensis</i>	11/07/2000	65 FR 66808	NA	NA
	1/28/2002	67 FR 3940		
	5/28/2002	67 FR 37108		
<i>Lysimachia filifolia</i>	11/07/2000	65 FR 66808	NA	NA
	1/28/2002	67 FR 3940		
	5/28/2002	67 FR 37108		
<i>Mariscus pennatifolius</i>	12/18/2000	65 FR 79192	NA	NA
	1/28/2002	67 FR 3940		
	4/3/2002	67 FR 15856		
	5/14/2002	67 FR 34522		
	5/28/2002	67 FR 37108		
<i>Melicope haupuensis</i>	11/07/2000	65 FR 66808	NA	NA
<i>Melicope knudsenii</i>	11/07/2000	65 FR 66808	NA	NA
	12/18/2000	65 FR 79192		
	1/28/2002	67 FR 3940		
	4/3/2002	67 FR 15856		
<i>Melicope pallida</i>	11/07/2000	65 FR 66808	NA	NA
	1/28/2002	67 FR 3940		
	5/28/2002	67 FR 37108		
<i>Melicope quadrangularis</i>	11/07/2000	65 FR 66808	NA	NA
<i>Munroidendron racemosum</i>	11/07/2000	65 FR 66808	NA	NA
<i>Myrsine linearifolia</i>	11/07/2000	65 FR 66808	NA	NA
<i>Nothocestrum peltatum</i>	11/7/2000	65 FR 66808	NA	NA
<i>Panicum niihauense</i>	11/7/2000	65 FR 66808	NA	NA
<i>Peucedanum sandwicense</i>	11/7/2000	65 FR 66808	NA	NA
	12/18/2000	65 FR 79192		
	12/29/2000	65 FR 83157		
	1/28/2002	67 FR 3940		
	4/3/2002	67 FR 15856		
	4/5/2002	67 FR 16492		
	5/28/2002	67 FR 37108		
<i>Phlegmariurus mannii</i>	12/18/2000	65 FR 79192	NA	NA
	4/3/2002	67 FR 15856		
<i>Phlegmariurus nutans</i>	1/28/2002	67 FR 3940	NA	NA
	5/28/2002	67 FR 37108		
<i>Phyllostegia knudsenii</i>	11/7/2000	65 FR 66808	NA	NA
<i>Phyllostegia waimeae</i>	11/7/2000	65 FR 66808	NA	NA
<i>Phyllostegia wawrana</i>	11/7/2000	65 FR 66808	NA	NA
<i>Plantago princeps</i>	11/7/2000	65 FR 66808	NA	NA
	12/18/2000	65 FR 79192		

TABLE 3(b).—SUMMARY OF CRITICAL HABITAT ACTIONS FOR 95 PLANT SPECIES FROM KAUAI AND NIIHAU—Continued

Species	Proposed critical habitat designation or nondesignation		Final critical habitat	
	Date(s)	Federal Register	Date(s)	Federal Register
<i>Platanthera holochila</i>	12/29/2000 1/28/2002 4/3/2002 4/5/2002 11/07/2000 12/18/2000 12/29/2000 1/28/2002 4/3/2002 4/5/2002 5/28/2002	65 FR 83158 67 FR 3940 67 FR 15856 67 FR 16492 65 FR 66808 65 FR 79192 65 FR 83158 67 FR 3940 67 FR 15856 67 FR 16492 67 FR 37108	NA	NA
<i>Poa mannii</i>	11/7/2000	65 FR 66808	NA	NA
<i>Poa sandvicensis</i>	11/7/2000	65 FR 66808	NA	NA
<i>Poa siphonoglossa</i>	11/7/2000	65 FR 66808	NA	NA
<i>Pritchardia aylmer-robinsonii</i>	11/7/2000	65 FR 66808	NA	NA
<i>Pritchardia napaliensis</i>	11/7/2000	65 FR 66808	NA	NA
<i>Pritchardia viscosa</i>	11/7/2000	65 FR 66808	NA	NA
<i>Pteralyxia kauaiensis</i>	11/7/2000	65 FR 66808	NA	NA
<i>Remya kauaiensis</i>	11/7/2000	65 FR 66808	NA	NA
<i>Remya montgomeryi</i>	11/7/2000	65 FR 66808	NA	NA
<i>Schiedea apokremnos</i>	11/7/2000	65 FR 66808	NA	NA
<i>Schiedea helleri</i>	11/7/2000	65 FR 66808	NA	NA
<i>Schiedea kauaiensis</i>	11/7/2000	65 FR 66808	NA	NA
<i>Schiedea membranacea</i>	11/7/2000	65 FR 66808	NA	NA
<i>Schiedea nuttallii</i>	11/7/2000 12/29/2000 1/28/2002 4/5/2002 5/28/2002	65 FR 66808 65 FR 83158 67 FR 3940 67 FR 16492 67 FR 37108	NA	NA
<i>Schiedea spergulina</i> var. <i>leiopoda</i>	11/7/2000	65 FR 66808	NA	NA
<i>Schiedea spergulina</i> var. <i>spergulina</i>	11/7/2000	65 FR 66808	NA	NA
<i>Schiedea stellarioides</i>	11/7/2000	65 FR 66808	NA	NA
<i>Sesbania tomentosa</i>	11/7/2000 12/18/2000 12/29/2000 1/28/2002 3/4/2002 4/3/2002 4/5/2002 5/14/2002 5/28/2002 5/28/2002	65 FR 66808 65 FR 79192 65 FR 83158 67 FR 3940 67 FR 9806 67 FR 15856 67 FR 16492 67 FR 34522 67 FR 36968 67 FR 37108	NA	NA
<i>Silene lanceolata</i>	12/29/2000 4/5/2002 5/28/2002 5/28/2002	65 FR 83158 67 FR 16492 67 FR 36968 67 FR 37108	NA	NA
<i>Solanum incompletum</i>	4/4/2002 5/28/2002	67 FR 9806 67 FR 36968	NA	NA
<i>Solanum sandwicense</i>	11/7/2000 1/28/2002 5/28/2002	65 FR 66808 67 FR 3940 67 FR 37108	NA	NA
<i>Spermolepis hawaiiensis</i>	11/7/2000 12/29/2000 1/28/2002 3/4/2002 4/3/2002 4/5/2002 5/28/2002 5/28/2002	65 FR 66808 65 FR 83158 67 FR 3940 67 FR 9806 67 FR 15856 67 FR 16492 67 FR 36968 67 FR 37108	NA	NA
<i>Stenogyne campanulata</i>	11/7/2000	65 FR 66808	NA	NA
<i>Vigna o-wahuensis</i>	12/18/2000 12/27/2000 12/29/2000 3/4/2002 4/3/2002 4/5/2002 5/28/2002 5/28/2002	65 FR 79192 65 FR 82086 65 FR 83158 67 FR 9806 67 FR 15856 67 FR 16492 67 FR 36968 67 FR 37108	NA	NA

TABLE 3(b).—SUMMARY OF CRITICAL HABITAT ACTIONS FOR 95 PLANT SPECIES FROM KAUAI AND NIIHAU—Continued

Species	Proposed critical habitat designation or nondesignation		Final critical habitat	
	Date(s)	Federal Register	Date(s)	Federal Register
<i>Viola helenae</i>	11/7/2000	65 FR 66808	NA	NA
<i>Viola kauaiensis</i> var. <i>wahiawaensis</i>	11/7/2000	65 FR 66808	NA	NA
<i>Wilkesia hobbdi</i>	11/7/2000	65 FR 66808	NA	NA
<i>Xylosma crenatum</i>	11/7/2000	65 FR 66808	NA	NA
<i>Zanthoxylum hawaiiense</i>	11/7/2000	65 FR 66808	NA	NA
	12/18/2000	65 FR 79192		
	12/29/2000	65 FR 83158		
	1/28/2002	67 FR 3940		
	4/3/2002	67 FR 15856		
	4/5/2002	67 FR 16492		
	5/28/2002	67 FR 36968		

At the time each of the 95 plants was listed, we determined that designation of critical habitat was not prudent 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 prudence determinations for 245 listed plant species in Hawaii, including the 95 species reported from Kauai. 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).

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)).

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 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 October 5, 1999, we contacted landowners on the islands of Kauai and Niihau, notifying them of our requirement to designate critical habitat for 95 plant species. We 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 three open houses on the island of Kauai, at the Waimea Community Center, the Kauai War Memorial Convention Hall in Lihue, and the Kilauea Neighborhood Center, on October 19, 20, and 21, 1999, respectively, to meet one-on-one with local landowners and other interested members of the public. In addition, we met with Kauai County DOFAW staff

and Kauai State Parks staff to discuss their management activities on Kauai.

On November 7, 2000, we published the first of the court-ordered proposed critical habitat designations or nondesignations for 76 Kauai and Niihau plants (65 FR 66808). The proposed critical habitat designations for Maui and Kahoolawe plants were published on December 18, 2000 (65 FR 79192), for Lanai plants on December 27, 2000 (65 FR 82086), and for Molokai plants on December 29, 2000 (65 FR 83158). All of these proposed rules had been sent to the **Federal Register** by or on November 30, 2000, as required by the court's order. In those proposals, we proposed that critical habitat was prudent for 85 species (*Adenophorus periens*, *Alectryon macrococcus*, *Alsinidendron lychnoides*, *Alsinidendron viscosum*, *Bonamia menziesii*, *Brighamia insignis*, *Centaurium sebaeoides*, *Chamaesyce halemanui*, *Ctenitis squamigera*, *Cyanea asarifolia*, *Cyanea recta*, *Cyanea remyi*, *Cyanea undulata*, *Cyperus trachysanthos*, *Cyrtandra cyaneoides*, *Cyrtandra limahuliensis*, *Delissea rhytidosperra*, *Delissea rivularis*, *Delissea undulata*, *Diellia erecta*, *Diellia pallida*, *Diplazium molokaiense*, *Dubautia latifolia*, *Dubautia pauciflorula*, *Euphorbia haeleeleana*, *Exocarpos luteolus*, *Flueggea neowawraea*, *Gouania meyenii*, *Hedyotis cookiana*, *Hedyotis st.-johnii*, *Hesperomannia lydgatei*, *Hibiscadelphus woodii*, *Hibiscus brackenridgei*, *Hibiscus clayi*, *Hibiscus waimeae* ssp. *hannerae*, *Ischaemum byrone*, *Isodendron laurifolium*, *Isodendron longifolium*, *Kokia kauaiensis*, *Labordia lydgatei*, *Labordia tinifolia* var. *wahiawaensis*, *Lipochaeta fauriei*, *Lipochaeta micrantha*, *Lipochaeta waimeaensis*, *Lobelia niihauensis*, *Lysimachia filifolia*, *Mariscus pennatifolius*, *Melicope*

haupuensis, *Melicope knudsenii*, *Melicope pallida*, *Munroidendron racemosum*, *Myrsine linearifolia*, *Nothocestrum peltatum*, *Panicum niihauense*, *Peucedanum sandwicense*, *Phlegmariurus mannii*, *Phyllostegia knudsenii*, *Phyllostegia wawrana*, *Plantago princeps*, *Platanthera holochila*, *Poa mannii*, *Poa sandvicensis*, *Poa siphonoglossa*, *Pteralyxia kauaiensis*, *Remya kauaiensis*, *Remya montgomeryi*, *Schiedea apokremnos*, *Schiedea helleri*, *Schiedea kauaiensis*, *Schiedea membranacea*, *Schiedea nuttallii*, *Schiedea spergulina* var. *leiopoda*, *Schiedea spergulina* var. *spergulina*, *Schiedea stellarioides*, *Sesbania tomentosa*, *Silene lanceolata*, *Solanum sandwicense*, *Spermolepis hawaiiensis*, *Stenogyne campanulata*, *Vigna o-wahuensis*, *Viola helenae*, *Viola kauaiensis* var. *wahiawaensis*, *Wilkesia hobdyi*, *Xylosma crenatum*, and *Zanthoxylum hawaiiense*) that are reported from Kauai and/or Niihau as well as on Maui, Kahoolawe, Lanai, and Molokai. We proposed that critical habitat was not prudent for two species, *Phyllostegia waimeae* and *Melicope quadrangularis*, because they had not been seen recently in the wild, and no genetic material of these species was known to exist. We also proposed that critical habitat was not prudent for three species, *Pritchardia aylmer-robinsonii*, *Pritchardia napaliensis*, and *Pritchardia viscosa*, because it would increase the threat of vandalism to these species.

In the November 7, 2000 proposed rule, we proposed designation of critical habitat on approximately 24,539 ha (60,636 ac) of land on the islands of Kauai and Niihau. The publication of the proposed rule opened a 60-day public comment period, which closed on January 7, 2001. On January 18, 2001, we published a notice (66 FR 4782) announcing the reopening of the comment period until February 19, 2001, on the proposed rule and a notice of a public hearing. On February 6, 2001, we held a public hearing at the Radisson Kauai Beach Resort in Lihue, Kauai. On March 7, 2001, we published a notice (66 FR 13691) announcing the reopening of the comment period and the availability of the draft economic analysis for the proposed rule. This third public comment period was open until April 6, 2001.

On October 3, 2001, we submitted a joint stipulation with Earthjustice 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 January 28, 2002, in the revised proposed rule, we published proposed prudency determinations for 95 plant species from Kauai and Niihau (67 FR 3940). Many of these proposed prudency determinations were incorporated from previous proposals. We also proposed that critical habitat is prudent for four species (*Achyranthes mutica*, *Isodendron pyriformis*, *Phlegmariurus nutans*, and *Solanum incompletum*) for which a prudency determination had not been made previously and that no longer occur on Kauai or Niihau but are reported from one or more of the other islands.

In addition, critical habitat for 83 (*Adenophorus periens*, *Alectryon macrococcus*, *Alsinidendron lychnoides*, *Alsinidendron viscosum*, *Bonania menziesii*, *Brighamia insignis*, *Centaurium sebaeoides*, *Chamaesyce halemanui*, *Ctenitis squamigera*, *Cyanea asarifolia*, *Cyanea recta*, *Cyanea remyi*, *Cyanea undulata*, *Cyperus trachysanthos*, *Cyrtandra cyaneoides*, *Cyrtandra limahuliensis*, *Delissea rhytidosperra*, *Delissea rivularis*, *Delissea undulata*, *Diellia erecta*, *Diellia pallida*, *Diplazium molokaiense*, *Dubautia latifolia*, *Dubautia pauciflora*, *Euphorbia haeleleana*, *Exocarpos luteolus*, *Flueggea neowawraea*, *Gouania meyenii*, *Hedyotis cookiana*, *Hedyotis st.-johnii*, *Hesperomannia lydgatei*, *Hibiscadelphus woodii*, *Hibiscus clayi*, *Hibiscus waimeae* ssp. *hannerae*, *Ischaemum byrone*, *Isodendron laurifolium*, *Isodendron longifolium*, *Kokia kauaiensis*, *Labordia lydgatei*, *Labordia tinifolia* var. *wahiawaensis*, *Lipochaeta fauriei*, *Lipochaeta micrantha*, *Lipochaeta waimeae*, *Lobelia niihauensis*, *Lysimachia filifolia*, *Mariscus pennatifolius*, *Melicope haupuensis*, *Melicope knudsenii*, *Melicope pallida*, *Munroidendron racemosum*, *Myrsine linearifolia*, *Nothocestrum peltatum*, *Panicum niihauense*, *Peucedanum sandwicense*, *Phlegmariurus nutans*, *Phyllostegia knudsenii*, *Phyllostegia waimeae*, *Phyllostegia wawrana*, *Plantago princeps*, *Platanthera holochila*, *Poa mannii*, *Poa sandvicensis*, *Poa siphonoglossa*, *Pteralyxia kauaiensis*, *Remya kauaiensis*, *Remya montgomeryi*, *Schiedea apokremnos*, *Schiedea helleri*, *Schiedea kauaiensis*, *Schiedea membranacea*, *Schiedea nuttallii*, *Schiedea spergulina* var. *leiopoda*,

Schiedea spergulina var. *spergulina*, *Schiedea stellarioides*, *Sesbania tomentosa*, *Solanum sandwicense*, *Spermolepis hawaiiensis*, *Stenogyne campanulata*, *Viola helenae*, *Viola kauaiensis* var. *wahiawaensis*, *Wilkesia hobdyi*, *Xylosma crenatum*, and *Zanthoxylum hawaiiense*) of the 95 plant species was proposed on approximately 40,147 ha (99,206 ac) of land on Kauai and 282 ha (697ac) of land on Niihau (67 FR 3940). Critical habitat was not proposed for *Achyranthes mutica*, *Hibiscus brackenridgei*, *Phlegmariurus mannii*, *Silene lanceolata*, and *Solanum incompletum* on the island of Kauai and for *Isodendron pyriformis* and *Vigna o-wahuensis* on the island of Niihau because these plants no longer occur on Kauai or Niihau, and we were unable to identify habitat essential to their conservation on these two islands.

Because *Phyllostegia waimeae* had been rediscovered, we revised an earlier proposal to suggest that critical habitat would be prudent and propose critical habitat for this species in the revised proposed rule.

The publication of the revised proposed rule opened a 60-day public comment period, which closed on March 29, 2002. On February 11, 2002, we published a correction notice (67 FR 6214) correcting information contained in the January 28, 2002, revised proposal pertaining to the notice of a public hearing. On February 13, 2002, we held a public hearing at the Radisson Kauai Beach Resort in Lihue, Kauai. On May 28, 2002, we published a notice (67 FR 36851) announcing the availability of the draft economic analysis for the designation of critical habitat for 83 Kauai plants and reopening the public comment period until June 27, 2002. On August 26, 2002, we published a notice (67 FR 54766) reopening the public comment period until September 30, 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 review 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 September 3 and 4,

2002, we held public meetings at the Waimea Community Center, Waimea, Kauai, and the War Memorial Convention Center, Lihue, Kauai, respectively.

On January 9, 2003, we determined that critical habitat was prudent for the following 15 species: *Adenophorus periens*, *Bonamia menziesii*, *Centaurium sebaeoides*, *Ctenitis squamigera*, *Cyperus trachysanthos*, *Diellia erecta*, *Diplazium molokaiense*, *Hibiscus brackenridgei*, *Isodendron pyriformis*, *Sesbania tomentosa*, *Silene lanceolata*, *Solanum incompletum*, *Spermolepis hawaiiensis*, *Vigna owahuensis* and *Zanthoxylum hawaiiense* (68 FR 1220), which also occur on Kauai or Niihau.

Summary of Comments and Recommendations

We received a total of 20 oral and 2,740 written comments during the three comment periods. These included responses from 7 State offices, 5 public officials, and 70 private organizations or individuals. Of the written comments, we received approximately 680 letters by facsimile and 1,998 electronic letters by e-mail, which stated general support for the proposed critical habitat designations, but that did not provide substantive comments. Of the other 82 comments, nine supported the designation, 60 were opposed to it, and 13 provided information but did not state a position on the designation. We reviewed all comments received for substantive issues and new information regarding critical habitat and the Kauai and Niihau plants. Similar comments were grouped into nine general issues relating specifically to the proposed critical habitat designations and the draft economic analysis on the proposed determinations. 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 23 knowledgeable individuals with expertise in one or several fields, including familiarity with the species, the geographic region, or the principles of conservation biology. We received comments from eight. All eight generally supported our methodology and conclusion, but none expressed a position for or against the designation of critical habitat. Comments received from the peer reviewers are summarized in the following section and incorporated into the final rule.

Issue 1: Biological Justification and Methodology

(1) *Comment:* One peer reviewer commented that there is no easy way to assess the match between the Service's proposed boundaries and the summation of habitat requirements of the individual taxa in each unit. Specifically, the intermediate step of indicating the species models for each of the listed taxa that is combined into the aggregate polygons that form the basis for the unit boundaries is not well documented. This leaves the reviewer with little basis to assess the match between habitat of the listed taxa and inclusion of such habitat in the critical habitat units. Species should be addressed individually, but the designation of conservation areas (or critical habitat) can and should consider the use of common areas to provide for multiple species. Another commenter stated that the Service's analysis has not demonstrated that inclusion of controversial areas has been minimized. There is no way to tell whether all of a given unit is necessary for that subset of taxa, which absolutely require the habitat found in that unit. The discussion of how each critical habitat unit provides for individual species helps one understand the reason for proposing the unit. However, additional information is needed in some instances (e.g., units J and N). The Service must justify every acre of land proposed for critical habitat designation, identify the specific species scheduled for recovery on that land, and explain why specific acreages are needed to do so.

Our Response: In response to these concerns, we have included the critical habitat maps and unit justifications for each species in the final rule, as well as descriptions of primary constituent elements and a composite map showing the overlap of the areas for all of the species combined.

(2) *Comment:* The majority of our peer reviewers agreed that the methodology is appropriate, scientifically well-grounded and conceptually sound. The approach of mapping the elevation, moisture, and habitat type for the listed taxa to the landscape is a sound approach to designating critical habitat. It seems that there is a good match of habitat identified long-term conservation of multiple populations of the listed species. The methodology uses information on species elevation range, vegetation type, associated species, physical location, and community type. It will allow the Service to revise or update habitat units as new information becomes available. This is more likely to provide habitat for

the recovery of these species. The proposed rulemaking represents the best scientific information available and is a scientifically appropriate technique for determining critical habitat on Kauai. On the other hand, some commenters felt that the proposed rule was an overly broad approach to designating critical habitat not based on scientific principles and knowledge of the needs of these plant species unique to the island State of Hawaii, but on litigation and the threat of future litigation. Additional consultation with academic and professional experts was recommended. Some reviewers stated that no assessment of the quality of any of the data sources is provided, and no information is given as to how data sources of varying qualities were weighted in making delineations of critical habitat or how decisions were made as to what to rely on in the absence of rigorous assessments of relative quality. These commenters agreed with the Service's statement that "lack of detailed scientific data makes it impossible for us to develop a quantitative model." Lack of knowledge means that the proposed critical habitat designation is based only on the general habitat features of the areas in which the plants currently occur. While this approach may be expedient, it has resulted in designations based on best guess estimations, rather than on science or the realities of plant recovery. The Service needs to give greater weight to scientific or commercial data that is empirical and has been field tested or verified, and needs to allow peer review by a panel of unbiased scientists. Other commenters felt the data on which the proposed critical habitat is based is 30 years-old and may need updating. The proposed critical habitat covers too much acreage and was put together too quickly, using obsolete data, sloppy science, and lots of guess work.

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 designation methodology of critical habitat of Kauai plants was based on scientifically sound data, assumptions, and analysis. The comments of the peer reviewers were taken into consideration in the development of this final designation. The majority of the peer reviewers support our methodology. All data and information on species status received in preparation of this rule was equally weighted and considered to come from reliable sources. Where

discrepancies existed between different data sources, the most current data were used. Changes in this final rule that decrease the boundaries of many units are based on additional information received during the public comment period and in meetings with additional species experts and land managers who were not available for comment during the preparation of the proposals. The changes in boundaries reflected in this final rule are based on additional information about areas lacking primary constituent elements or those that are too degraded to be restored. While we agree that additional time would be beneficial for the preparation of these final rules, we are required under the court-approved stipulation to finalize this designation by January 31, 2003. If provided with new information, we may revise the critical habitat designation in the future.

(3) *Comment:* One peer reviewer asked if the Service considered modeling the potential distribution based on known habitat correlates, as in Elith and Burgman (2002). Another peer reviewer stated that the Service should use spatial modeling of estimated values of selected habitat parameters for each species (such as elevation, median annual rainfall, vegetation units) as a first step in the process, rather than screen-digitizing. Some of the data on primary constituent elements (e.g., breeding system, dispersal mechanisms) can be inferred from similar species, but other pieces of critical information may not be currently available and should be the subject of further research. After the preliminary habitat polygons are identified, historic range can be determined either objectively or subjectively based on the known location points for a particular species. The steps going from narrative descriptions of habitat elements to geographical units are not well documented. The Service should elaborate on its methodology for defining the primary constituent elements for each species and the subsequent critical habitat.

Our Response: We agree that modeling of potential distribution within historic range is important, and have used this type of modeling, based on the limited available information. We did not feel that valid habitat parameters for each species could be developed without first digitizing known current and historic range and using that information, along with available digitized information on elevation, rainfall, and vegetation units, to determine potential habitat. Using the information from existing and historically known plant locations, we

used available digitized information on elevation, rainfall, and vegetation units, as well as advice from species experts, to model the potentially suitable habitat for each species. The critical habitat designated is the subset of suitable habitat that was determined to be essential to the conservation of each species (see the "Methods" section for more detail).

(4) *Comment:* Some reviewers commented that deletion of significant portions of any of the proposed critical units is likely to prevent the recovery of, and lead to the extinction of, listed species. Smaller units present real management challenges and may be so small that their ecological integrity and the viability of listed plants can't be maintained. The new proposal indicates that a wide range of habitats are covered in the areas proposed by the Service as critical habitat units. Units have been expanded to provide contiguous blocks of habitat that will reduce fragmentation and edge effects and are large enough to offer a variety of microsites. This will also improve the ability of listed species to maintain gene flow, reestablish populations following population declines or catastrophes, and to colonize new areas. However, the amount of dry and mesic forest included in proposed critical habitat is still very limited. Protecting critical habitat is essential not only for the recovery of threatened and endangered plant species, but also to protect the ecosystems on which these species rely for their long-term survival and recovery. Management actions for critical habitat need to allow for the expansion of populations and include the ecological matrix in which critical habitat is embedded. It is important that the adjacent noncritical habitat areas be managed for control or elimination of nonnative species, if recovery is to be achieved for the areas of less than 1,000 acres. On the other hand, some commenters felt that the increase in acreage from the first to the second proposal was the Service's attempt to get the community to be willing to go back to the original proposal. One commenter asked what the Service would do if newly obtained, good quality, scientific information proves the current best scientific knowledge is totally inaccurate.

Our Response: The Act requires us to use the best available scientific and commercial information in undertaking species listing and recovery actions, including the designation of critical habitat as set forth in this rule. In this final rule, we concluded that many areas were not essential for the conservation of the Kauai plant species, based on newly available information

concerning status of the species in specific areas and level of habitat degradation. Several units or portions of units proposed as critical habitat have been excluded because they are not essential for the conservation of the species. We determined them to be non-essential due to their lacking primary constituent elements, or having primary constituent elements but there are other places for these species that have more primary constituent elements and/or are less degraded. See the "Summary of Changes from the Revised Proposed Rule" section for the justification for each unit's changes.

We realize that smaller areas will most likely require more management to maintain the plant populations and their habitat, but in many cases they are the only areas with the primary constituent elements needed for each species. We concur on the importance of protecting the ecosystems on which these species depend, as stated in purpose of the Act (section 2(b)), and of managing areas large enough to maintain and expand populations. We considered the importance of this, as well as the location of primary constituent elements, when delineating the boundaries of critical habitat for these final designations of critical habitat. We included areas that provide the biological and other processes that are essential for the conservation of the species. We acknowledge the potential negative impacts of edge effects on small habitat fragments. However, these species' primary constituent elements are found only within the areas that were designated critical habitat, and making them larger would add areas that lack the primary constituent elements. All of the changes in critical habitat from the first proposal, through the second, to this final, are based on the best available information received during comment periods, and are based on biological issues, not political or social issues. If new information becomes available indicating the existing critical habitat designations are not essential for the conservation of the species and/or that other areas are, we may propose revised designations for those species at that time.

(5) *Comment:* Critical habitat designation should be primarily directed toward areas that are currently being intensively managed or may be the subject of conservation agreements in the future for those species that are known to naturally occur in these habitats. A suggested method is that once realistic management units have been identified based on the management factors to address limiting factors (e.g. fence lines, fire control), the

next step is to see how many distinct populations of each plant species exists or can be established within those units to meet the species overall habitat needs to support eight to ten populations. Only after this analysis has been made and found to be lacking, would you start looking outside these management units for other lands needed. The commenter believes that this approach not only meets the legal requirements for critical habitat designation, but provides the best approach for recovery of the species.

Our Response: We agree that managed areas containing current or historic populations are vitally important to the conservation of the species, and have included managed areas on Kauai with appropriate primary constituent elements in critical habitat. Managed lands are not included only if management is sufficient to demonstrate that special management considerations or protection are not required, pursuant to 16 U.S.C. 1532(5)(A)(i). See "Managed Lands." However, these areas alone or in conjunction with other areas that may be managed in the future do not include all of the habitat essential for the Kauai and Niihau species. Therefore, we have designated these managed areas along with additional areas outside of managed units as critical habitat. In our final analysis, for each species, we ranked areas of the proposed critical habitat by the quality of the primary constituent elements, potential as a recovery area, and current or expected management of known threats. Areas that contain high quality primary constituent elements, are zoned for conservation, and have on-going or expected threat abatement actions were given high ranks. Of these highly-ranked areas, we selected adequate area 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 highly ranked and that may provide habitat for populations above the recovery goal of 8 to 10, were determined not essential for the conservation of the species and were excluded from the final designation (see "Criteria Used to Identify Critical Habitat").

(6) *Comment:* Designate critical habitat for Federal lands only.

Our Response: Federal lands on the island of Kauai include the Navy's Pacific Missile Range Facility (PMRF) at Barking Sands and Makaha Ridge and the Service's Kilauea Point National Wildlife Refuge, Hanalei National Wildlife Refuge, and Huleia National Wildlife Refuge. In this final rule, we are designating critical habitat for *Panicum niihauense* at Barking Sands,

as this dune habitat is essential for the conservation of this species. This dune habitat is not essential for the conservation of the other 82 species at issue on Kauai. In this final rule, we are not designating critical habitat for *Wilkesia hobbii* at Makaha Ridge, as this habitat is not essential for the conservation of this species. This habitat is not essential for the conservation of the other 82 species at issue on Kauai. None of the 83 species at issue on Kauai are known currently or historically from the Service's refuges at Kilauea Point, Hanalei, or Huleia, and these Federal lands are not essential for the conservation of the 83 species at issue on Kauai.

(7) *Comment:* The Service cannot lawfully exclude areas from critical habitat based on a finding that they currently are adequately managed or protected. To do so would violate the mandatory duty to designate critical habitat to the maximum extent prudent and determinable. The commenter urges the Service not to exclude any areas from designation on this basis (already managed or protected), since doing so would violate the mandatory duty to designate critical habitat "to the maximum extent prudent and determinable."

Our Response: We disagree as "special management considerations or protection" is part of the definition of critical habitat and must be given meaning when designating critical habitat. Specifically, we believe that adequate special management consideration or protection could be provided by a legally operative plan or agreement that addresses the maintenance and improvement of the primary constituent elements important to the species and manages for the long-term conservation of the species. However, for this designation we did not identify essential habitat features that already have adequate management and would not be included on that basis.

(8) *Comment:* Several commenters supported the Hawaii Division of Forestry and Wildlife proposal for designating critical habitat on existing managed areas as these areas are where the limiting factors for species conservation can be addressed. Furthermore, one landowner noted that a large portion of his/her lands are managed by the Hawaii Division of Forestry and Wildlife.

Our Response: We agree that the State DOFAW staff have valuable on the ground experience and scientific information that has been essential to our critical habitat decision making process. However, we did not adopt

DOFAW's first proposal (January 11, 2001) as it did not adequately address all of the conservation needs of the species in accordance with the Act. After publication of the January 28, 2002, revised proposed critical habitat rule, we met several times with Kauai DOFAW staff and conducted several site assessment surveys. As a result of the assessment surveys and information provided to us by Kauai DOFAW staff, we were able to better identify areas that did not contain primary constituent elements. In addition, we received important information from Kauai DOFAW staff that enabled us to refine the final critical habitat designations to better meet the conservation needs of the species.

(9) *Comment:* One commenter stated that it is extremely difficult to come up with a biologically sound definition of a population that can be realistically applied to the distribution and abundance of a rare species in the wild. However, the commenter noted that defining separate populations as being more than 1,000 meters apart is both biologically meaningful and operationally useful and serves as the focus of the Army's species stabilization efforts in the Waianae Mountains of Oahu. A commenter noted that the separation distance of 1,000 meters is probably adequate for most small-scale disturbance events, but will be inadequate for large-scale disturbances. The problem of defining populations requires knowledge of gene-flow patterns. The commentator recognizes that the proposed targets for population recovery are initial and not derived from any detailed understanding of genetic architecture. The commentator recommends altering these objectives, but would suggest that the Service state the need for more studies on population genetics. In addition, the targets present a demographic challenge to achieve a population of 100 mature individuals and will require massive plantings to counteract mortality. These practical challenges should be made clear.

Our Response: We agree that the operational definition of 1,000 meters between separate populations is adequate in the absence of information on the specific biological requirements of a population for each species. The need for genetic and demographic studies and the understanding of challenges to reintroduction are addressed in the species' recovery plans.

(10) *Comment:* Many commenters stated that a multi-population approach is essential for the conservation of many of the rare Hawaiian plant species, since the purpose of critical habitat and

recovery in general is to eventually have wild populations that are self-sustaining and no longer in need of protection under the Act. The strongest argument for this strategy is the fact that these populations are subject to many types of catastrophic events, ranging from widespread phenomena such as hurricanes, wildfire, or ungulates, to localized events like landslides, predators, or even disease outbreaks. The multi-population approach offers the opportunity to protect wider latitude of genetic variability for the species as a whole, rather than concentrating on a single or small number of areas with genetically more similar individuals. The Service's use of Hawaii and Pacific Plant Recovery Coordinating Committee (HPPRCC) guidelines for population size and numbers of populations needed to maintain Hawaiian plant taxa are probably the best general guide, since the general tenets of minimum viable population size and numbers are not defined for Hawaiian taxa. The targets (8 to 10 from 100 to 500) used in the critical habitat designations are generally lower than those used by the HPPRCC to identify essential habitat for listed plants and should be considered as the "low end" of what is likely needed for recovery.

Our Response: We agree that the multi-population approach to conservation is necessary for the recovery of Hawaii's endangered plants. We have used the lower end of the HPPRCC guidelines, as that is what the Service believes is essential to the conservation of the species, based on the current conservation literature (see "Criteria Used to Identify Critical Habitat" section).

(11) *Comment:* Two peer reviewers stated that just because a species is found in a certain habitat now does not mean that this habitat is the best place for it to thrive and reproduce. For example, repeated references to steep slopes as being primary constituent elements of critical habitat should not be construed as representing optimum habitat; they are likely remnant populations. The current distribution of a species today may not be a good indication of its optimal habitat, for example dry and mesic forest plants that are historically known only from lowland areas and not high elevation areas (where relatively more complete data are found); areas that were extremely degraded before good records were kept on species distribution and habitat needs.

Our Response: 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. In our designation, we used the best scientific and commercial data available, both historic and current, from a variety of sources (see "Methods" section) to specify any particular area as critical habitat (section 4(b)(2) of the Act) and to determine the physical or biological features essential to the conservation of the species (section 3(5)(A) of the Act). As pointed out by reviewers, biological information is extremely limited for many species, and therefore the only information available may indicate the species is restricted to a particular topography, soil or forest type. No critical habitat was designated for a species outside of its known historic range or known suitable habitat.

(12) *Comment:* Several comments were received in support of the designation of unoccupied habitat. Unoccupied habitat within critical habitat is important for natural dispersal of plant populations beyond their current distribution as well as providing sites for reintroduction of new populations if needed. The biological needs of the species are well enough known to warrant the protection of unoccupied habitat. These unoccupied areas will be especially important to dry and mesic forest species. Protecting unoccupied habitat is essential since currently occupied areas are inadequate for recovery. On the other hand, several comments were also received against the designation of unoccupied habitat. Some felt that at least 70 percent of the proposed critical habitat is not really habitat at all, in that it is not inhabited by any of the species but is unoccupied. Because there is no data to show that excluding these areas will result in the extinction of the species, the Service should omit them from consideration. Several areas do not contain listed species or do not contain records of historic sightings and so do not appear to be warranted as essential for the conservation of any species. The lands that could be excluded from critical habitat without causing the species to go extinct include Unit D1, D2, N, L, and private lands. Other commenters were concerned that is difficult for the Service to justify its expanded proposed designation if it does not know what physical and biological features are essential to the species' growth, germination or methods of seed dispersal as required by its own rules. The vast majority of the proposed areas are presently unoccupied by the species in question and their successful

introduction to and survival in these areas is speculative. These commenters believe that the first proposed designation was correct.

Our Response: Our recovery plans for these species (Service 1994, 1995, 1996, 1997, 1998a, 1998b, 1998c, 1999) identify the need to expand existing populations and reestablish wild populations within historic range. We have revised the designated critical habitat in the final rule to incorporate new information and/or address comments and new information received during the comment periods, including information on areas of potentially suitable unoccupied habitat for some of these species. Many of the units have been reduced based on this newly available information. However, for most of the species, there are not enough existing populations and most of them are not currently viable. While they may continue to exist at their current low numbers until a catastrophic event causes their extinction, the Service's goal, as stated in section 2(b) of the Act, is to recover the species. Therefore, the protection of additional unoccupied critical habitat is essential to ensure the recovery of these species through reintroduction. We also realize that, although propagation and reintroduction are difficult for some species, both are vitally important to their recovery. Many recovery plans therefore include research into best methods of propagation and reintroduction as important tasks prior to attempting reintroduction.

(13) *Comment:* Some commenters stated that good quality habitat should be designated in lieu of more degraded habitat. However, degraded areas should only be excluded from proposed critical habitat if they lack the ability to become habitat in the future. On the other hand, some commenters said that they see little on-the-ground logic to defend designations of unoccupied habitat and believe the Service must have other strategies rather than just carving out land areas, especially in highly degraded or altered habitats. In some instances, all potential habitats for a species have been degraded to the point that alien species dominate the site. Recovery efforts in these situations need to include both species management, coupled with habitat restoration efforts.

Our Response: We agree that recovery of a species is more likely in higher quality habitat containing the physical or biological features essential to the conservation of the species. To this end, several units have been excluded for some species, as sufficient area is available in less degraded areas. However, for some species, particularly

those only known from low elevation areas, only degraded habitat remains. Therefore, some units still contain degraded habitat, but only if experts agreed that the areas could be restored. Management for the restoration of these habitats is addressed in the species' recovery plans.

(14) *Comment:* The recovery effort in Hawaii will not be effective without a well-developed and implemented management strategy. The designation of critical habitat without adequate management does not necessarily ensure benefit or recovery to a plant species. Some of the critical habitat units cannot sustain the projected recovered populations at current levels of habitat management and investment. Control of key threats such as feral ungulates, alien weeds, and wild fires is crucial to the recovery of listed plants. Alien species are significant problem that need to be addressed in order to be effective in the conservation of Hawaiian plants and animals. However, the land managers have not been able to control some invasive weeds, such as banana poka and lantana. There are workable methodologies for dealing with some of the factors that affect listed species and critical habitat (e.g., fencing and removal of ungulates). For other factors, such as lost pollinators, dispersers, or climate change, effective and appropriate techniques are still being sought. However, from a practical standpoint, if efforts to save threatened and endangered species were dependent on full knowledge of all factors relating to their survival, few if any would have a chance. This lack of knowledge or control tools should not be a reason to give up on recovery efforts for the native species that are affected. Waiting for all factors to be identified and validated would perpetuate current levels of habitat loss and/or management inaction.

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 the species, and the Service is directed to designate critical habitat based on the best available scientific and commercial information. The management of alien species is an important conservation issue that is addressed in the recovery plans for these species. Other, less understood issues are identified in the recovery plans as requiring research to determine appropriate actions. The Service's role in the recovery of these species is to work with other agencies, organizations, and individuals to coordinate the implementation of the recovery plans in a strategic manner.

(15) *Comment:* "Reduced reproductive vigor due to small numbers of extant individuals" or inbreeding depression should not be cited as potential problems unless species-specific information is available. Hawaii's endangered species are biologically incompetent, and totally unable to repopulate the vast areas you are proposing as critical habitat. They should just be grown in a garden setting, since that is the only way they will survive. Extinction is a natural part of evolution.

Our Response: We are required under section 4 of the Act to designate critical habitat based on the best available information we have at the time of designation. In addition, we are directed by the Act to recover the species and the ecosystems on which they depend, not just preserve them in a horticulture facility. We realize that designation of critical habitat alone will not achieve recovery. Many of the species have been reduced to such low numbers that the recovery plans identify propagation and reintroduction as a key step. While we do not have direct evidence for most species to indicate that reduced reproductive vigor or inbreeding are problems, we believe they should be considered, based on current conservation biology theory and practice. This is particularly important to consider when developing a propagation and reintroduction program, to ensure that recovery efforts do not cause or exacerbate genetic issues. We also realize that management of the habitat is essential to the species' recovery. All of these issues are addressed in the species' recovery plans. And, while extinction is a natural part of evolution, there are numerous references in the conservation literature that the rate of extinction today is unprecedented.

(16) *Comment:* It should be noted that in many cases disturbance has been shown to contribute to the survival of species when it occurs at an appropriate level and at appropriate intervals.

Our Response: For some species it may be true that disturbance was a natural process that may have benefitted the species in the past. Today, however, many listed species are greatly reduced in numbers and occur in fragmented habitats that have been highly altered by alien species, to the point that the natural disturbance process is no longer present. When disturbances, such as hurricanes, do occur now, the most likely result is an increase in alien species, rather than native habitat. In addition, the small numbers of remaining individuals in greatly reduced ranges are far more vulnerable

to extinction from one disturbance event, whether natural or human-caused.

(17) *Comment:* The proposal failed to contain the total of historically known listed plants, and therefore failed to propose critical habitat for all listed plants statewide. About 10 percent of the historically known listed endangered plant species from the Hawaiian islands are missing from the proposal. The following endangered plant species lack critical habitat on Kauai and/or Niihau: *Caesalpinia kavaensis*, *Haplostachys haplostachya*, *Hibiscadelphus distans*, *Marsilea villosa*, and *Scaevola coriacea*.

Our Response: These species were not part of the lawsuit 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.

(18) *Comment:* One peer reviewer stated that the Service did consider the entire range of plants found on multiple islands, particularly since they are going through the same process of designation of critical habitat on all of the Hawaiian Islands. On the other hand, some commenters stated that the revised proposal's treatment of "multi-island" plants historically, but not currently, found on Kauai or Niihau makes it impossible to determine whether the Service is complying with its statutory duty to identify adequate habitat for these species' recovery. By proposing critical habitat island-by-island, rather than species-by-species, there is no way for reviewers to know what areas statewide ultimately will be proposed for the multi-island species. The revised proposal's treatment of "multi-island" plants historically, but not currently, found on Kauai or Niihau makes it impossible to determine whether the Service is complying with its statutory duty to identify adequate habitat for these species' recovery.

Our Response: In response to this concern, the Service reopened the comment periods for the proposed designations and nondesignations of critical habitat for plant species on the islands of Kauai, Niihau, Molokai, Maui, Kahoolawe, northwestern Hawaiian Islands, Hawaii, and Oahu after these proposals were published. This comment period, which was open from August 26, 2002 to September 30, 2002, allowed all interested parties to submit written comments on these proposals simultaneously and address issues associated with multi-island species.

(19) *Comment:* The boundaries of critical habitat should follow elevation contours, ridge lines, and other natural

features that naturally delineate the units, rather than long, straight-line segments.

Our Response: The boundaries of the proposed critical habitat designations were generalized for ease of mapping. With this final rule, the new units are separately mapped for each species and are more true to the elevation contours, the distribution of habitat, and other natural features.

(20) *Comment:* The agricultural and grazing lands proposed for designation will never contribute to the conservation of these species, they are certainly not essential, and it is doubtful that listed species still occur on these lands.

Our Response: When delineating critical habitat units, we made an effort to avoid developed areas such as towns, agricultural lands, and other lands with similar features that do not contain the primary constituent elements. Less than one percent of the critical habitat designated in this final rule is within lands districted as agricultural lands, with most of the designated critical habitat in lands districted as conservation lands. However, some species, such as *Ischaemum byrnone* and *Sesbania tomentosa*, only occur in low elevation areas where agriculture is most common, and enough habitat necessary for the conservation of the species that contains some of the primary constituent elements and can be restored to have all of the primary constituent elements is not available outside of agriculturally zoned lands.

(21) *Comment:* One commenter asked if "historical" equals post-Polynesian, or post-European, or is it defined by the prevailing climate. The dates of population extirpations should be provided (e.g., *Delissea rhytidosperra*). These dates are important in defining "historical" sightings.

Our Response: The Service's definition of the term "historical" is any plant location information gathered prior to the 1970s. The term does not refer to post-Polynesian or post-European time periods, and is not defined by the prevailing climate. Documented botanical collections in the Hawaiian Islands began in the late 1700s and continued intermittently through the early half of the 20th century. In the early 1970's there was a renaissance in Hawaiian botanical surveys that continues today. This included the establishment of several botanical gardens (e.g. National Tropical Botanical Garden in 1970; Lyon Arboretum in the early 1970s), which have served as an important source of information on native plant species status and locations. The passage of the

National Environmental Policy Act in 1969 also encouraged increased surveys of areas as part of the EA/EIS process and thus provided support for private contract botanists whose work entered the public arena as addenda to EAs and EISs. This invigorated effort to document the occurrences of Hawaiian plants was also accompanied by observations on the loss of plant populations from previously known locations due to habitat loss and impacts of free ranging ungulates. These observations lead to a more regular documentation of the causes of decline of Hawaiian plants. Prior to the 1970s, such impacts were rarely recorded even though declines in Hawaiian plant populations were noted. Also at this time there was a growing national recognition that species of plants and animals were being threatened by extinction due to human activities. This concern lead to the passage of the U.S. Endangered Species Act in 1973.

(22) *Comment:* *Phlegmariurus nutans* has survived for at least a century without having any habitat on Kauai. If these plants could grow or be cultivated anywhere else, the designated area is not essential. Designating more such areas as critical habitat would not improve that species' chances of survival. Much of the area that would be restricted from human use by the critical habitat designation may be useless to the species that the Service is trying to protect. Four of the plants have not been seen in more than 30 years, and two others were reported as having been seen within the past 30 years on Kauai. Critical habitat should only be designated for areas that host existing populations of the designated species. If a species is gone from an area, it could mean that the designated area is no longer ideally suited to support that species for one reason or another (water table may have changed, ground may have become more saline, animal or insect encroachment, etc.) so no matter what actions are prescribed, the species will most likely not return and successfully thrive in that environment. A critical habitat area should not be designated for a species that does not already live in it if there is no reasonable way for the species to get to that area under its own power. If it has to be artificially transported, then that area should not be designated. On the other hand, two of the plantiffs supported the Service's inclusion of critical habitat designation for seven species not currently known from Kauai: *Ctenitis squamigera*, *Diellia erecta*, *Diplazium molokaiense*, *Ischaemum byrnone*, *Mariscus*

pennatiformis, *Phlegmariurus nutans*, and *Phyllostegia waimeae*.

Our Response: We designated critical habitat for those species not recently seen on Kauai only if historic information was available on the primary constituent elements for those species on Kauai and if such areas still exist with those primary constituent elements or in which the primary constituent elements can be restored. We agree that the species will most likely not disperse to these sites under natural circumstances, because the intervening areas are often not suitable habitat for the species or have become too degraded, or because the pollinator may be lacking in those areas. Therefore, recovery plans include propagation and reintroduction into currently unoccupied but historical habitat. While not all designated critical habitat may contain all the primary constituent elements in their present condition, we believe that they can be restored with management actions.

(23) *Comment:* The Service has undertaken a detailed evaluation of the proposed critical habitat areas on State lands on Kauai to assess how much of the unoccupied habitat is really essential and which lands can be effectively managed for the benefit of the species. The Service should extend its evaluation to private land and land on other islands.

Our Response: We agree, and have met with any landowner who has requested to discuss and visit their lands. Many of those discussions have resulted in changes to some of the critical habitat units, as described in the "Summary of Changes from the Revised Proposed Rule" section.

(24) *Comment:* The hunters, hikers, and local people are the first line resources in protecting these plants, and at no cost to the government. Spend Federal monies to educate and teach the local people, rather than on critical habitat designation.

Our Response: We agree that the local people are an excellent resource to aid in the management of endangered species. For example, the Service has funded for several years a weed control project in the Kokee area of Kauai which operates largely on local volunteer efforts. While these management efforts are extremely beneficial for endangered species protection, section 4 of the Act still requires the Service to designate critical habitat.

(25) *Comment:* The statement that designating critical habitat would not provide significant benefits to the *Pritchardia* species is flawed because critical habitat designation would help them to recover to a non-imperiled

status. The Service did not base its original "not prudent" finding on the likelihood that designation would increase threats, as it now attempts to do. Nor does it explain why designating critical habitat on the privately owned island of Niihau would increase collecting beyond current levels.

Our Response: Since the listings of the three *Pritchardia* species on Kauai and Niihau as endangered, and prior to our proposed rules for the designation of critical habitat, we received information verifying vandalism and collection threats to *Pritchardia* throughout the Hawaiian Islands. This information is included in the proposed rules. We have revised critical habitat designations based on additional information received during comment periods. However, no additional information was provided during the comment periods demonstrating that the threats to the *Pritchardia* species on any Hawaiian Island from vandalism or collection would not be increased if critical habitat was designated. We still believe that the benefits of designating critical habitat do not outweigh the potential threats from vandalism and collection of these three species of *Pritchardia*.

(26) *Comment:* The revised proposal identifies as critical habitat only the habitat that *Hibiscus clayi* currently occupies, despite the Service biologist's concession that this area alone is inadequate to support the recovery of the species.

Our Response: We agree that the area proposed as critical habitat for *Hibiscus clayi* is inadequate for the recovery of the species. During the public comment period, we received additional information, and have designated five other units of critical habitat for this species within the previously proposed unit M (now Unit 4), based on the presence of primary constituent elements. Habitat has been designated for six populations, however we do not have information on other locations or additional areas that are suitable or essential for this species.

(27) *Comment:* The expansion of the area in the revised proposal raises concerns about the limited data used in the mapping process.

Our Response: When developing the proposal to designate critical habitat for 83 plants from Kauai and Niihau, we used the best scientific and commercial data available, including but not limited to, information from the known locations, site-specific species information from the HINHP database and our own rare plant database; species information from the Center for Plant Conservation's (CPC) rare plant

monitoring database housed at the University of Hawaii's Lyon Arboretum; the final listing rules for these species; information received at the three informational open houses held on Kauai at the Waimea Community Center, the Kauai War Memorial Convention Hall in Lihue, and the Kilauea Neighborhood Center, on October 19 to 21, 1999, respectively; recent biological surveys and reports; our recovery plans for these species; information received in response to outreach materials and requests for species and management information we sent to all landowners, land managers, and interested parties on the islands of Kauai and Niihau; discussions with botanical experts; recommendations from the Hawaii Pacific Plant Recovery Coordinating Committee (HPPRCC) (Service 1994, 1995, 1996, 1997, 1998a, 1998b, 1998c, 1999; HPPRCC 1998; HINHP Database 2000; CPC *in litt.* 1999); Geographic Information System (GIS) coverages (e.g. vegetation, soils, annual rainfall, elevation contours, land ownership); new information; completed recovery plans; and information received during the public comment periods and public hearings.

(28) *Comment:* What would make sense is for the Service to develop a plan for human intervention, including the required funding, and then designate selected areas as critical habitat.

Our Response: Recovery plans, in which human intervention actions are recommended for the conservation of all of the 83 plants that are the subject of this critical habitat rulemaking, have already been developed (Service 1994, 1995, 1996, 1997, 1998a, 1998b, 1998c, 1999). In the recovery plans we identified habitat areas deemed essential to the recovery of these plant species and referred to these areas during our development of the critical habitat designations.

(29) *Comment:* The designation of critical habitat in unoccupied habitat is particularly important, since this may be the only mechanism available to ensure that Federal actions do not eliminate the habitat needed for the survival and recovery of extremely endangered species.

Our Response: We agree. Our recovery plans for these species (Service 1994, 1995, 1996, 1997, 1998a, 1998b, 1998c, 1999) identify the need to expand existing populations and reestablish wild populations within historic range.

(30) *Comment:* There cannot be adequate assessment of possible impacts by a proposed Federal action to a species that is not there any more. Such

an assessment is impossible without a total analysis of why a plant species no longer occurs in a region.

Our Response: In cases where a proposed Federal action takes place in unoccupied critical habitat, we will assess whether the proposed action is likely to destroy or adversely modify the primary constituent elements that are needed for the future conservation of the species in question. If we find that the proposed action will appreciably diminish the habitat's value for both survival and recovery of the species, we will recommend reasonable and prudent alternatives.

Issue 2: Site-Specific Biological Comments

(31) *Comment:* The proposed rule could and should have included a more detailed discussion of why the revision included an expansion of critical habitat units in northwestern Kauai (*i.e.*, units O and I).

Our Response: We agree that a more detailed discussion of why areas are included and excluded from each unit would be helpful. Therefore, in "Summary of Changes from the Revised Proposed Rule" section, we have given detailed descriptions for each species of why the units have changed.

(32) *Comment:* Unit D does not contain any listed species and so does not appear to be warranted as essential for the conservation of the species. Areas in units D1, D2, and E that do not contain the primary constituent elements should be remapped in the final rule. The critical habitat area on the beach was proposed to be limited to the dunes on the southern portion of the parcel, to what is commonly known as "Long Beach." The lower slopes of the Haupu range and the Kipu/Kipukai/Hoary Head range in Unit E are covered by *Eucalypts robusta*, *Melaleuca*, *Grevillea*, *Casuarina*, mango, Java plum, catclaw vine, *Rhodomyrtus*, *Ficus benjamina*, and other introduced plants and animals, especially below 1,500 feet elevation. These areas do not contain suitable habitat for listed species and should not be critical habitat.

Our Response: We agree that proposed unit D1 is not essential for the conservation of *Sesbania tomentosa*, and have excluded it from critical habitat designation. We agree that parts of proposed units D2 and E do not contain the physical and biological features essential to the conservation of *Brighamia insignis*, *Delissea rhytidosperra*, *Isodendron longifolium*, *Lipochaeta micrantha*, *Melicope haupuensis*, *Munroidendron racemosum*, *Myrsine linearifolia*, *Peucedanum sandwicense*, *Pteralyxia*

kauaiensis and *Schiedea nuttallii* and have modified these proposed units to exclude areas which are not essential to the conservation of these species.

(33) *Comment*: From the large scale map of the proposed area on Niihau provided in the Department of the Interior correspondence it is impossible to determine the exact boundaries of the proposed critical habitat. The commenter felt that creating this entity on Niihau is somewhat arbitrary.

Our Response: More detailed maps are available on request (see **ADDRESSES** section). We used the best available information to determine these boundaries, and based on new information made available during the comment period, *Cyperus trachysanthos* was removed from the low, wetland area of Niihau. More appropriate habitat to reach our recovery goals was available on other islands in areas that are less degraded and already being managed for conservation. However, *Brighamia insignis* needed more critical habitat than was available on Kauai, the only other island on which it is currently or historically known.

(34) *Comment*: It is unclear why the areas between Wahiawa Bog and Waialeale (unit N) or the central portion of unit J are necessary for either connectivity purposes or as needed unoccupied habitat. While these areas may be in a relatively good condition and may benefit other listed species (such as forest birds), it is not clear what additional value they contribute to listed plants. It is unclear why some critical habitat units (L, J, and N) need to be so large. The portion of this unit between Wahiawa Bog and Waialeale should be re-evaluated to clarify its value to target plant species. Portions of the wet forest in Unit J may potentially be deleted without compromising the recovery of target plant species. The landowner questioned the new information available for designating the entire Wainiha Valley as critical habitat. At minimum, the proposed critical habitat in Wainiha Valley should be restricted to the upper portion of the valley where occupied endangered plant habitat has been identified. This area is not an inconsiderable amount and may be sufficient to provide for any additional unoccupied habitat necessary for the conservation of the affected species.

Our Response: We agree, and have modified the units L, J, and N to exclude areas without primary constituent elements, including the lower reaches of Wainiha Valley. Other more intact areas are being designated on Kauai or proposed on other islands for those species as identified in the "Summary

of Changes from the Revised Proposed Rule" section.

(35) *Comment*: If Wainiha is excluded from critical habitat designation, the entire ecosystem would receive protection. The Nature Conservancy of Hawaii (TNCH) would work with partners from the National Tropical Botanical Garden and the Service concerning the area, including specific endangered species habitat protection. In addition, the landowner may enter into a perpetual conservation easement with TNCH and support species management on a long term basis. On the other hand, designating Wainiha as critical habitat will likely bring about actions detrimental to the preservation of the area and its endangered species. The landowner may react to critical habitat designation by closing up all access to the valleys for survey and data collection, conservation efforts, and management of endangered species.

Our response: We have evaluated the proposed critical habitat for the species in Wainiha Valley and have reduced the area based on the biological needs of the species and their recovery goals (see "Summary of Changes from the Revised Proposed Rule: Kauai J").

(36) *Comment*: No information is available, currently or historically, for the designation of critical habitat in the lower elevation areas of unit M. Because none of these species currently exist on the land, based on a survey by a botanical consultant in 1998, there is seemingly no reason to believe that excluding the area would lead to their extinction. The landowner is unaware of any other reliable scientific data on this area and is unaware of any attempts by the Service to enter the property to gather such data.

Our Response: We have revised the units for the species in unit M to eliminate much of the area in the lower elevations of unit M to exclude areas without primary constituent elements, based on new information received during the public comment period. In addition, other more intact areas are being designated or proposed on Kauai or on other islands for those species as identified in the "Summary of Changes from the Revised Proposed Rule" section.

(37) *Comment*: Some areas of Unit O are overgrown with Java plum, monkeypod or kukui and have no endangered plant species and should not be designated as critical habitat.

Our Response: We agree, and have modified the units to exclude areas without primary constituent elements. Other more intact areas are being designated or proposed on Kauai or on other islands for those species as

identified in the "Summary of Changes from the Revised Proposed Rule" section.

(38) *Comment*: There is no indication that the Navy parcels are, in fact, critical to the survival of these species. The military has numerous structures and activities that are within proposed critical habitat but are unsuitable for listed species. Without confirmation of an actual link between these specific areas and the survival of *Panicum niihauense* or *Wilkesia hobbdi*, designation of these areas as critical habitat would be imprudent. The following should be removed from the critical habitat designation: a 750 buffer area from the center of the runway; which is continually mowed, restrooms, pavilion, and unpaved parking area at Majors Bay Recreation Area; the antennae fields and associated ground radial systems, which are continually mowed; Amphibious Assault Training/RIMPAC Staging Area that disturb the vegetation and substrate; other structures such as buildings, roads, aqueducts, telecommunications equipment, telemetry antennae, radars, missile launch sites, and other manmade features; ground hazard areas established as safety zones around each missile launch site and launch pads; northernmost property line where "Smokey SAMs" are launched; other planned launch sites; Boresighting Tower, which is continually mowed; Borrow Pit site, which is mined; Composting Facility; and the Small Arms Firing Range and Construction Debris Stockpile, which will require the removal of vegetation and sand.

Our Response: We have had numerous discussions with the Navy regarding these areas, and as a result, have removed some sections of the units for these species, based on the lack of primary constituent elements. However, other areas could not be excluded because they do contain the primary constituent elements for these species, as described for each in the "Hawaiian plants—Constituent elements" section. These areas are necessary for the recovery of the species, and not enough other areas are available containing these primary constituent elements outside of the PMRF.

(39) *Comment*: The Navy has recently completed and begun implementing their Integrated Natural Resources Management Plan (INRMP) for the Pacific Missile Range Facility (PMRF). The Service has indicated an apparent willingness to reassess the critical habitat boundaries in light of this INRMP.

Our Response: We have reviewed the existing INRMP for PMRF. It is currently

not adequate to find that the designated areas in PMRF are no longer in need of special management considerations or protection and thus do not meet the definition of critical habitat because it does not include enough specific information on the conservation of *Panicum niihauese*. As far as the Service is aware, this INRMP has not yet been updated to address management needs of this species.

(40) *Comment*: Additional dry and mesic areas should be considered for critical habitat designations, including Olokeke Canyon.

Our Response: Olokeke Canyon was not included in any critical habitat designations because no data was available on the historic or current primary constituent elements or current species locations within those lands.

(41) *Comment*: One commenter would like to see Haena State Park removed from the critical habitat designation, because it is a high use visitor area, wall to wall historic and cultural landscape, and very degraded habitat with very few native plants. The cultural sites are currently being restored by the Hawaiian community.

Our Response: Information received during the public comment period informed us of the lack of primary constituent elements for the species in this area. Therefore, we revised the lines for the final designation to start around the 200-foot elevation line where a higher density of primary constituent elements exist for the species at issue.

Issue 3: Legal Issues

(42) *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 this 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. 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.

(43) *Comment*: Since concerns were raised from the hunting community and local government officials, a fair approach to resolving this issue may be through mediation, using the State's Judiciary Center for Alternative Dispute Resolution. To date, this will be the second recommendation made on this issue that still has not been taken under advisement.

Our Response: We have held several meetings with the hunting community and local government officials to promote information exchange and open dialogue. These meetings have served to alleviate some of the controversy and contention that have surrounded the issue of critical habitat designation on Kauai and other Hawaiian Islands. However, this is a rulemaking process governed by the ESA and the Administrative Procedures Act and not easily resolved thru mediation. We have tried our best to have an open process with an opportunity for all interested parties to participate, while complying with our statutory responsibilities and court-ordered deadlines.

(44) *Comment*: Any activity that may degrade critical habitat, including activities that are not subject to section 7 consultation, could be seen as an "injury" to (and therefore, under State law, a "taking" of) an endangered plant species under the State of Hawaii's endangered species law (Hawaii Revised Statutes (HRS) Chapter 195D). It is important that this receive due consideration in evaluating the proposed critical habitat designations (for example, in completing the economic analysis), and that the Service explain to what extent it has considered the potential interplay between the Federal Endangered Species Act and Hawaii endangered species laws.

Our Response: Possible costs resulting from interplay of the Federal Endangered Species Act and Hawaii State law were discussed in the economic analysis under indirect costs (e.g., possible conservation management

mandate for the private landowner and reduction in game mammal populations). The economic analysis considers 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 economic analysis examines any indirect costs of critical habitat designation, such as where critical habitat triggers the applicability of a State or local statute. 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 co-extensively occur because of critical habitat designations. There are no take prohibitions associated with critical habitat.

(45) *Comment*: One commenter stated that the Service should do a better job of communicating what critical habitat does and does not do, including a review of recent "Federal monies and Federal approvals," and which of those programs might even remotely be affected by designations of critical habitat.

Our Response: We have made a concerted effort to provide the public with information on what critical habitat does and does not do, through a series of public workshops and meetings, correspondence, news releases, and publications. A detailed review of Federal activities that may be affected by the critical habitat designations on Kauai and Niihau may be found in the economic analysis section of this rule. The public could also refer to the Service's National website <http://www.fws.gov>.

Issue 4: Section 7 Consultation

(46) *Comment*: The draft economic analysis states that if a landowner needs a Federal permit or receives Federal funding for a specific activity, the Federal agency issuing the permit or dispersing the funds would consult with the Service to determine how the action may affect the designated critical habitat. The commenter questioned what is meant by the term "consult." The nature of the consultation could result in control of whether the Federal government conducts its proposed action on those lands or not, thereby controlling the land to the extent that the private landowner could or could not do business with the Federal government. What would consultation result in when a proposed Federal action is being compared to the activities not affected by critical habitat

designation, such as, grazing, farming, hunting or recreational use?

Our Response: The term “consult” refers to consultation between the Service and other Federal agencies under the provisions of section 7 of the Act. Under this provision of the Act all Federal agencies must consult with the Service to insure that any action that they authorize, fund, or carry out is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of critical habitat. If the Service finds that the proposed actions are likely to jeopardize the continued existence of an endangered or threatened species or result in destruction or adverse modification of critical habitat, we suggest reasonable and prudent alternatives that would allow the Federal agency to implement their proposed action without such adverse consequences. Every consultation is unique and it is impossible to comment on what the results of a future consultation will be without details on the proposed activity and the status of the species and its critical habitat at the time of the consultation.

Issue 5: Mapping and PCEs

(47) *Comment:* Although the text in the proposed rule appears to indicate that unit F in Lawai Valley is restricted to land owned by the National Tropical Botanical Garden, a map provided by the Service shows some overlap between this unit and McBryde land above Lawai Stream, near Luawai Reservoir. The Service should clarify whether unit F is intended to include portions of the McBryde land, as suggested by the map, or if any overlap is purely due to mapping inaccuracies. If the proposal is intended to include McBryde land in this area, the Service should consider conducting a biological survey of the area to confirm whether the area in question actually contain any individuals of *Schiedea spergulina* var. *leipoda* and/or whether this area is essential.

Our Response: The majority of the unit is within the lands owned by the National Tropical Botanical Garden. However, some of the McBryde land does fall within the unit. Efforts were made to exclude lands currently used for cultivation. This unit is important to the conservation of *Schiedea spergulina* var. *leipoda* because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are important for this

species include, but are not limited to, bare rock outcrops or sparsely vegetated portions of rocky cliff faces or cliff bases in diverse lowland dry to mesic forests. Although we do not feel 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.

(48) *Comment:* The draft economic analysis dismisses concerns about impacts on the use of structures and features already placed in areas to be designated as critical habitat. Although manmade features and structures are excluded from critical habitat because they lack the primary constituent elements, greater precision in pinning down these “unmapped holes” is needed to avoid a chilling effect on legitimate uses that necessarily approach a fuzzy boundary line.

Our Response: Existing features and structures within critical habitat areas, 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 equipment towers and associated structures and equipment; electrical power transmission lines and distribution, and communication facilities and regularly maintained associated rights-of-way and access ways; radars, 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 and other manmade features do not contain, and are not likely to develop, primary constituent elements, and are specifically excluded from designation under this rule. Therefore, unless a Federal action related to such features or structures indirectly affects nearby habitat containing the primary constituent elements, operation and maintenance of such features or structures generally would not be impacted by the designation of critical habitat. We have attempted to exclude manmade structures using aerial photos, our own field experience on Kauai and that of other expert field botanists from DOFAW and the University of Hawaii at Manoa. However, we were not always able to successfully exclude these structures from the critical habitat maps

because the resolution of our imagery does not allow us to locate small structures. Higher resolution imagery is currently unavailable on a State-wide basis.

Issue 6: Effects of Designation

(49) *Comment:* One commenter stated that the designation of critical habitat would almost certainly make its private endangered species reserve the target of a government takeover attempt.

Our Response: Section 3(5) of the Act defines critical habitat as those specific areas which contain physical or biological features essential to the conservation of the species and which may require special management considerations or protection (16 U.S.C. 1532(5)). 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).

To a property owner, the designation of critical habitat becomes important when viewed in the context of section 7 of the Act, which requires all Federal agencies to ensure, in consultation with the Service, that any action authorized, funded, or carried out by the agency does not result in the destruction or adverse modification of designated critical habitat. If, after consultation, our biological opinion concludes that a proposed action is likely to result in the destruction or adverse modification of critical habitat, we are required to suggest reasonable and prudent alternatives to the action which would avoid the destruction or adverse modification of the critical habitat (16 U.S.C. 1536(b)(3)(A)). If we cannot suggest acceptable reasonable and prudent alternatives, the agency (or the applicant) may apply for an exemption from the Endangered Species Committee under section 7(e)–(p) of the Act.

The mere promulgation of a regulation, like the enactment of a statute, does not take private property unless the regulation on its face denies the property owners all economically beneficial or productive use of their land (*Agins v. City of Tiburon*, 447 U.S. 255, 260–263 (1980); *Hodel v. Virginia Surface Mining and Reclamation Ass’n*, 452 U.S. 264, 195 (1981); *Lucas v. South Carolina Coastal Council*, 505 U.S. 1003, 1014 (1992)). The designation of

critical habitat alone does not deny anyone economically viable use of their property. The Act does not automatically restrict all uses of critical habitat, but only imposes restrictions under section 7(a)(2) on Federal agency actions that may result in destruction or adverse modification of designated critical habitat. Furthermore, as discussed above, if a biological opinion concludes that a proposed action is likely to result in destruction or modification of critical habitat, we are required to suggest reasonable and prudent alternatives.

We are aware of relatively few activities in the proposed critical habitat areas for these 83 plants that have Federal involvement, and thus, would require consultation or reinitiation of already completed consultations for on-going projects. We are not aware of any commercial activities on the Federal lands included in these proposed critical habitat designations.

(50) *Comment:* If endangered species are dying through no fault of the landowner, then the landowner should not be penalized with onerous and costly regulations. What incentives are being provided private landowners to act on behalf of listed plants?

Our Response: Critical habitat designation does not impose additional regulatory requirements upon non-Federal landowners unless they are receiving funding or authorization from a Federal agency for a proposed action that is likely to destroy or adversely modify critical habitat. Many threatened and endangered species occur on private lands and the Service recognizes the importance of conservation actions by private landowners. Cooperation from private landowners is an important element of our conservation efforts, and we have had considerable success in developing partnerships with large and small landowners, government agencies, and non-governmental organizations for conservation activities on Kauai, in the State of Hawaii, and throughout the nation.

The Service administers several programs aimed at providing incentives for landowners to conserve endangered and threatened species on their lands, one of which is the Endangered Species Landowner Incentive Program, which was first funded by Congress in fiscal year 1999. Under this program, the Service provides technical assistance and funding to landowners for carrying out conservation actions on their lands. In the first year alone, 145 proposals totaling \$21.1 million competed for \$5 million in grant money. Additional information on landowner incentive programs administered by the Service

may be found on our website <http://endangered.fws.gov/landowner/index.html>.

(51) *Comment:* The Service has tried to reassure the public that the wholesale dedication of land as critical habitat will not result in restrictions of public access and that most land use proposals will be approved. One commenter said that this is probably not true, based on what has happened in other parts of the country.

Our Response: Undoubtedly, human activities have had a negative impact to many species in Hawaii. However, numerous threatened and endangered species are currently on the road to recovery through the direct intervention of humans. These include marine and terrestrial vertebrates, plants, and invertebrates. The designation of an area as critical habitat does not in itself restrict public access. The regulatory effect of critical habitat designation is limited to requiring consultation under section 7 of the Act for Federal actions. Since few, if any, Federal actions affect public access to the State and private lands designated as critical habitat for these plants, it is unlikely that public access to these areas will be altered.

(52) *Comment:* By setting aside so many acres of land with no guarantee that the plan will work it will rob the Hawaiian people of their culture and lifestyle. Critical habitat designation should accommodate the traditional cultural gathering rights of Native Hawaiians as reflected in Article XII of the State Constitution and upheld by the Hawaii Supreme Court in PASH and Ka Paakai o Ka Aina decisions. Native Hawaiian issues should be handled by the native Hawaiian people. The Service should make a plan to save plants where the Hawaiian people would have a say.

Our Response: Critical habitat designation does not affect activities, including human access, on State or private lands unless some sort of Federal permit, license, or funding is involved and the activities may affect endangered or threatened 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 such destruction or adverse modification, we will suggest reasonable or prudent alternatives.

Activities of the State or private landowner or individual, such as

farming, grazing, logging, and gathering, generally are not affected by a critical habitat designation, even if the property is within the geographical boundaries of the critical habitat. A critical habitat designation has no regulatory effect on access to State or private lands. 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.

The Service actively seeks input and participation from the public in development and implementation of recovery plans for endangered and threatened species and believes that it is only through such active participation by the public that we will be able to recover these plants.

(53) *Comment:* The critical habitat initiative is generating an unwelcome degree of rift between the State Department of Land and Natural Resources (DLNR) and the Service, and may erode public support for needed recovery efforts. The Service should withdraw their plans for critical habitat designation on Kauai, and instead, work with existing agencies on their current efforts at conservation and preservation. The testimony presented by DLNR at the February 2001 hearing recommends suggestions for working together and cites specific methods for its implementation. They deserve the Service's utmost attention.

Our Response: We agree that the Department of Land and Natural Resources, Division of Forestry and Wildlife (DOFAW) comments and suggestions should be given the utmost attention. During the public comment periods for the November 7, 2000, proposal for plants from Kauai and Niihau, we received written comments and a map showing the DOFAW's vegetation classes and recommended critical habitat units. We evaluated DOFAW's comments on a species by species basis and incorporated their information into the revised proposal published on January 28, 2002. DOFAW recommended deletion of some of the proposed critical habitat units as they do not believe these areas are suitable for the recovery of some species because they would not be able to manage these areas with their limited staff and funding. Because the basis for identifying areas by DOFAW was made on the manageability of the area, their mapping of habitat is distinct from the regulatory designation of critical habitat as defined by the Act.

Following publication of the revised proposal in January 2002, we met with DOFAW on numerous occasions and conducted several site assessment surveys to evaluate habitat that meets the legal requirements of the Act and takes into account the on-the-ground knowledge of DOFAW's biologists and land managers. As a result of the assessment surveys and information provided to us by Kauai DOFAW staff we excluded non-essential areas that did not contain primary constituent elements. In addition, we received important information from Kauai DOFAW staff that enabled us to refine the final critical habitat designations to meet the conservation needs of the species.

Issue 7: Policy and Regulations

(54) *Comment:* Prudence cannot be determined without an analysis of the economic impacts of critical habitat.

Our Response: The Service makes an initial determination on the prudence of designating critical habitat 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 the Service finds that economic and other impacts outweigh the benefit of designating critical habitat in a given area, that area will be excluded from critical habitat designation unless such exclusion will result in the extinction of the species concerned.

(55) *Comment:* The prudence of critical habitat designation is a final conclusion based on weighing all relevant factors, including economic factors. While the Service promised to complete its economic impact analysis before it promulgates its final determination of critical habitat, it risks putting the decision before the analysis. The prior determination that critical habitat is prudent and therefore required, is treated as a given, even though it ignored economic factors.

Our Response: An economic analysis of the impact of critical habitat cannot be done without knowing the location of the critical habitat. This fact is easily realized by considering the difference of proposed critical habitat on land zoned for protective conservation versus land

zoned for urban development. These types of zoning issues as well as other issues will greatly affect any economic analysis of critical habitat and cannot be taken into consideration until a proposal of critical habitat is put forth. The proposed prudence finding is not a final prudence finding since it has not considered the economic issues. The fact that the proposed critical habitat is published in a proposed rule emphasizes that no final decision has been made on location or extent of critical habitat. The final designation of critical habitat occurs after public comments have been received and the economic analysis on the proposed critical habitat has been completed. The effects of the public comments and the economic analysis are then reflected in the final rulemaking.

(56) *Comment:* The proposed rule unfairly transfers the Service's obligations to determine "prudent and determinable" areas for designation as critical habitat from itself to the owners of the designated lands. This action could potentially violate Section 3(5)(c) of the ESA, which specifically provides that "except in those circumstances determined by the Secretary, critical habitat shall not include the entire geographical area which can be occupied by the threatened or endangered species."

Our Response: All areas designated as critical habitat are determined by the Service, after taking into account the economic analyses and public comments. As established by the Congress of the United States, the Secretary of the Interior or the Secretary of Commerce has the responsibility for designation of critical habitat areas. This responsibility has been delegated to the U.S. Fish and Wildlife Service for listed fish, wildlife and plants and cannot be transferred to any other party. Proposing areas for designation as critical habitat does not transfer any of the designation responsibilities of the Service. As part of the Service's designation process, the entire geographic area that could be occupied by the threatened or endangered species is *never* put forth as proposed or final critical habitat, unless circumstances unique to the species require such a designation and only after approval by the Secretary of the Interior (or the Secretary of Commerce).

Issue 8: Economic Issues

(57) *Comment:* Some reviewers commented that the DEA did not address or did not adequately consider a variety of costs and benefits that they believe could occur due to the implementation of section 7 for the plants.

Our Response: Many of these possible costs were, in fact, 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 impossible for them to occur. In still other cases, the concerns no longer have substance given the Service's modifications to the proposed critical habitat.

(58) *Comment:* Several commenters stated the following: The Service did not adequately address the takings of private property as a result of designating critical habitat for endangered plants on Kauai. 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.

Our Response: The possible costs associated with redistricting land proposed for critical habitat designation were discussed in the DEA under indirect costs. The final rule removes most of the land in the Agricultural and Urban Districts from the critical habitat designation. Redistricting the remaining privately owned parcels to the Conservation District could result in a small probability of: (1) Approximately \$178,500 in lost property values; (2) \$3,570 in an annual loss of economic activity associated with ranching; and (3) \$500 in increased property taxes.

(59) *Comment:* One commenter said that estimated management costs needed to recover a species should be part of an economic analysis associated with critical habitat designation. Another commenter said that management costs for the recovery of listed species are not appropriate costs to assign to critical habitat designation.

Our Response: 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.d. of the DEA and section 4.c. of the Addendum does discuss landowners' concerns that the interplay between the state's prohibition on take and critical habitat could result in a potential mandate for conservation management pursuant to litigation and the resulting costs for the proposed designation on Kauai. As noted in Section 4.c. of the Addendum, the costs of conservation management for critical habitat as modified could reach \$1.8 million per year. However, the likelihood of this result is estimated to be low and such costs would not

necessarily be assigned to critical habitat.

(60) *Comment:* Several commenters stated the following: The Service fails to adequately analyze the economic impact to small entities under the Regulatory Flexibility Act, and the Small Business Regulatory Enforcement Fairness Act. Given Kaua'i's small population, a large proportion of firms in the agricultural sector may well be affected and could suffer severe impact. In addition, the prospect of indirect costs mounting into the tens of millions of dollars on a small island requires the Service to reconsider its blithe assumption that there will be no significant impact on small businesses. Having mentioned huge potential losses to landowners and the county economy, the DEA fails to carefully consider the sum of the many "indirect" effects of critical habitat designation, ignoring all but direct costs of consultation.

Our Response: Section 5 of the addendum presents a regulatory flexibility analysis that is consistent with the RFA/SBREFA. Federal courts and Congress have indicated that an RFA/SBREFA analysis should be limited to the impacts to entities subject to the requirements of the regulation (Service, 2002). As such, entities not directly regulated by the listing or critical habitat designation are not considered in the RFA/SBREFA analysis. Based on the analysis, there are no small entities that may be impacted by the implementation of the Act's section 7 provisions for the plants on Kauai. Therefore, the plants' critical habitat designation, as modified, will not have a significant economic impact on a substantial number of small entities.

(61) *Comment:* Several commenters stated the following: 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, this fails 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 also extend to State agencies requiring Federal funds or approvals.

Our Response: The analysis in the DEA, as revised by the Addendum, is based on a review of all projects, activities, and land uses that may be directly affected by the implementation of section 7 for the listed plants. The DEA and the Addendum present any reasonably foreseeable Federal

involvement (Federal permit, license, or other authorization, or Federal funding) for these projects, activities, and land uses. These results of this analysis are presented in Table ES-1 in the DEA and Table Add-2 in the Addendum.

(62) *Comment:* Several commenters stated the following: The impact of the proposed designations under State law is potentially more extensive than under Federal law since the Act contains at least general criteria for determining when alteration of critical habitat constitutes "destruction or adverse modification." The lack of analogous provisions under State law lends itself to a much broader interpretation of what activities might be considered injurious to the species (and therefore prohibited). One commenter asked if, to the extent that the Service has considered the potential interplay between the Act and State statutes, whether the Service is aware of any circumstances where similar issues have been raised under other State conservation statutes when critical habitat was designated. Another commenter noted, however, that because Hawaii's land use laws are uniquely onerous, precedent from other states is of little value. The current wave of proposals to designate critical habitat are the first time that the Act has been applied to significant areas of private land in Hawaii. Consequently, even prior experience in Hawaii is of little relevance.

Our Response: Possible costs resulting from interplay of Federal Endangered Species Act and Hawaii State law are already discussed in the DEA and Addendum under indirect costs (e.g., possible conservation management mandate for the private landowner and reduction in game mammals population). The lack of experience with critical habitat on private land in Hawaii is reflected in the uncertainty regarding the probabilities that certain indirect costs will occur.

(63) *Comment:* Several commenters stated the following: The DEA fails to consider economic impacts of listing and critical habitat that result through interaction with State law, specifically Hawaii's Endangered Species Act. *New Mexico Cattlegrowers 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. However, since 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).

Our Response: The DEA and 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, they examine any indirect costs of critical habitat designation such as where critical habitat triggers the applicability of a State or local statute. 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 co-extensively occur because of critical habitat designations. There are no take prohibitions associated with critical habitat.

(64) *Comment:* Several commenters stated the following: The DEA fails to consider economic impacts of critical habitat that result through interaction with State law, specifically Hawaii's Land Use Law. Critical habitat could result in downzoning under State law. 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 suits. Areas for endangered species are placed in the protected subzone with the most severe restrictions. While existing uses can be grandfathered in, downzoning will prevent landowners from being able to shift uses in the future, reduce market value, 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 as "slight to small."

Our Response: About 370 acres of privately owned agricultural lands and 12 acres of privately owned urban lands are included in the final designation. Most of the agricultural land is on Niihau and all of the urban land is on steep ocean cliffs. The potential economic costs discussed in the DEA of over \$10 million associated with urban Land in Unit D1 are no longer anticipated because Unit D1 has been removed from the final critical habitat designation for biological reasons. Reduction in land values due to redistricting land from Agricultural or

Urban District to Conservation District could result in a loss of \$178,500 in property values on Niihau. The loss of the economic activity from ranching and the increase in property taxes is estimated at \$4,070 per year. Under this scenario, even if a landowner has no plans to sell the land, the loss in land value could reduce potential mortgage financing.

(65) *Comment:* One commenter stated the following: The State currently leases some of its lands for agriculture or ranching uses. There is uncertainty whether any endangered plant species exists on these lands, which have historically been used for agricultural and ranching purposes, and have been subject to grazing and cultivation activities. If such species do exist, State law would completely prohibit or substantially restrict the continued use of these lands for agriculture or ranching purposes and would clearly have an adverse impact on the operations of the lessees and lease revenues. The DEA fails to establish that the benefits of including specific leased parcels outweigh the costs.

Our Response: Approximately 37 acres of State owned land are included in critical habitat Units H1 and M, as modified in the final rule. The 33 acres in Unit H1 comprise a sliver of land that is makai (toward the ocean) of the existing road in the northern portion of the unit and does not include any fields or grazing land. The State does not have any agricultural leases for the four acres of Agricultural land in Unit M. As such, the designation of critical habitat is not anticipated to have adverse effects on agricultural activities on State land.

(66) *Comment:* Several commenters stated the following: The DEA fails to consider economic impacts of critical habitat that result through interaction with State law, specifically Hawaii's 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. However, the DEA does not acknowledge that any impact on endangered species habitat will be deemed to be "significant." In addition, multiple commenters stated that the DEA fails to evaluate the practical effect critical habitat designation will have on development. Special Management Area permits administered by Kauai 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.

Several commenters also stated the following: 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, as evidenced by the Service's petition to 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. That the Service does not address these activities in the DEA is a fundamental error of the analysis.

Our Response: Chapter VI, Section 4.f.(2) of the DEA discusses State and county environmental review, with and emphasis on Hawaii's Environmental Impact Statement Law. This section indicates that if a project is required to do an Environmental Assessment (EA) and is located in critical habitat, a more expensive EIS may have to be prepared. The estimated increase in costs to prepare an EIS is \$25,000 to \$75,000 per project. There is one project that may require an EA and is located in critical habitat, as modified. As such, the additional environmental review cost potentially attributable to critical habitat is \$25,000 to \$75,000.

However, there are no planned development projects that will require State and county development approvals and are located in critical habitat, as modified in this final rule. The following factors make future development projects in the proposed critical habitat highly unlikely: (1) As modified, 99 percent of the proposed critical habitat is in Conservation District where development is severely limited; (2) almost all of the remaining agricultural land is on Niihau in an area not subject to development pressure; and (3) all of the land in the Urban District is on steep ocean cliffs that cannot support development. Thus, the probability that the Service will intervene in State and county development approvals is regarded as negligible because there is no development planned and almost no development potential in critical habitat.

(67) *Comment:* Several commenters stated the following: 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 that "adequate provision shall be made for protection of fish and wildlife. HRS 174C-71 instructs the Commission of Water Resource Management to establish an instream use protection program to protect fish and wildlife. Since landowners may depend on water pumped from other watersheds, these effects can be far-reaching. It is impossible to tell from the descriptions in the proposal whether any water diversions will have to be reduced as a result of listing and critical habitat designation. It is unfair to dismiss costly but vital sources of energy and inexpensive irrigation water while maintaining the highest level of effort to protect primary constituent element for species that do not physically reside in the area but may somehow be transported. 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. 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. Water sources and irrigation ditches that are part of the former Kekaha irrigation system for the former Kekaha Sugar Plantation should be removed from designation. At minimum, portions of specific parcels that include water sources or water systems should be removed.

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, including the Kekaha irrigation system, 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. (See comment 7.m. of the Economic Analysis for a discussion of the impacts of the proposed designation on potential new water diversions.)

(68) *Comment:* Several commenters stated the following: The irrigation system stemming from the North Fork diversion of the Wailua River and the hydropower plant located in Wainiha Valley are necessary for the continued viability and possible expansion of agricultural activities on Kauai.

Continued operation of the systems require registration permits from the State and, depending on the nature of the maintenance, may require Army Corps of Engineers (COE) permits. These uses should not be burdened with the threat of potential Federal or civil action prohibiting or delaying their continued or expanded use. Furthermore, any additional requirement brought about by a critical habitat designation would be borne by the system's end users. Similarly, restoration of the taro fields in Haena State Park would require a COE permit. The designation of this area as critical habitat would make it unlikely that this permit would be approved, thus frustrating the efforts and development of the park. Additional analysis of costs associated with hydropower development is warranted. Such analysis would indicate that agricultural lands and hydropower development should be excluded from designation of critical habitat because benefits of exclusion would far outweigh the benefits of designation and the exclusion would not result in the extinction of the species.

Our Response: The irrigation system stemming from the North Fork diversion of the Wailua River, the diversion and hydropower plant located in Wainiha Valley, the taro fields in Haena State Park, and all areas downstream from these water systems/improvements have been removed from the critical habitat as modified in this final rule. In addition, as noted in responses to other comments, none of the listed plants are aquatic and therefore would not cause a reduction in water diversion. Thus, no costs are expected from continued operation of these water systems.

Chapter VI, section 3.i. of the DEA discusses the potential for additional hydropower development in the areas proposed as critical habitat. Since the publication of the DEA, information regarding a hydropower diversion and powerhouse in the upper Wainiha Valley was made available. This hydropower plant was proposed in the 1980's, but due to the landowner's capital limitations at the time, it was not constructed. There are no current plans to continue to investigate the feasibility of the project, but the potential for future development adds to the land value of the Upper Wainiha Valley. However, the area planned for the diversion, powerhouse, and other project elements are no longer included in critical habitat as modified. As such, no costs associated with future hydropower development potential are anticipated.

(69) *Comment:* One commenter stated the following: In discussing possible future hydropower facilities, the DEA appears to contradict itself by saying that in May 2001 a company filed an application with the Federal Energy Regulation Commission for a preliminary permit and then saying it is "highly unlikely" that any additional hydro plants will be built. If critical habitat designations make it all but impossible to build a new hydropower facility, which seems to be the implication of the DEA, then the designations contradict the State and national policies of promoting energy independence.

Our Response: Chapter VI, Section 3.i. of the DEA does mention that in May 2001, a company filed an application with the Federal Energy Regulatory Commission (FERC) to build a dam on the lower Wailua River and that the area affected by this project is outside of critical habitat. The DEA also states that "it is highly unlikely that additional plants will be built in the next 10 years in areas that could impact the proposed critical habitat." This statement is supported by studies performed by the State Department of Business, Economic Development, and Tourism (DBEDT) of the areas in critical habitat, and current plans of those who own land in critical habitat. In addition, the planned generating capacity on Kauai is sufficient to supply projected demand over the 10-year period of the analysis. Since the proposed critical habitat does not cover the entire island of Kauai, these two statements are not contradictory.

Furthermore, development of a new hydropower plant would still be possible even if the hydropower plant was located upstream or within critical habitat. If the project had Federal involvement, and the Federal action agency determined the project may affect critical habitat or listed species, the Federal action agency would enter into section 7 consultation with the Service. The section 7 consultation process is described in detail in Chapter III of the DEA.

(70) *Comment:* One commenter stated the following: On Maui, there is an administrative contested case proceeding pending before the Board of Land and Natural Resources that involves the diversion of millions of gallons of water. Any diversion in or upstream of critical habitat will be challenged by people who oppose all diversions on principle. They will contend that diverting water from endangered plants risk driving them to extinction. Opponents of diversions could use the critical habitat

designations to invent a colorable argument sufficient to delay and confuse water use decisions.

Our Response: Chapter VI, section 3.j.(2). of the DEA states that it is highly unlikely that a new ditch system or major expansion to an existing one (including new diversions) would be proposed or approved in the proposed critical habitat. This assessment is made due to the existing protections provided by the baseline environmental regulations (described in Chapter IV of the DEA), the projected demand for additional diversions for irrigation above and beyond the existing supply, and current environmental concerns, as well as likely public opposition to stream diversions.

None of the plants for which critical habitat is designated on Kauai or Niihau in this final rule are aquatic. These plants rely on rainwater that percolates down through the substratum and is absorbed by the plant's roots. Thus, local rainfall and localized surface runoff are the critical factors that affect the habitat of the listed plants. In addition, water infrastructure, including irrigation systems, are considered manmade features 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. (See comment 7.m. of the Economic Analysis for a discussion of the impacts of the proposed designation on potential new water diversions.)

We are unable to find documentation of extinction of Hawaiian plants due to water diversions and are unable to comment on the speculation that people who oppose all water diversions on principle will challenge any future or current diversions by contending that diverting water from endangered plants risks driving them to extinction.

(71) *Comment:* Two commenters stated the following: The estimated total costs of designating critical habitat are deceptively low because they exclude costs that "are difficult to estimate." However, the costs of conservation management are quantifiable and examples of cost per acre are available from watershed management projects around the State. There is no reason why these costs should be ignored in the DEA. If included, these costs will certainly outweigh the benefits of designation. The DEA also underestimates the economic costs because they are limited to what is

likely to occur within 10 years even though critical habitat designation is permanent and not automatically revised if there is new evidence of the benefits of non-designation, or if the species is delisted.

Our Response: As noted above, the illustrative cost of conservation management of the entire critical habitat as modified is \$1.8 million per year. In addition, as discussed in the economic analysis, while there is no existing obligation to proactively manage lands in critical habitat to control threats, there is an undetermined probability that a State or Federal court could mandate conservation management.

A listed species is delisted when it is recovered or has gone extinct. Recovery is defined as no longer needing the protections provided by the Endangered Species Act, including critical habitat. As such, when a species is delisted, its critical habitat would also be "undesigned." Furthermore, as indicated by the DEA, many landowners and managers do not have specific plans for projects beyond 10 years, and forecasts of future economic activity are based on current socio-economic trends and the current level of technology, both of which are likely to change over the long term. However, information available in documents with planning horizons that are longer than 10 years such as the Kauai Planning Department's Kauai General Plan (2002), and the State Department of Transportation Kauai Long Range Land Transportation Plan (1997) are considered in the preparation of the DEA and the Addendum.

(72) *Comment:* One commenter stated the following: The conclusion under E.O. 12866 that the rule will not have an annual economic effect of \$100 million or more, or adversely affect in a material way any sector of the economy or State or local governments or communities, is flawed because it does not consider the major adverse impacts from secondary effects.

Our Response: For the reasons explained in the economic analysis, the rule is not expected to have an annual economic effect of \$100 million or more. As indicated in Table Add-2, the annualized direct costs of the implementation of section 7 for the listed plants ranges from approximately \$17,800 to \$112,500. While the probability that many of the indirect effects will occur is low or unknown, the total worst case scenario for the indirect costs of critical habitat, as modified, includes (1) \$513,000 in direct and indirect annual sales from the loss of economic activity associated with hunting (however, the decrease in

expenditures by the displaced hunters would probably be spent on other recreational activities, goods and services, so this figure is likely to overstate the economic costs); (2) \$149,000 per year in the loss of hunter benefits (however, as above, some of this loss will be offset by benefits derived from alternative recreational activity); (3) \$1.8 million in annual conservation management costs (some of which may be in the form of new Federal funds to Hawaii and thus represent an increase the regional economy instead of a loss); (4) approximately \$178,500 in lost property values; (5) \$3,570 in an annual loss of economic activity associated with ranching; (6) \$500 in increased property taxes; (7) \$25,000 to \$75,000 in the additional cost to prepare an EIS; and (8) \$53,000 to \$169,000 in the costs to investigate the implications of critical habitat. Annualized, these indirect costs amount to \$2.49 million to \$2.51 million per year. The sum of the direct and indirect costs, annually, ranges from \$2.51 million to \$2.62 million, significantly less than the \$100 million level of significance.

(73) *Comment:* Several commenters stated the following: Critical habitat designation could indirectly result in limitations or special management requirements, such as fencing or control of invasive species, being established on private lands. These requirements could result in considerable cost to both the State and private landowners. The DEA estimates that the Palila case may be interpreted to mandate private conservation and could cost Kauai landowners \$3 million or more per year. These costs should be considered. Where such costs are likely to outweigh the benefits, the Service should determine that critical habitat designation is not prudent. At 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.

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 of the following situations exist: (i) A species is threatened by taking or other human activity and identification of critical habitat would increase the degree of threat; or (ii) 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, the DEA and the Addendum discuss the potential mandate for conservation management pursuant to litigation and the resulting costs for the proposed designation on Kauai. The cost of conservation management for the critical habitat as modified could be approximately \$1.8 million per year. However, there is an undetermined probability that this impact will occur.

(74) *Comment:* Several commenters stated the following: The cost of potential citizen suits preventing certain activities or requiring some sort of management in critical habitat was not discussed in the DEA. Litigation regarding land management requirements is not only foreseeable, but likely. The proposals will give the government and the environmental groups a legal excuse to attack and severely damage anyone who grows endangered Hawaiian plants, and also anyone whose land is listed as critical habitat. Human freedom and constitutional principles are far more important than biologically incompetent plants. Critical habitat designation will bring unnecessary and costly litigation, thus creating an economic disaster that would severely challenge one private landowner's economic viability. These official listings will also give the government and the environmental groups a legal excuse to meddle destructively in the affairs of Niihau.

Our Response: As discussed in the DEA and in 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, the probability that a lawsuit will be filled, 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.

(75) *Comment:* Several commenters stated the following: A strip of Grove Farm-owned land along the coastline from the Poipu Bay Golf Course to Kaweliko Point is being proposed for critical habitat. Although much of this land is within the Conservation District and development, if any, is expected to be minimal, critical habitat designations may affect current activities that exist in this area, as well as possible future activities, such as, hiking, kayaking or horseback riding. The Poipu Mahaulepu property also has future potential as a quality resort development, with potential construction valued in the hundreds of millions of dollars and employment and housing for over a thousand residents. The U.S. Navy currently has 14 beach cottages and an officers beach facility within its Pacific Missile Range Facility (PMRF). Funding has been appropriated to add six cottages and future plans provide for additional cottages to follow. Completed documents also identify construction plans for other new facilities and structures on PMRF. The economic analysis does not adequately consider such future costs.

Our Response: Activities such as hiking, kayaking, and horseback riding are not identified as threats to critical habitat in the proposed rule. As such, any additional environmental review or modification to these activities directly or indirectly attributable to critical habitat is anticipated to be negligible. The planned site for the Poipu Mahaulepu resort and the 14 beach cottages at PMRF are not included in critical habitat as modified. The potential costs associated with other planned construction at PMRF are discussed in Chapter VI, section 3.m. of the DEA and in section 3.b. of the Addendum.

(76) *Comment:* Several commenters stated the following: Portions of the proposed critical habitat designations are within the Conservation District. Although there are no intense activities occurring on these lands, roadway and water systems traverse some of these lands. Critical habitat designations may affect operations and maintenance of these systems as well as any future change in use of the lands.

Our Response: As mentioned in the proposed rule and in Chapter I of the DEA, existing manmade features and structures do not contain, and are not likely to develop, primary constituent elements essential for the conservation of the listed species. These features and structures are considered "unmapped

holes" that are found within the boundaries of critical habitat units but are not considered by the Service to be part of critical habitat. As such, there are unlikely to be any direct section 7 related costs to the operation and maintenance (O&M) of existing features and structures.

The inclusion of these features and structures in the critical habitat boundaries could indirectly affect the activities associated with the existing features due to an increase in State and county environmental review. However, any additional delays or modifications as a result of the increased State and county review are anticipated to be negligible because manmade features and structures do not contain the primary constituent elements for the listed plants.

The DEA and the Addendum present all of the reasonably foreseeable projects, land uses, and activities that could occur within critical habitat over the next ten years. While there may be some unknown future change in the use of the land in the Conservation District in critical habitat, there is insufficient information to assess the potential indirect or direct effects critical habitat will have on the land use. However, any impact attributable to critical habitat is anticipated to be minor due to the existing protections provided by Conservation District and other baseline regulations discussed in Chapter IV of the DEA.

(77) *Comment:* Several commenters stated the following: Kauai's economy is far from robust and serious consideration must be given to the economic consequences of designating critical habitat. The total designation of 99,206 acres on Kauai and 697 acres on Niihau encompass approximately one-fourth of the total land area of Kauai County and is of grave concern.

Our Response: Critical habitat, as modified, includes roughly 15 percent of the island of Kauai and less than one percent of the island of Niihau. The economic costs to the economy of Kauai County (which includes both Kauai and Niihau) are expected to be minimal because (1) as modified, 99 percent of the proposed critical habitat is in Conservation District where development and other economic activity is severely limited; (2) almost all of the remaining agricultural land is on Niihau in an area not subject to development pressure; and (3) all of the land in the Urban District is on steep ocean cliffs that cannot support development.

(78) *Comment:* Several commenters stated the following: All Hawaiian plant recovery plans call for fencing to keep

feral animals away from the plants. Yet the Service has stated that the 99,000 acres being designated as critical habitat on Kauai will have no impact on the hunters. Clarification of this statement is needed. Critical habitat designation will greatly impact the public hunting program and deprive hunters access to lands they have used for generations for recreation as well as food supplement for their families. This loss is of further significance, given Kauai's hard-pressed economy and the recent closures of Amfac and Kekaha Sugar plantations. The State could also lose much needed revenues to continue its game and area management services as sales of hunting licenses would decrease. This, in turn, would result in the overgrowth of non-endangered plant species that will eventually overrun the protected endangered species population. Also, limitations on game hunting in areas of critical habitat may lead to an increase in the numbers of wild pigs and goats, which would feed on the endangered plant species.

Our Response: Chapter VI, sections 3.a. and 4.b. of the DEA and section 4.a. of the Addendum discuss the potential effects the implementation of section 7 for the listed plants will likely have on hunting, as well as the potential indirect effect critical habitat could have on hunting. The direct effects include costs ranging from \$9,000 to \$17,600 for two section 7 consultation between the Service and DLNR and costs ranging from \$50,000 to \$100,000 for project modifications associated with State game management activities. The indirect effects include a slight probability of a change in State game management policy and an undetermined probability of a successful third party lawsuit to mandate conservation management of State and private lands, which could include fencing to exclude feral ungulates. The potential drop in hunting activity translates into a decrease in annual economic activity related to hunting on Kauai of about \$297,000 in direct sales (a figure that includes expenditures on hunting licenses); \$513,000 in total direct and indirect sales; nine jobs; and \$176,000 in income, as well as a loss of \$149,000 in hunter benefits. However, the decrease in expenditures and hunter benefits would probably be off-set by expenditures and benefits associated with other recreational activities, so these figures are likely to overstate the economic costs. If the critical habitat, as modified, is fenced to exclude ungulates, the annual cost of conservation management for the listed

plants would be approximately \$1.8 million.

A critical habitat designation does not in any way create a wilderness area, preserve or wildlife refuge, nor does it close an area to human access or use. It applies only to activities sponsored at least in part by Federal agencies. Land uses such as logging, grazing and recreation that may require Federal permits may take place if they do not adversely modify critical habitat. Critical habitat designations do not constitute land management plans. A designation of critical habitat does not require a private or State landowner to fence the designated area and/or remove game mammals. However, feral ungulates have been extremely important causes of vegetation decline in Hawaii (Cuddihy and Stone 1990) and have been identified as a primary threat to many of the listed plant species on Kauai. The Service recognizes that populations of many game mammal species affect the distribution and abundance of many listed endangered plant and animal species to varying degrees, either directly or indirectly. We also recognize that game mammal hunting is a highly valued activity to a portion of the present-day Hawaiian culture. We recognize hunting as an important tool to manage wild populations of game and support hunting as a recreational activity and the maintenance of game mammal hunting programs within the State of Hawaii. However, Federal and State law dictate that hunting programs should be designed and executed in a way that is compatible with endangered species conservation. Game mammal hunting programs should not only prevent extinction, but allow for the recovery of federally listed endangered and threatened species. The Service also recognizes that under certain circumstances, removal of ungulates can result in an increase in weedy growth and associated fire risk, and we recommend that ungulate management programs assess and address this issue.

(79) *Comment:* The Navy commented that: There is no indication that the specific Navy parcels are, in fact, critical to the survival of these species; the vast majority of the proposed areas to be designated are presently unoccupied by the species in question and their successful introduction to and survival in these areas is speculative; and the proposed areas are presently utilized for national defense operations that may present incompatibilities with the objective of species preservation. Therefore, the benefits of excluding the areas outweigh the benefits of specifying these areas as part of the critical habitat.

Our Response: We have had numerous discussions with the Navy regarding these areas, and as a result, have removed some sections of the units for these species, based on either the lack of primary constituent elements or the presence of structures and areas used for Navy training operations. The remaining areas are not excluded because they contain at least one of the primary constituent elements for *Panicum niahauense* as described in the "Hawaiian plants—Constituent elements" section. These areas are essential to the recovery of *Panicum niahauense* because not enough other areas that contain these primary constituent elements outside of the PMRF are known to exist in order to meet our goals of 8 to 10 populations.

(80) *Comment:* One commenter stated the following: It is not prudent to designate critical habitat on Niihau as it may serve to restrict Federal actions that promote the readiness of our nation's fighting forces. The operations most likely to be impacted would be the Special Warfare and the downed pilot recovery training exercised by the U.S. Marine Corps and U.S. Navy. Disruption of these activities may also result in negative economic impact to Niihau residents.

Our Response: The potential project modifications as a result of the implementation of section 7 for the plants on military activities on Niihau are discussed in Chapter VI, section 3.m. of the DEA. These project modifications include placing stakes in the ground to mark the boundaries of the areas which should be avoided. The Navy may also give maps to military personnel before they are deployed to the area to delineate these areas. The total cost of these project modifications is estimated at \$6,000. Given that the proposed critical habitat as modified covers less than one percent of Niihau, and the military uses much of the island for Special Warfare and the downed pilot recovery training, the avoidance of the areas in critical habitat is not anticipated to have an effect on the readiness of our nation's fighting forces or Niihau residents.

(81) *Comment:* One commenter stated the DEA lacks a thorough benefits analysis. Multiple commenters stated that the DEA ignored the benefit 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. Another commenter noted that additional benefits of critical habitat include combating global warming,

providing recreational opportunities, attracting ecotourism, and preserving Hawaii's natural heritage. Although the DEA makes general observations of the benefits associated with designating critical habitat, it makes no attempt to quantify these acknowledged benefits. The Service must use the tools available such as a University of Hawaii Secretariat for Conservation Biology study that estimated the value of ecosystem services, to determine the benefits of critical habitat. On the other hand, one commenter stated that the DEA overestimates economic benefits and many of the alleged benefits are entirely speculative, unquantifiable or lack any commercial value. In addition, treating "better siting of projects by developers so as to avoid costly project delays," as an economic benefit is circular. The costly project delays result from regulations. They could be avoided by not imposing the regulations in the first place.

Our Response: Chapter VI, Sections 6 and 7 of the DEA discusses the potential benefits addressed in the above comments. However, the DEA also indicates that these benefits are not quantified due to lack of information on the value of the environmental benefits that would be attributable specifically to the critical habitat designations (*i.e.*, the benefits over and above those which will occur due to other existing protections, and over and above the benefits from other conservation projects). In addition, there is a lack of (1) scientific studies regarding ecosystem changes due to critical habitat, and (2) economic studies on the per-unit value of the changes.

The 1999 analysis by University of Hawaii (UH) economists on the total value of environmental services provided by Oahu's Koolau Mountains was used in the DEA as a resource document for concepts, and for identifying documents that report the original research on certain subjects.

However, the UH study has limited applicability for valuing the benefits of plants critical habitat designation 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 Koolau Mountains on the island of Oahu versus the value of the more limited benefits provided by the proposed plants critical habitat on the island of Kauai. Consistent with its purpose, the UH study provides no estimates of the changes in environmental conditions resulting from changes in land management due to critical habitat designations.

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 which is nine percent larger than Kauai but has a population of more than 12 times that of Kauai. 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 so 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 most of the plants critical habitat. As mentioned in the DEA, most of the plants critical habitat units are located in the mountainous interior of Kauai. Much of the proposed critical habitat has steep slopes, remote locations, and difficult access; some of the units are accessible only by helicopter and are rarely visited.

Chapter VI, section 6.c. of the DEA discusses a potential benefit of critical habitat to developers. By knowing the critical habitat boundaries, developers can site projects outside the boundaries, thereby avoiding certain issues related to threatened and endangered species. As such, the benefit is not circular, because, as a result of critical habitat, developers can avoid take issues associated with section 9 of the Act and the other baseline regulations protecting listed species discussed in Chapter IV of the DEA.

(82) *Comment:* Several commenters stated the following: Existence values should be quantified. Studies referenced in the analysis contain information about how much people would be willing to pay to save various species. Even assuming plants are non-charismatic and therefore would justify lower values, there would still be a value of \$6 per household per year. If the study is able to take values for a day of hunting from the State of Idaho and apply them to Hawaii, it should be equally able to take values from studies which have looked at other species to get some sense of what people would pay to make sure these species recover and do not go extinct.

Our Response: When primary research on benefits is not feasible, economists frequently rely on the method of benefits transfer. Benefits transfer involves application of results

of existing valuation studies to a new policy question. Two core principals of defensible benefits transfer are (1) the use of studies that apply acceptable techniques to generate welfare values, and (2) similarity between the good being valued in the literature and the good being valued in the policy context to which the transfer is being made (i.e., the protection afforded the plants by critical habitat). No known studies exist on quantified data on the value of plants. Therefore, applying results of existing valuation studies on non-plants to the Kauai plants is not feasible.

(83) *Comment:* Several commenters stated the following: Active management by private landowners would be more beneficial than critical habitat designations because private landowners can carry out conservation actions that might otherwise not happen. The proposal 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.

Our Response: Chapter VI, section 4.j. of the DEA discusses the potential for reduced cooperation 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.

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) The scientific names changed for the following associated species with the listed species found in the “Supplementary Information: Discussion of the Plant Taxa” section: *Lipochaeta integrifolia* changed to *Melanthera integrifolia* for *Centaurium sebaeoides*; *L. subcordata* changed to *Melanthera subcordata* for *Lipochaeta fauriei*; *Styphelia tameiameia* changed to *Leptocophylla tameiameia* for *Chamaesyce halemanui*, *Delissea rhytidosperra*, *Diellia erecta*, *Diellia pallida*, *Exocarpos luteolus*, *Mariscus pennatifolius*, *Melicope knudsenii*, *Platanthera holochila*, *Poa siphonoglossa*, *Pteralyxia kauaiensis*, *Schiedea kauaiensis*, *Schiedea stellarioides*, *Viola kauaiensis* var. *wahiawaensis*, and *Xylosma*

hawaiiense; *Hibiscus tiliaceus* changed to *Talipariti tiliaceus* for *Cyperus trachysanthos*; *Myrica faya* changed to *Morella faya* for *Diellia erecta* and *Exocarpos luteolus*; *Stachytarpheta dichotoma* changed to *S. australis* for *Brighamia insignis*, *Cyanea undulata*, *Dubautia pauciflora*, *Lipochaeta micrantha*, and *Viola helenae*; *Mariscus meyenianus* changed to *Cyperus meyenianus* for *Diellia erecta* and *Poa mannii*; *Mariscus phleoides* changed to *Cyperus phleoides* for *Centaurium sebaeoides*; *Pluchea symphytifolia* changed to *P. carolinensis* for *Cyanea undulata*, *Dubautia pauciflora*, *Hedyotis st.-johnii*, and *Lipochaeta micrantha*; *Athyrium sandwichianum* changed to *Diplazium sandwichianum* for *Plantago princeps*, *Melicope knudsenii*, *Flueggea neowawraea*, *Euphorbia haelealeana*, *Xylosma crenatum*, *Viola helenae*, *Schiedea membranacea*, *Pteralyxia kauaiensis*, *Phyllostegia wawrana*, *Phyllostegia waimeae*, *Nothocestrum peltatum*, *Dubautia latifolia*, *Delissea rivularis*, *Cyrtandra limahuliensis*, *Cyrtandra cyaneoides*, *Cyanea undulata*, *Cyanea remyi*, and *Alsinidendron lychnoides*; and *Setaria gracilis* changed to *Setaria parviflora* for *Brighamia insignis*, *Cyanea undulata*, and *Dubautia pauciflora*.

(2) We corrected the misidentification of *Passiflora mollissima* to *P. tarminiana* which is an associated species found with the following listed species: *Delissea rhytidosperra*, *Dubautia latifolia*, *Nothocestrum peltatum*, *Phyllostegia wawrana*, *Poa sandwicensis*, *Schiedea membranacea*, *Delissea undulata*, *Diellia erecta*, and *Solanum sandwicense* in the threat section of the species descriptions in the “Supplementary Information: Discussion of the Plant Taxa”.

(3) We changed “spp.” to the specific species which are associated with the following listed species found on Kauai in the “Supplementary Information: Discussion of the Plant Taxa” and section 17.99: *Touchardia* spp. changed to *Touchardia latifolia* for *Cyanea remyi*; *Syzygium* spp. changed to *Syzygium sandwicensis* for *Isodendron longifolium*; *Gunnera* spp. changed to *Gunnera kauaiensis* for *Cyrtandra cyaneoides*, *Plantago princeps*, and *Phyllostegia waimeae*; *Eugenia* spp. changed to *Eugenia reinwardtiana* for *Cyrtandra limahuliensis* and *Isodendron longifolium*; *Pteralyxia* spp. changed to *Pteralyxia kauaiensis* for *Alectryon macrococcus*, *Delissea rhytidosperra*, and *Euphorbia haelealeana*; *Alectryon* spp. changed to *Alectryon macrococcus* for *Phyllostegia wawrana*; *Broussaisia* spp. changed to

Broussaisia arguta for *Adenophorus periens*; *Pleomele* spp. changed to *Pleomele aurea* for *Alsinidendron viscosum*, *Dubautia latifolia*, *Pritchardia napaliensis*, and *Alectryon macrococcus*; and *Antidesma* spp. changed to *Antidesma platyphyllum* for *Cyanea remyi*, *Cyanea undulata*, *Cyrtandra limahuliensis*, *Dubautia latifolia*, *Hesperomannia lydgatei*, *Hibiscus waimeae* ssp. *hannerae*, *Kokia kauaiensis*, *Lipochaeta micrantha*, *Nothocestrum peltatum*, *Pritchardia viscosa*, *Alectryon macrococcus*, *Flueggea neowawraea*, *Isodendron laurifolium*, and *Isodendron longifolium*.

(4) For species associated with listed species, we replaced specific species names for those that do not exist on Kauai with “spp.” for genera with multiple species on Kauai in the “Supplementary Information: Discussion of the Plant Taxa” and section 17.99 as follows: *Cibotium chamissoi* changed to *Cibotium* spp. for *Phlegmariurus nutans*; *Peperomia leptostachya* changed to *Peperomia* spp. for *Wilkesia hobdyi*; *Lipochaeta succulenta* and *Lipochaeta heterophylla* changed to *Lipochaeta* spp. for *Centaurium sebaeoides*; *Coprosma grayana* changed to *Coprosma* spp. for *Viola kauaiensis* var. *wahiawaensis*; *Peperomia macraeana* changed to *Peperomia* spp. for *Exocarpos luteolus* and *Phyllostegia wawrana*; *Schiedea lydgatei* var. *attenuata* changed to *Schiedea* spp. for *Poa mannii*; *Adenophorus oligadenus* changed to *Adenophorus* spp. for *Delissea rhytidosperra*; and *Cyanea hirta* changed to *Cyanea* spp. for *Xylosma crenatum*.

(5) We corrected the species name to the species that occurs on Kauai for species associated with listed species in the “Supplementary Information: Discussion of the Plant Taxa” and section 17.99 as follows: *Santalum ellipticum* changed to *Santalum freycinetianum* for *Lipochaeta waimeaeensis* and *Delissea undulata*; and *Pteralyxia sandwicensis* changed to *Pteralyxia kauaiensis* for *Delissea rhytidosperra* and *Euphorbia haeleeleana*.

(6) We removed the following species from the list of associated species from the “Supplementary Information: Discussion of the Plant Taxa” and section 17.99 as they do not occur on Kauai: *Abutilon sandwicense* was removed from *Melicope pallida*; *Reynoldsia sandwicensis* was removed from *Euphorbia haeleeleana*; *Rhynchospora laxa* was removed from *Platanthera holochila*; and *Antidesma*

pulvinatum was removed from *Flueggea neowawraea*.

(7) In order to avoid confusion regarding the number of location occurrences for each species (that does not necessarily represent a viable population) and the number of recovery populations (8 to 10 with 100, 300, or 500 reproducing individuals) we changed the word “population” to “occurrence” and updated the number of occurrences and/or individuals for the following species found in the “Supplementary Information: Discussion of the Plant Taxa” section and “Table 2.—Summary of existing occurrences on Kauai and Niihau, and landownership for 95 species reported from Kauai and Niihau”: *Adenophorus periens* changed from 80 individuals to 59; *Alectryon macrococcus* changed from six populations to 18 occurrences and from 204 individuals to 159–174; *Alsinidendron lychnoides* changed from two populations to four occurrences and from 10 individuals to eight; *Alsinidendron viscosum* changed from five populations to seven occurrences and from 263 individuals to 319; *Bonamia menziesii* changed from eight populations to nine occurrences and from 62 individuals to 36; *Brighamia insignis* changed from 65 individuals to 42–62; *Centaurium sebaeoides* changed from 52 individuals to 22–52; *Chamaesyce halemanui* changed from six populations to nine occurrences and from 143 individuals to 85–135; *Cyanea asarifolia* changed from one population to two occurrences and from five individuals to 4–5; *Cyanea recta* changed from seven populations to eight occurrences and from 609 individuals to 198–208; *Cyanea remyi* changed from 374 individuals to 394–484; *Cyperus trachysanthos* changed from two populations to one occurrence; *Cyrtandra cyaneoides* changed from 404 individuals to 354–454; *Cyrtandra limahuliensis* changed from 11 populations to 13 occurrences and from 822 individuals to 2,746–3,024; *Delissea rhytidosperra* changed from 19 individuals to 11; *Diellia pallida* changed from four populations to six occurrences and from 20–25 individuals to 43–48; *Dubautia latifolia* changed from nine populations to 26 occurrences and from 80 individuals to 65–84; *Dubautia pauciflora* changed from two populations to four occurrences; *Euphorbia haeleeleana* changed from seven populations to 23 occurrences; *Exocarpos luteolus* changed from eight populations to nine occurrences; *Flueggea neowawraea* changed from eight populations to 10 occurrences and from 85 individuals to 62; *Hedyotis st.-*

johnii changed from four populations to 11 occurrences and from 296 individuals to 227–292; *Hesperomannia lydgatei* changed from three populations to four occurrences and from 295 individuals to 298; *Hibiscadelphus woodii* changed from one population to two occurrences; *Hibiscus clayi* changed from six individuals to four; *Hibiscus waimeae* ssp. *hannerae* changed from three populations to two occurrences; *Isodendron laurifolium* changed from five populations to 13 occurrences and from 151 individuals to 142–154; *Isodendron longifolium* changed from nine populations to 15 occurrences and from 521 individuals to 804–854; *Kokia kauaiensis* changed from five populations to 21 occurrences and from 166 individuals to 166–171; *Labordia tinifolia* var. *wahiawaensis* changed from 100 individuals to 20–30; *Lipochaeta fauriei* changed from four populations to five occurrences and from 183 individuals to 82; *Lipochaeta micrantha* changed from 231 individuals to 171; *Lobelia niihauensis* changed from 11 populations to 13 occurrences and from 1,106 individuals to 284–2,134; *Lysimachia filifolia* changed from 75 individuals to 20–75; *Melicope haupuensis* changed from five individuals to 13; *Melicope knudsenii* changed from seven populations to 10 occurrences; *Melicope pallida* changed from five populations to six occurrences; *Munroidendron racemosum* changed from 14 populations to 17 occurrences and from 101 individuals to 59–99; *Myrsine linearifolia* changed from eight populations to 12 occurrences and from 522 individuals to 490–564; *Nothocestrum peltatum* changed from six populations to 10 occurrences and from 19 individuals to 20; *Peucedanum sandwicense* changed from 14 populations to 15 occurrences and from 340 individuals to 156–256; *Phyllostegia knudsenii* changed from one population to three occurrences and from 17 individuals to 4–13; *Phyllostegia wawrana* changed from 49 individuals to 34–54; *Plantago princeps* changed from six populations to seven occurrences and from 471 individuals to 542–670; *Platanthera holochila* changed from 28 individuals to 24–34; *Poa sandwicensis* changed from 1,740 individuals to 1,321; *Pritchardia napaliensis* changed from three populations to five occurrences; *Pteralyxia kauaiensis* changed from 15 populations to 39 occurrences and from 807 individuals to 1,124–1,161; *Remya kauaiensis* changed from 12 populations to 17 occurrences and from 124 individuals to 106–114; *Remya*

montgomeryi changed from three populations to six occurrences and from 113 individuals to 143; *Schiedea apokremnos* changed from 751 individuals to 819–1,751; *Schiedea helleri* changed from 63 individuals to 50–60; *Schiedea kauaiensis* changed from two populations to five occurrences; *Schiedea membranacea* changed from seven populations to 10 occurrences and from 195 individuals to 344–348; *Schiedea nuttallii* changed from 50 individuals to 10–50; *Schiedea spergulina* var. *leiopoda* changed from 50 individuals to 135–150; *Schiedea spergulina* var. *spergulina* changed from 206 individuals to 208; *Schiedea stellarioides* changed from two populations to three occurrences and from 400 individuals to 1,500; *Sesbania tomentosa* changed from 18 individuals to 11; *Solanum sandwicense* changed from six populations to eight occurrences; *Spermolepis hawaiiensis* changed from three populations to two occurrences; *Stenogyne campanulata* changed from two populations to three occurrences; *Wilkesia hobdyi* changed from six populations to nine occurrences and from 491 individuals to 406–471; *Xylosma crenatum* changed from 8 individuals to 16; and *Zanthoxylum hawaiiense* changed from two populations to three occurrences.

(8) 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 species *Adenophorus periens*, *Ctenitis squamigera*, *Diellia erecta*, *Diellia pallida*, *Diplazium molokaiense*, and *Phlegmariurus nutans*.

(9) We revised the list of excluded, manmade features in the “Criteria Used to Identify Critical Habitat” and section 17.99 to include additional features based on information received during the public comment periods.

(10) We updated the elevation ranges in section 17.99 for *Adenophorus periens*, *Alectryon macrococcus*, *Alsindendron lychnoides*, *Bonamia menziesii*, *Chamaesyce halemmanui*, *Ctenitis squamigera*, *Cyanea recta*, *Cyanea remyi*, *Cyanea undulata*, *Cyperus trachysanthos*, *Cyrtandra cyaneoides*, *Cyrtandra limahuliensis*, *Delissea rivularis*, *Diellia pallida*, *Diplazium molokaiense*, *Dubautia latifolia*, *Dubautia pauciflorula*, *Euphorbia haeleeleana*, *Exocarpos luteolus*, *Gouania meyenii*, *Hesperomannia lydgatei*, *Hibiscus clayi*, *Ischaemum byrone*, *Isodendron laurifolium*, *Isodendron longifolium*, *Kokia kauaiensis*, *Labordia lydgatei*, *Lipochaeta fauriei*, *Lipochaeta micrantha*, *Lipochaeta waimeaensis*, *Lobelia niihauensis*, *Lysimachia filifolia*, *Mariscus pennatifolius*, *Melicope haupuensis*, *Melicope*

knudsenii, *Melicope pallida*, *Munroidendron racemosum*, *Myrsine linearifolia*, *Nothocestrum peltatum*, *Panicum niihauense*, *Peucedanum sandwicense*, *Phlegmariurus nutans*, *Phyllostegia knudsenii*, *Phyllostegia wawrana*, *Plantago princeps*, *Platanthera holochila*, *Poa sandwicensis*, *Poa siphonoglossa*, *Pteralyxia kauaiensis*, *Remya kauaiensis*, *Schiedea apokremnos*, *Schiedea helleri*, *Schiedea kauaiensis*, *Schiedea membranacea*, *Schiedea nuttallii*, *Schiedea spergulina* var. *leiopoda*, *Schiedea stellarioides*, *Sesbania tomentosa*, *Solanum sandwicense*, *Spermolepis hawaiiensis*, *Xylosma crenatum*, and *Zanthoxylum hawaiiense*.

(11) 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.

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

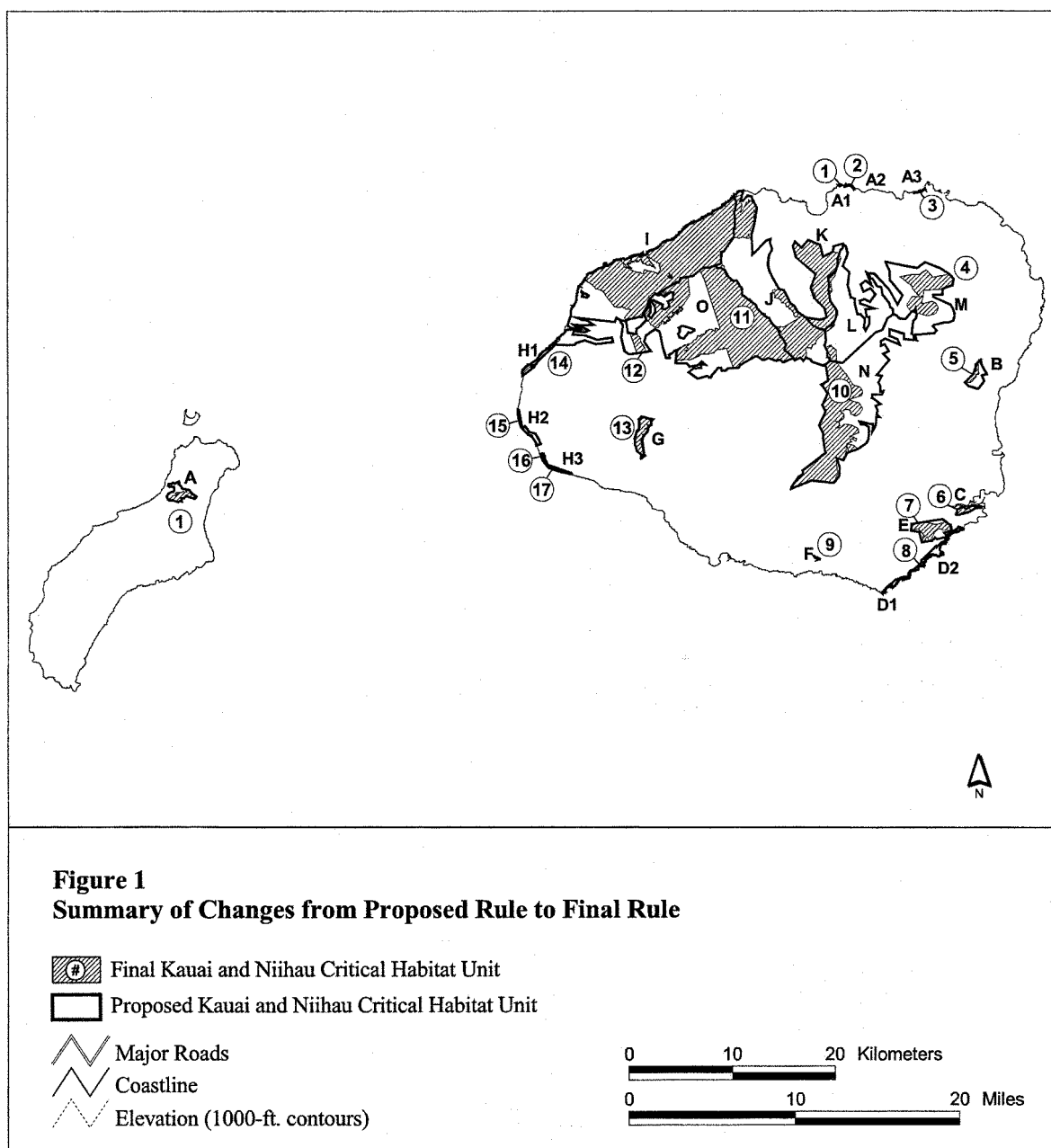
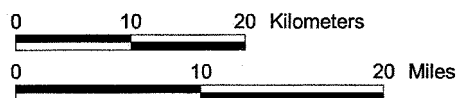


Figure 1
Summary of Changes from Proposed Rule to Final Rule

- Final Kauai and Niihau Critical Habitat Unit
- Proposed Kauai and Niihau Critical Habitat Unit
- Major Roads
- Coastline
- Elevation (1000-ft. contours)



Kauai A

This unit was proposed as critical habitat for two multi-island species: *Centaurium sebaeoides* and *Ischaemum byrone*. We excluded the proposed critical habitat for *Centaurium sebaeoides*. This area is not essential for the conservation of *Centaurium sebaeoides* because it lacks one or more of the primary constituent elements, has a lower proportion of associated native species than other areas we consider to be essential to the conservation of *Centaurium sebaeoides*, is not currently managed for the conservation of this species, and there are at least 10 other locations in its historical range on Kauai and other islands which provide habitat

for this species and which are either designated as critical habitat in this rule or have been proposed for designation in other rules.

Modifications were made to this unit to exclude areas that do not contain the primary constituent elements for *Ischaemum byrone*. The area designated as critical habitat for this species provides habitat within its historical range for two populations.

This modification resulted in the reduction from 15 ha (38 ac) to 13 ha (32 ac). This unit was renamed Kauai 1—*Ischaemum byrone*—a, Kauai 2—*Ischaemum byrone*—b, and Kauai 3—*Ischaemum byrone*—c.

Kauai B

This unit was proposed as critical habitat for two species: *Hibiscus clayi* and *Munroidendron racemosum*. Modifications were made to this unit to exclude areas that do not contain the primary constituent elements essential to the conservation of *Hibiscus clayi* and *Munroidendron racemosum*. The area designated as critical habitat for these two Kauai endemic species provides habitat within their historical ranges for one population of each species.

This modification resulted in the reduction from 271 ha (669 ac) to 60 ha (148 ac). This unit was renamed Kauai 5—*Hibiscus clayi*—f and Kauai 5—*Munroidendron racemosum*—a.

Kauai C

This unit was proposed as critical habitat for two species: *Brighamia insignis* and *Lobelia niihauensis*. We excluded the proposed critical habitat for *Lobelia niihauensis*. This area is not essential for the conservation of *Lobelia niihauensis* because it has a lower proportion of associated native species than other areas we consider to be essential for the conservation of *Lobelia niihauensis*, and there are 10 other locations within its historical range on Kauai and Oahu which provide habitat for two species and which are either designated as critical habitat in this rule or have been proposed for designation in other rules.

Modifications were made to this unit to exclude degraded areas not essential to the conservation of *Brighamia insignis*. The remaining area designated as critical habitat for this endemic species provides habitat within its historical range for one population.

This modification resulted in the reduction from 97 ha (239 ac) to 63 ha (156 ac). This unit was renamed Kauai 6—*Brighamia insignis*—a.

Kauai D

This unit was proposed as critical habitat for the multi-island species *Sesbania tomentosa*. Modifications were made to this unit to exclude degraded areas not essential to the conservation of *Sesbania tomentosa*, including the removal of subunit D1. The remaining area designated as critical habitat for this species provides habitat within its historical range for one population.

This modification resulted in the reduction from 255 ha (629 ac) to 47 ha (117 ac). This unit was renamed Kauai 8—*Sesbania tomentosa*—a.

Kauai E

This unit was proposed as critical habitat for 10 species: *Brighamia insignis*, *Delissea rhytidosperra*, *Isodendron longifolium*, *Lipochaeta micrantha*, *Melicope haupuensis*, *Munroidendron racemosum*, *Myrsine linearifolia*, *Peucedanum sandwicense*, *Pteralyxia kauaiensis* and *Schiedea nuttallii*. Modifications were made to this unit to exclude areas that do not contain the primary constituent elements essential to the conservation of these 10 species.

The area designated as critical habitat for the Kauai and Niihau endemic species *Brighamia insignis* provides habitat within its historical range for one population. The area designated as critical habitat provides habitat within the historical ranges for two populations each of *Delissea rhytidosperra*,

Lipochaeta micrantha, and *Melicope haupuensis*, and one population each of *Munroidendron racemosum*, *Myrsine linearifolia*, and *Pteralyxia kauaiensis*, all Kauai endemic species.

The area designated as critical habitat for the multi-island species *Isodendron longifolium* and *Peucedanum sandwicense* provides habitat within their historical ranges for one population each and for two populations of *Schiedea nuttallii*.

This modification resulted in the reduction from 563 ha (1,390 ac) to 349 ha (862 ac). This unit was renamed Kauai 7—*Brighamia insignis*—b, Kauai 7—*Delissea rhytidosperra*—a, Kauai 7—*Isodendron longifolium*—a, Kauai 7—*Lipochaeta micrantha*—a, Kauai 7—*Melicope haupuensis*—a, Kauai 7—*Munroidendron racemosum*—b, Kauai 7—*Myrsine linearifolia*—a, Kauai 7—*Peucedanum sandwicense*—a, Kauai 7—*Pteralyxia kauaiensis*—a, and Kauai 7—*Schiedea nuttallii*—a.

Kauai F

No changes were made to Kauai F. However, due to revising the polygon to more closely follow geographical and topographical features, a correction has been made to the total acreage. The reduction in area does not affect the ability of this unit to provide habitat for one population of *Schiedea spergulina* var. *leiopoda* in this unit.

The area designated as critical habitat for the Kauai endemic species *Schiedea spergulina* var. *leiopoda* provides habitat within its historical range for one population. The correction resulted in a total of 5 ha (11 ac). This unit was renamed Kauai 9—*Schiedea spergulina* var. *leiopoda*—a.

Kauai G

This unit was proposed as critical habitat for three species: *Lipochaeta waimeaensis*, *Schiedea spergulina* var. *spergulina*, and *Spermolepis hawaiiensis*. Modifications were made to this unit to exclude areas that do not contain the primary constituent elements essential to the conservation of these three species. The reduction in area does not affect the ability of this unit to provide for one to two populations of these three species.

The area designated as critical habitat provides habitat for one population of *Lipochaeta waimeaensis* and two populations of *Schiedea spergulina* var. *spergulina* within the historical ranges of these Kauai endemic species. The area designated as critical habitat for the multi-island species *Spermolepis hawaiiensis* provides habitat within its historical range for one population.

This modification resulted in the reduction from 317 ha (784 ac) to 289 ha (713 ac). This unit was renamed Kauai 13—*Lipochaeta waimeaensis*—a, Kauai 13—*Schiedea spergulina* var. *spergulina*—c, Kauai 13—*Spermolepis hawaiiensis*—b, and Kauai 13—*Spermolepis hawaiiensis*—c.

Kauai H

This unit was proposed as critical habitat for two species, *Panicum niihauense* (a Kauai and Niihau endemic) and *Sesbania tomentosa*. Modifications were made to this unit to exclude areas that do not contain the primary constituent elements essential to the conservation of *Panicum niihauense* based on a site visit conducted during the public comment period. This reduction in area did not affect the ability of this unit to provide habitat for seven populations of this species in this unit. The remaining area designated as critical habitat for *Panicum niihauense* provides habitat within its historical range for seven populations.

Modifications were made to this unit to exclude degraded areas not essential to the conservation of the multi-island species *Sesbania tomentosa*. The area designated as critical habitat for this species provides habitat within its historical range for one population.

These modifications resulted in the reduction from 329 ha (812 ac) to 175 ha (431 ac). This unit was renamed Kauai 14—*Panicum niihauense*—a, Kauai 14—*Sesbania tomentosa*—b, Kauai 15—*Panicum niihauense*—b, Kauai 16—*Panicum niihauense*—c, and Kauai 17—*Panicum niihauense*—d.

Kauai I

This unit was proposed as critical habitat for 60 species: *Adenophorus periens*, *Alectryon macrococcus*, *Alsinidendron lychnoides*, *Bonamia menziesii*, *Brighamia insignis*, *Centaurium sebaeoides*, *Chamaesyce halemanui*, *Ctenitis squamigera*, *Cyanea recta*, *Cyanea remyi*, *Cyperus trachysanthos*, *Cyrtandra limahuliensis*, *Delissea rhytidosperra*, *Delissea rivularis*, *Delissea undulata*, *Diellia pallida*, *Diplazium molokaiense*, *Dubautia latifolia*, *Euphorbia haeleleana*, *Exocarpos luteolus*, *Flueggea neowawraea*, *Gouania meyenii*, *Hedyotis cookiana*, *Hedyotis st.-johnii*, *Hesperomannia lydgatei*, *Hibiscadelphus woodii*, *Hibiscus waimeae* ssp. *hannerae*, *Ischaemum byrone*, *Isodendron laurifolium*, *Isodendron longifolium*, *Kokia kauaiensis*, *Labordia lydgatei*, *Lipochaeta fauriei*, *Lobelia niihauensis*, *Melicope haupuensis*, *Melicope*

knudsenii, *Melicope pallida*, *Munroidendron racemosum*, *Myrsine linearifolia*, *Nothoecstrum peltatum*, *Panicum niihauense*, *Peucedanum sandwicense*, *Phyllostegia wawrana*, *Plantago princeps*, *Platanthera holochila*, *Poa mannii*, *Poa sandwicensis*, *Poa siphonoglossa*, *Pteralyxia kauaiensis*, *Remya kauaiensis*, *Remya montgomeryi*, *Schiedea apokremnos*, *Schiedea kauaiensis*, *Schiedea membranacea*, *Schiedea spergulina* var. *spergulina*, *Sesbania tomentosa*, *Solanum sandwicense*, *Stenogyne campanulata*, *Wilkesia hobdyi*, and *Xylosma crenatum*.

We excluded the proposed critical habitat for *Bonamia menziesii*. This area is not essential for the conservation of *Bonamia menziesii* because it has a lower proportion of associated native species than other areas we consider to be essential for the conservation of *Bonamia menziesii*, and there are at least 10 other locations within its historical range on Kauai and on other islands that provides habitat for this species and that are either designated as critical habitat in this rule or have been proposed for designation in other rules.

Modifications were made to this unit to exclude degraded areas not essential to the conservation of *Brighamia insignis*, *Cyperus trachysanthos*, *Hedyotis st.-johnii*, *Ischaemum byrone*, *Lobelia niihauensis*, *Melicope knudsenii*, *Munroidendron racemosum*, *Nothoecstrum peltatum*, *Peucedanum sandwicense*, *Poa mannii*, *Pteralyxia kauaiensis*, *Remya kauaiensis*, *Schiedea apokremnos*, *Schiedea membranacea*, and *Wilkesia hobdyi* and not managed for the conservation of these 15 species. There are other locations that have been identified to meet the recovery goal of 8 to 10 populations throughout their historical ranges on Kauai (*Brighamia insignis*, *Hedyotis st.-johnii*, *Munroidendron racemosum*, *Nothoecstrum peltatum*, *Poa mannii*, *Pteralyxia kauaiensis*, *Remya kauaiensis*, *Schiedea apokremnos*, *Schiedea membranacea*, and *Wilkesia hobdyi*) and on other islands (*Cyperus trachysanthos*, *Ischaemum byrone*, *Lobelia niihauensis*, *Melicope knudsenii*, and *Peucedanum sandwicense*).

The area designated as critical habitat for the Kauai and Niihau endemic species *Brighamia insignis* provides habitat within its historical range for seven populations. The remaining area designated as critical habitat provides habitat within the historical ranges for six populations of *Alsinidendron lychnoides*, eight populations of *Chamaesyce halemanui*, three

populations each of *Cyanea recta* and *Cyanea remyi*, two populations of *Cyrtandra limahuliensis*, four populations of *Delissea rhytidosperra*, three populations of *Delissea rivularis*, two populations of *Diellia pallida*, one population of *Dubautia latifolia*, eight populations of *Exocarpos luteolus*, seven populations of *Hedyotis st.-johnii*, one population of *Hesperomannia lydgatei*, five populations of *Hibiscadelphus woodii*, eight populations of *Hibiscus waimeae* ssp. *hannerae*, five populations of *Kokia kauaiensis*, one population of *Labordia lydgatei*, four populations of *Lipochaeta fauriei*, three populations of *Melicope haupuensis*, six populations of *Munroidendron racemosum*, three populations of *Myrsine linearifolia*, five populations of *Nothoecstrum peltatum*, four populations of *Phyllostegia wawrana*, seven populations of *Poa mannii*, one population of *Poa sandwicensis*, five populations each of *Poa siphonoglossa* and *Pteralyxia kauaiensis*, six populations of *Remya kauaiensis*, three populations of *Remya montgomeryi*, nine populations of *Schiedea apokremnos*, six populations of *Schiedea kauaiensis*, five populations of *Schiedea membranacea*, two populations of *Schiedea spergulina* var. *spergulina*, three populations of *Stenogyne campanulata*, nine populations of *Wilkesia hobdyi*, and four populations of *Xylosma crenatum*. All of these are Kauai endemic species.

The area designated as critical habitat for the following multi-island species provides habitat within their historical ranges for one population each of *Adenophorus periens* and *Alectryon macrococcus*, four populations of *Centaurium sebaeoides*, one population of *Ctenitis squamigera*, six populations of *Cyperus trachysanthos*, three populations of *Delissea undulata*, one population of *Diplazium molokaiense*, four populations of *Euphorbia haeleeleana*, three populations each of *Flueggea neowawraea* and *Gouania meyenii*, seven populations of *Hedyotis cookiana*, one population of *Ischaemum byrone*, two populations of *Isodendron laurifolium*, three populations of *Isodendron longifolium*, four populations of *Lobelia niihauensis*, three populations each of *Mariscus pennatiformis* and *Melicope knudsenii*, two populations of *Melicope pallida*, three populations of *Peucedanum sandwicense*, two populations of *Plantago princeps*, four populations of *Platanthera holochila*, and five populations of *Solanum sandwicense*.

These modifications resulted in the reduction from 8,238 ha (20,355 ac) to 6,102 ha (15,078 ac). This unit was

renamed Kauai 11—*Adenophorus periens*—d, Kauai 11—*Alectryon macrococcus*—b, Kauai 11—*Alsinidendron lychnoides*—a, Kauai 11—*Brighamia insignis*—c, Kauai 11—*Centaurium sebaeoides*—a, Kauai 11—*Chamaesyce halemanui*—c, Kauai 11—*Ctenitis squamigera*—a, Kauai 11—*Cyanea recta*—d, Kauai 11—*Cyanea remyi*—d, Kauai 11—*Cyperus trachysanthos*—a, Kauai 11—*Cyrtandra limahuliensis*—e, Kauai 11—*Delissea rhytidosperra*—b, Kauai 11—*Delissea rhytidosperra*—c, Kauai 11—*Delissea rivularis*—a, Kauai 11—*Delissea undulata*—a, Kauai 11—*Delissea undulata*—b, Kauai 11—*Diellia pallida*—a, Kauai 11—*Diplazium molokaiense*—a, Kauai 11—*Dubautia latifolia*—b, Kauai 11—*Euphorbia haeleeleana*—a, Kauai 11—*Euphorbia haeleeleana*—b, Kauai 11—*Exocarpos luteolus*—b, Kauai 11—*Exocarpos luteolus*—c, Kauai 11—*Exocarpos luteolus*—e, Kauai 11—*Flueggea neowawraea*—a, Kauai 11—*Flueggea neowawraea*—b, Kauai 11—*Flueggea neowawraea*—d, Kauai 11—*Flueggea neowawraea*—e, Kauai 11—*Flueggea neowawraea*—f, Kauai 11—*Gouania meyenii*—a, Kauai 11—*Gouania meyenii*—b, Kauai 11—*Hedyotis cookiana*—a, Kauai 11—*Hedyotis st.-johnii*—a, Kauai 11—*Hesperomannia lydgatei*—c, Kauai 11—*Hibiscadelphus woodii*—a, Kauai 11—*Hibiscadelphus woodii*—b, Kauai 11—*Hibiscus waimeae* ssp. *hannerae*—a, Kauai 11—*Ischaemum byrone*—d, Kauai 11—*Isodendron laurifolium*—a, Kauai 11—*Isodendron longifolium*—c, Kauai 11—*Isodendron longifolium*—e, Kauai 11—*Kokia kauaiensis*—b, Kauai 11—*Kokia kauaiensis*—c, Kauai 11—*Kokia kauaiensis*—d, Kauai 11—*Labordia lydgatei*—e, Kauai 11—*Lipochaeta fauriei*—b, Kauai 11—*Lobelia niihauensis*—b, Kauai 11—*Mariscus pennatiformis*—a, Kauai 11—*Melicope haupuensis*—b, Kauai 11—*Melicope knudsenii*—a, Kauai 11—*Melicope pallida*—b, Kauai 11—*Munroidendron racemosum*—c, Kauai 11—*Myrsine linearifolia*—d, Kauai 11—*Myrsine linearifolia*—e, Kauai 11—*Nothoecstrum peltatum*—b, Kauai 11—*Nothoecstrum peltatum*—c, Kauai 11—*Peucedanum sandwicense*—b, Kauai 11—*Peucedanum sandwicense*—c, Kauai 11—*Phyllostegia wawrana*—b, Kauai 11—*Phyllostegia wawrana*—d, Kauai 11—*Plantago princeps*—b, Kauai 11—*Plantago princeps*—d, Kauai 11—*Platanthera holochila*—a, Kauai 11—*Poa mannii*—a, Kauai 11—*Poa mannii*—c, Kauai 11—*Poa mannii*—d, Kauai 11—*Poa sandwicensis*—b, Kauai 11—*Poa siphonoglossa*—a, Kauai 11—

Pteralyxia kauaiensis—c, Kauai 11—*Pteralyxia kauaiensis*—d, Kauai 11—*Pteralyxia kauaiensis*—e, Kauai 11—*Pteralyxia kauaiensis*—g, Kauai 11—*Remya kauaiensis*—b, Kauai 11—*Remya kauaiensis*—c, Kauai 11—*Remya montgomeryi*—a, Kauai 11—*Remya montgomeryi*—c, Kauai 11—*Schiedea apokremnos*—a, Kauai 11—*Schiedea apokremnos*—b, Kauai 11—*Schiedea apokremnos*—c, Kauai 11—*Schiedea kauaiensis*—b, Kauai 11—*Schiedea kauaiensis*—c, Kauai 11—*Schiedea kauaiensis*—d, Kauai 11—*Schiedea membranacea*—b, Kauai 11—*Schiedea membranacea*—c, Kauai 11—*Schiedea membranacea*—d, Kauai 11—*Schiedea spergulina* var. *spergulina*—a, Kauai 11—*Solanum sandwicense*—a, Kauai 11—*Stenogyne campanulata*—a, Kauai 11—*Wilkesia hobblyi*—a, Kauai 11—*Xylosma crenatum*—a, Kauai 14—*Panicum niihauense*—a, and Kauai 14—*Sesbania tomentosa*—b.

Kauai J

This unit was proposed as critical habitat for 26 species: *Adenophorus periens*, *Alsinidendron lychnoides*, *Bonamia menziesii*, *Brighamia insignis*, *Cyanea recta*, *Cyanea remyi*, *Cyrtandra cyaneoides*, *Cyrtandra limahuliensis*, *Delissea rivularis*, *Delissea undulata*, *Euphorbia haeleeleana*, *Exocarpos luteolus*, *Hesperomannia lydgatei*, *Hibiscus waimeae* ssp. *hannerae*, *Isodendron longifolium*, *Labordia lydgatei*, *Lobelia niihauensis*, *Munroidendron racemosum*, *Myrsine linearifolia*, *Peucedanum sandwicense*, *Phyllostegia wawrana*, *Plantago princeps*, *Platanthera holochila*, *Remya montgomeryi*, *Schiedea kauaiensis* and *Schiedea membranacea*.

We excluded the proposed critical habitat for the Kauai endemic species *Schiedea membranacea*. This area is not essential for the conservation of this species because there are at least 10 other locations throughout its historical range on Kauai that contain a higher quality habitat or are on lands with a management mandate.

We excluded the proposed critical habitat for the Kauai and Niihau endemic species *Brighamia insignis*. This area is not essential for the conservation of this species because there are at least 10 other locations that have been identified to meet the recovery goal of 8 to 10 populations throughout its historical range on Kauai and Niihau that contain a higher quality habitat and/or are on lands with a management mandate.

We excluded the proposed critical habitat for the multi-island species *Bonamia menziesii*, *Euphorbia haeleeleana*, and *Peucedanum*

sandwicense. These areas are not essential for the conservation of these three species because there are at least 10 other locations that have been identified to meet the recovery goal of 8 to 10 populations of each species throughout their historical ranges on Kauai and other islands that contain a higher quality habitat and/or are on lands with a management mandate.

Modifications were made to this unit to exclude degraded areas not essential to the conservation of *Adenophorus periens*, *Alsinidendron lychnoides*, *Cyanea recta*, *Cyanea remyi*, *Cyrtandra cyaneoides*, *Cyrtandra limahuliensis*, *Delissea rivularis*, *Delissea undulata*, *Exocarpos luteolus*, *Hesperomannia lydgatei*, *Hibiscus waimeae* ssp. *hannerae*, *Isodendron longifolium*, *Labordia lydgatei*, *Lobelia niihauensis*, *Myrsine linearifolia*, *Phyllostegia wawrana*, *Plantago princeps*, *Platanthera holochila*, *Remya montgomeryi*, and *Schiedea kauaiensis*.

The area designated as critical habitat provides habitat for six populations of *Alsinidendron lychnoides*, three populations each of *Cyanea recta* and *Cyanea remyi*, four populations of *Cyrtandra cyaneoides*, six populations of *Cyrtandra limahuliensis*, three populations of *Delissea rivularis*, four populations of *Exocarpos luteolus*, one population of *Hesperomannia lydgatei*, eight populations of *Hibiscus waimeae* ssp. *hannerae*, one population of *Labordia lydgatei*, four populations of *Remya montgomeryi*, and one population of *Schiedea kauaiensis* within the historical ranges of these Kauai endemic species.

The area designated as critical habitat provides habitat for one population each of *Adenophorus periens* and *Delissea undulata*, two populations of *Isodendron longifolium*, five populations of *Lobelia niihauensis*, six populations of *Munroidendron racemosum*, one population of *Myrsine linearifolia*, three populations of *Phyllostegia wawrana*, one population of *Plantago princeps*, and four populations of *Platanthera holochila* within the historical ranges of these multi-island species.

These modifications resulted in the reduction from 5,536 ha (13,681 ac) to 2,026 ha (5,006 ac). This unit was renamed Kauai 11—*Adenophorus periens*—d, Kauai 11—*Alsinidendron lychnoides*—a, Kauai 11—*Cyanea recta*—d, Kauai 11—*Cyanea remyi*—d, Kauai 11—*Cyrtandra cyaneoides*—c, Kauai 10—*Cyrtandra limahuliensis*—c, Kauai 11—*Cyrtandra limahuliensis*—e, Kauai 11—*Delissea rivularis*—a, Kauai 11—*Delissea undulata*—a, Kauai 11—*Exocarpos luteolus*—b, Kauai 11—

Hesperomannia lydgatei—c, Kauai 11—*Hibiscus waimeae* ssp. *hannerae*—a, Kauai 11—*Isodendron longifolium*—e, Kauai 11—*Labordia lydgatei*—e, Kauai 11—*Lobelia niihauensis*—b, Kauai 11—*Munroidendron racemosum*—c, Kauai 11—*Myrsine linearifolia*—d, Kauai 11—*Phyllostegia wawrana*—b, Kauai 10—*Plantago princeps*—a, Kauai 11—*Platanthera holochila*—a, Kauai 10—*Pteralyxia kauaiensis*—b, Kauai 11—*Remya montgomeryi*—b, and Kauai 11—*Schiedea kauaiensis*—a.

Kauai K

This unit was proposed as critical habitat for 13 species: *Adenophorus periens*, *Alsinidendron lychnoides*, *Bonamia menziesii*, *Cyanea recta*, *Cyanea remyi*, *Cyrtandra cyaneoides*, *Cyrtandra limahuliensis*, *Hesperomannia lydgatei*, *Isodendron longifolium*, *Labordia lydgatei*, *Myrsine linearifolia*, *Plantago princeps*, and *Schiedea membranacea*.

We excluded the proposed critical habitat for *Alsinidendron lychnoides*, and *Schiedea membranacea*, two Kauai endemic species, and for *Bonamia menziesii*, a multi-island species. These areas are not essential for the conservation of these three species because they are more degraded than other areas that have been designated to provide habitat for 8 to 10 populations throughout their historical ranges on Kauai (*Alsinidendron lychnoides* and *Schiedea membranacea*) or proposed on other islands (*Bonamia menziesii*.)

Modifications were made to this unit to exclude degraded areas not essential to the conservation of *Adenophorus periens*, *Cyanea recta*, *Cyanea remyi*, *Cyrtandra cyaneoides*, *Cyrtandra limahuliensis*, *Isodendron longifolium*, or *Plantago princeps*. There are other areas that have been identified to meet the recovery goals of 8 to 10 populations of each species throughout their historical ranges on Kauai (*Cyanea recta*, *Cyanea remyi*, *Cyrtandra cyaneoides*, and *Cyrtandra limahuliensis*) and other islands (*Adenophorus periens*, *Isodendron longifolium* and *Plantago princeps*).

The area designated as critical habitat provides habitat for three populations of *Cyanea recta*, one population of *Cyanea remyi*, eight populations of *Cyrtandra cyaneoides*, two populations of *Cyrtandra limahuliensis*, four populations of *Hesperomannia lydgatei*, and one population each of *Labordia lydgatei* and *Myrsine linearifolia* within the historical ranges of these Kauai endemic species.

The area designated as critical habitat provides habitat for one population each of *Adenophorus periens*, *Isodendron*

longifolium, and *Plantago princeps* within the historical ranges for these multi-island species.

These modifications resulted in the reduction from 1,752 ha (4,330 ac) to 1,667 ha (4,119 ac). This unit was renamed Kauai 11—*Adenophorus periens*—c, Kauai 11—*Cyanea recta*—c, Kauai 11—*Cyanea remyi*—c, Kauai 11—*Cyrtandra cyaneoides*—b, Kauai 11—*Cyrtandra cyaneoides*—c, Kauai 11—*Cyrtandra limahuliensis*—d, Kauai 11—*Hesperomannia lydgatei*—b, Kauai 11—*Isodendron longifolium*—d, Kauai 11—*Labordia lydgatei*—c, Kauai 11—*Labordia lydgatei*—d, Kauai 11—*Myrsine linearifolia*—f, and Kauai 11—*Plantago princeps*—c.

Kauai L

This unit was proposed as critical habitat for 13 species: *Adenophorus periens*, *Bonamia menziesii*, *Cyanea recta*, *Cyanea remyi*, *Cyrtandra cyaneoides*, *Cyrtandra limahuliensis*, *Hesperomannia lydgatei*, *Isodendron longifolium*, *Labordia lydgatei*, *Lysimachia filifolia*, *Myrsine linearifolia*, *Plantago princeps* and *Platanthera holochila*.

We excluded the proposed critical habitat for the Kauai endemic species *Hesperomannia lydgatei* and for the multi-island species *Bonamia menziesii*, *Lysimachia filifolia*, and *Platanthera holochila*. These areas are not essential for the conservation of these four species because they are highly degraded and are unlikely to be restored by the State or private landowners (Buck 2002). There are other locations that have been identified to meet the recovery goals of 8 to 10 populations throughout their historical ranges on Kauai (*Hesperomannia lydgatei*) or on other islands (*Bonamia menziesii*, *Lysimachia filifolia*, and *Platanthera holochila*).

Modifications were made to this unit to exclude highly degraded areas not essential to the conservation of *Adenophorus periens*, *Cyanea recta*, *Cyanea remyi*, *Cyrtandra limahuliensis*, *Labordia lydgatei*, *Myrsine linearifolia*, or *Plantago princeps*. In addition, it is unlikely that the State or private landowners will restore these areas (Buck 2002). Other locations are being designated that will provide habitat for 8 to 10 populations of each species throughout their historical ranges on Kauai (*Cyanea recta*, *Cyanea remyi*, *Cyrtandra limahuliensis*, *Labordia lydgatei*, *Myrsine linearifolia*) and on other islands (*Adenophorus periens* and *Plantago princeps*).

The area designated as critical habitat provides habitat for three populations of *Cyanea recta*, one population of *Cyanea*

remyi, eight populations of *Cyrtandra cyaneoides*, six populations of *Cyrtandra limahuliensis*, one population of *Labordia lydgatei*, and one population each of *Myrsine linearifolia* and *Pteralyxia kauaiensis* within the historical ranges for these Kauai and Niihau endemic species.

The area designated as critical habitat provides habitat for one population each of *Adenophorus periens*, *Isodendron longifolium*, and *Plantago princeps* within the historical ranges for these multi-island species.

These modifications resulted in the reduction from 3,407 ha (8,418 ac) to 240 ha (592 ac). This unit was renamed Kauai 11—*Adenophorus periens*—c, Kauai 11—*Cyanea recta*—c, Kauai 11—*Cyanea remyi*—c, Kauai 11—*Cyrtandra cyaneoides*—b, Kauai 11—*Cyrtandra cyaneoides*—c, Kauai 10—*Cyrtandra limahuliensis*—c, Kauai 11—*Cyrtandra limahuliensis*—d, Kauai 11—*Isodendron longifolium*—d, Kauai 11—*Labordia lydgatei*—d, Kauai 11—*Myrsine linearifolia*—f, Kauai 10—*Plantago princeps*—a, Kauai 11—*Plantago princeps*—c, and Kauai 10—*Pteralyxia kauaiensis*—b.

Kauai M

This unit was proposed as critical habitat for nine species: *Adenophorus periens*, *Bonamia menziesii*, *Cyanea asarifolia*, *Cyanea recta*, *Cyanea remyi*, *Cyrtandra cyaneoides*, *Cyrtandra limahuliensis*, *Labordia lydgatei*, and *Phyllostegia wawrana*.

We excluded the proposed critical habitat for the multi-island species *Bonamia menziesii*. This area is not essential for the conservation of this species because it is highly degraded and is unlikely to be restored by the State or private landowners (Buck 2002). There are at least 10 other locations that have been designated or proposed for *Bonamia menziesii* throughout its historical range on Kauai and on other islands.

Modifications were made to this unit to exclude highly degraded areas not essential to the conservation of *Adenophorus periens*, *Cyanea asarifolia*, *Cyanea recta*, *Cyanea remyi*, *Cyrtandra limahuliensis*, *Labordia lydgatei*, and *Phyllostegia wawrana*. In addition, it is unlikely that the State or private landowners will restore these areas (Buck 2002). There are other locations that have been designated to meet the recovery goals of 8 to 10 populations of each species throughout their historical ranges on Kauai (*Cyanea asarifolia*, *Cyanea recta*, *Cyanea remyi*, *Cyrtandra limahuliensis*, *Labordia lydgatei*, and *Phyllostegia wawrana*) and

proposed on other islands (*Adenophorus periens*).

The area designated as critical habitat provides habitat for two populations of *Cyanea asarifolia*, four populations of *Cyanea recta*, two populations of *Cyanea remyi*, two populations each of *Cyrtandra cyaneoides* and *Cyrtandra limahuliensis*, five populations of *Hibiscus clayi*, and two populations each of *Labordia lydgatei* and *Phyllostegia wawrana* within the historical ranges for these Kauai endemic species.

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

These modifications resulted in the reduction from 3,302 ha (8,160 ac) to 1,040 ha (2,570 ac). This unit was renamed Kauai 4—*Adenophorus periens*—a, Kauai 4—*Cyanea asarifolia*—a, Kauai 4—*Cyanea recta*—a, Kauai 4—*Cyanea recta*—b, Kauai 4—*Cyanea remyi*—a, Kauai 4—*Cyrtandra cyaneoides*—a, Kauai 4—*Cyrtandra limahuliensis*—a, Kauai 4—*Cyrtandra limahuliensis*—b, Kauai 4—*Hibiscus clayi*—a, Kauai 4—*Hibiscus clayi*—b, Kauai 4—*Hibiscus clayi*—c, Kauai 4—*Hibiscus clayi*—d, Kauai 4—*Hibiscus clayi*—e, Kauai 4—*Labordia lydgatei*—a, and Kauai 4—*Phyllostegia wawrana*—a.

Kauai N

This unit was proposed as critical habitat for 23 species: *Adenophorus periens*, *Bonamia menziesii*, *Cyanea asarifolia*, *Cyanea recta*, *Cyanea remyi*, *Cyanea undulata*, *Cyrtandra cyaneoides*, *Cyrtandra limahuliensis*, *Delissea rivularis*, *Dubautia pauciflora*, *Exocarpos luteolus*, *Hesperomannia lydgatei*, *Isodendron longifolium*, *Labordia lydgatei*, *Labordia tinifolia* var. *wahiawaensis*, *Lysimachia filifolia*, *Myrsine linearifolia*, *Phlegmariurus nutans*, *Phyllostegia wawrana*, *Plantago princeps*, *Platanthera holochila*, *Viola helenae*, and *Viola kauaiensis* var. *wahiawaensis*.

We excluded the proposed critical habitat for the Kauai endemic species *Cyanea recta*, *Cyrtandra cyaneoides*, *Delissea rivularis*, and *Phyllostegia wawrana*, and for the multi-island species *Platanthera holochila*. These areas are not essential to the conservation of these five species because they are highly degraded and are unlikely to be restored by the State or private landowners (Buck 2002). There are other locations that have been designated to meet the recovery goals of 8 to 10 populations of each species throughout their historical ranges on Kauai (*Cyanea recta*, *Cyrtandra*

cyaneoides, *Delissea rivularis*, and *Phyllostegia wawrana*) or proposed on other islands (*Platanthera holochila*).

Modifications were made to this unit to exclude highly degraded areas not essential to the conservation of *Adenophorus periens*, *Bonamia menziesii*, *Cyanea remyi*, *Cyrtandra limahuliensis*, *Isodendron longifolium*, *Labordia lydgatei*, *Lysimachia filifolia*, and *Plantago princeps*. In addition, it is unlikely that the State or private landowners will restore these areas (Buck 2002). There are other locations that have been designated to meet the recovery goals of 8 to 10 populations of each species throughout their historical ranges on Kauai (*Cyanea remyi*, *Cyrtandra limahuliensis*, and *Labordia lydgatei*) or proposed on other islands (*Adenophorus periens*, *Bonamia menziesii*, *Isodendron longifolium*, *Lysimachia filifolia*, and *Plantago princeps*).

The area designated as critical habitat provides for seven populations of *Cyanea asarifolia*; four populations of *Cyanea remyi*; six populations of *Cyanea undulata*; four populations each of *Cyrtandra limahuliensis* and *Dubautia pauciflora*; one population of *Exocarpos luteolus*; four populations of *Hesperomannia lydgatei*; three populations of *Labordia lydgatei*; four populations of *Labordia tinifolia* var. *wahiawaensis*; one population each of *Myrsine linearifolia* and *Pteralyxia kauaiensis*; and five populations each of *Viola helenae* and *Viola kauaiensis* var. *wahiawaensis* within the historical ranges for these Kauai endemic species.

The area designated as critical habitat provides for one population each of *Adenophorus periens*, *Bonamia menziesii*, and *Isodendron longifolium*, four populations of *Lysimachia filifolia*, three populations of *Phlegmariurus nutans*, and one population of *Plantago princeps* within the historical ranges for these multi-island species.

These modifications resulted in the reduction from 6,599 ha (16,307 ac) to 3,274 ha (8,090 ac). This unit was renamed Kauai 10—*Adenophorus periens*—b, Kauai 10—*Bonamia menziesii*—a, Kauai 10—*Cyanea asarifolia*—b, Kauai 10—*Cyanea remyi*—b, Kauai 10—*Cyanea undulata*—a, Kauai 10—*Cyrtandra limahuliensis*—c, Kauai 10—*Dubautia pauciflora*—a, Kauai 10—*Exocarpos luteolus*—a, Kauai 10—*Hesperomannia lydgatei*—a, Kauai 10—*Isodendron longifolium*—b, Kauai 10—*Labordia lydgatei*—b, Kauai 10—*Labordia tinifolia* var. *wahiawaensis*—a, Kauai 10—*Lysimachia filifolia*—a, Kauai 10—*Myrsine linearifolia*—b, Kauai 10—*Phlegmariurus nutans*—a, Kauai 10—*Plantago princeps*—a, Kauai 10—

Pteralyxia kauaiensis—b, Kauai 10—*Viola helenae*—a, and Kauai 10—*Viola kauaiensis*—a.

Kauai O

This unit was proposed as critical habitat for 51 species: *Adenophorus periens*, *Alectryon macrococcus*, *Alsinidendron lychnoides*, *Alsinidendron viscosum*, *Bonamia menziesii*, *Chamaesyce halemanui*, *Cyanea recta*, *Delissea rivularis*, *Diellia erecta*, *Diellia pallida*, *Diplazium molokaiensis*, *Dubautia latifolia*, *Euphorbia haeleeleana*, *Exocarpos luteolus*, *Flueggea neowawraea*, *Gouania meyenii*, *Isodendron laurifolium*, *Isodendron longifolium*, *Kokia kauaiensis*, *Lipochaeta fauriei*, *Lipochaeta micrantha*, *Lobelia niihauensis*, *Mariscus pennatiformis*, *Melicope haupuensis*, *Melicope knudsenii*, *Melicope pallida*, *Munroidendron racemosum*, *Myrsine linearifolia*, *Nothocestrum peltatum*, *Peucedanum sandwicense*, *Phyllostegia knudsenii*, *Phyllostegia waimeae*, *Phyllostegia wawrana*, *Plantago princeps*, *Platanthera holochila*, *Poa mannii*, *Poa sandvicensis*, *Poa siphonoglossa*, *Pteralyxia kauaiensis*, *Remya kauaiensis*, *Remya montgomeryi*, *Schiedea helleri*, *Schiedea kauaiensis*, *Schiedea membranacea*, *Schiedea spargulina* var. *spargulina*, *Schiedea stellarioides*, *Solanum sandwicense*, *Spermolepis hawaiiensis*, *Stenogyne campanulata*, *Xylosma crenatum*, and *Zanthoxylum hawaiiense*.

We excluded the proposed critical habitat for the Kauai endemic species *Cyanea recta* and for the multi-island species *Adenophorus periens*, *Diplazium molokaiensis*, *Isodendron longifolium*, *Mariscus pennatiformis*, *Peucedanum sandwicense*, and *Plantago princeps*. These areas are not essential for the conservation of these seven species because there are other locations that have been designated to meet the recovery goals of 8 to 10 populations of each species on Kauai (*Cyanea recta*) and proposed on other islands (*Adenophorus periens*, *Diplazium molokaiensis*, *Isodendron longifolium*, *Mariscus pennatiformis*, *Peucedanum sandwicense*, and *Plantago princeps*) that either contain higher quality habitat or have a management mandate.

Modifications were made to this unit to exclude degraded areas not essential to the conservation of *Alectryon macrococcus*, *Alsinidendron lychnoides*, *Alsinidendron viscosum*, *Chamaesyce halemanui*, *Delissea rivularis*, *Diellia erecta*, *Diellia pallida*, *Dubautia latifolia*, *Euphorbia haeleeleana*, *Exocarpos luteolus*,

Flueggea neowawraea, *Gouania meyenii*, *Isodendron laurifolium*, *Kokia kauaiensis*, *Lipochaeta fauriei*, *Lipochaeta micrantha*, *Lobelia niihauensis*, *Melicope haupuensis*, *Melicope knudsenii*, *Melicope pallida*, *Munroidendron racemosum*, *Myrsine linearifolia*, *Nothocestrum peltatum*, *Phyllostegia knudsenii*, *Platanthera holochila*, *Poa mannii*, *Poa sandvicensis*, *Poa siphonoglossa*, *Pteralyxia kauaiensis*, *Remya kauaiensis*, *Remya montgomeryi*, *Schiedea helleri*, *Schiedea membranacea*, *Schiedea spargulina* var. *spargulina*, *Schiedea stellarioides*, *Solanum sandwicense*, *Spermolepis hawaiiensis*, *Xylosma crenatum*, *Zanthoxylum hawaiiense*.

The area designated as critical habitat provides for ten populations of *Alsinidendron lychnoides*, nine populations of *Alsinidendron viscosum*, two populations of *Chamaesyce halemanui*, three populations of *Delissea rivularis*, one population of *Diellia pallida*, seven populations of *Dubautia latifolia*, eight populations of *Exocarpos luteolus*, three populations of *Kokia kauaiensis*, two populations each of *Lipochaeta fauriei*, *Lipochaeta micrantha*, *Melicope haupuensis*, and *Munroidendron racemosum*, five populations of *Myrsine linearifolia*, nine populations of *Nothocestrum peltatum*, three populations of *Phyllostegia waimeae*, two populations of *Phyllostegia wawrana*, three populations of *Poa mannii*, six populations of *Poa sandvicensis*, ten populations of *Poa siphonoglossa*, two populations of *Pteralyxia kauaiensis*, four populations of *Remya kauaiensis*, six populations of *Remya montgomeryi*, seven populations of *Schiedea helleri*, two populations each of *Schiedea kauaiensis*, *Schiedea membranacea*, and *Schiedea spargulina* var. *spargulina*, six populations of *Schiedea stellarioides*, three populations of *Stenogyne campanulata*, and five populations of *Xylosma crenatum* within the historical ranges for these Kauai endemic species.

The area designated as critical habitat provides for one population each of *Alectryon macrococcus*, *Bonamia menziesii*, and *Diellia erecta*, two populations of *Euphorbia haeleeleana*, one population of *Flueggea neowawraea*, two populations each of *Gouania meyenii*, *Isodendron laurifolium*, *Lobelia niihauensis*, and *Melicope knudsenii*, one population of *Melicope pallida*, four populations of *Platanthera holochila*, six populations of *Solanum sandwicense*, one population of *Spermolepis hawaiiensis*, and two populations of *Zanthoxylum*

hawaiiense within the historical range for these multi-island species.

These modifications resulted in the reduction from 9,462 ha (23,382 ac) to 5,933 ha (14,661 ac). This unit was renamed Kauai 11—*Alectryon macroccus*—a, Kauai 11—*Alsinidendron lychnoides*—a, Kauai 11—*Alsinidendron lychnoides*—b, Kauai 11—*Alsinidendron viscosum*—c, Kauai 11—*Alsinidendron viscosum*—a, Kauai 11—*Alsinidendron viscosum*—b, Kauai 11—*Alsinidendron viscosum*—c, Kauai 11—*Alsinidendron viscosum*—d, Kauai 11—*Bonamia menziesii*—b, Kauai 11—*Chamaesyce halemanui*—a, Kauai 11—*Chamaesyce halemanui*—b, Kauai 11—*Delissea rivularis*—a, Kauai 11—*Diellia erecta*—a, Kauai 11—*Diellia pallida*—b, Kauai 11—*Dubautia latifolia*—a, Kauai 11—*Dubautia latifolia*—b, Kauai 11—*Dubautia latifolia*—c, Kauai 11—*Euphorbia haeleeleana*—c, Kauai 11—*Exocarpos luteolus*—b, Kauai 11—*Exocarpos luteolus*—d, Kauai 11—*Exocarpos luteolus*—e, Kauai 11—*Flueggea neowawraea*—c, Kauai 11—*Gouania meyenii*—c, Kauai 11—*Isodendron laurifolium*—b, Kauai 11—*Kokia kauaiensis*—a, Kauai 11—*Lipochaeta fauriei*—a, Kauai 11—*Lipochaeta micrantha*—b, Kauai 11—*Lobelia niihauensis*—a, Kauai 11—*Melicope haupuensis*—c, Kauai 11—*Melicope knudsenii*—b, Kauai 11—*Melicope pallida*—a, Kauai 11—*Munroidendron racemosum*—d, Kauai 11—*Myrsine linearifolia*—c, Kauai 11—*Myrsine linearifolia*—e, Kauai 11—*Nothocestrum peltatum*—a, Kauai 11—*Nothocestrum peltatum*—b, Kauai 11—*Nothocestrum peltatum*—c, Kauai 12—*Nothocestrum peltatum*—d, Kauai 11—*Phyllostegia knudsenii*—a, Kauai 11—*Phyllostegia waimeae*—a, Kauai 11—*Phyllostegia waimeae*—b, Kauai 11—*Phyllostegia wawrana*—c, Kauai 11—*Platanthera holochila*—a, Kauai 11—*Poa mannii*—b, Kauai 11—*Poa sandwicensis*—a, Kauai 11—*Poa siphonoglossa*—a, Kauai 11—*Poa siphonoglossa*—b, Kauai 11—*Pteralyxia kauaiensis*—f, Kauai 11—*Remya kauaiensis*—a, Kauai 11—*Remya kauaiensis*—d, Kauai 11—*Remya kauaiensis*—e, Kauai 12—*Remya kauaiensis*—f, Kauai 11—*Remya montgomeryi*—b, Kauai 11—*Remya montgomeryi*—c, Kauai 11—*Schiedea helleri*—a, Kauai 11—*Schiedea helleri*—b, Kauai 11—*Schiedea helleri*—c, Kauai 11—*Schiedea kauaiensis*—b, Kauai 11—*Schiedea membranacea*—a, Kauai 11—*Schiedea spergulina* var. *spergulina*—b, Kauai 11—*Schiedea stellarioides*—a, Kauai 11—*Schiedea stellarioides*—b, Kauai 11—*Solanum sandwicense*—a,

Kauai 11—*Solanum sandwicense*—b, Kauai 11—*Spermolepis hawaiiensis*—a, Kauai 11—*Stenogyne campanulata*—a, Kauai 11—*Xylosma crenatum*—a, Kauai 12—*Xylosma crenatum*—b, and Kauai 11—*Zanthoxylum hawaiiense*—a.

Niihau A

This unit was proposed as critical habitat for two species, *Brighamia insignis* and *Cyperus trachysanthos*. We excluded the proposed critical habitat for the multi-island species *Cyperus trachysanthos*. This area is not essential for the conservation of *Cyperus trachysanthos* because it is more degraded than other areas and is not managed for the conservation of this species, and there are at least 10 other locations that have been designated to meet the recovery goal of 8 to 10 populations throughout its historical range on Kauai and proposed on other islands.

The area designated as critical habitat for the Kauai and Niihau endemic species *Brighamia insignis* provides habitat within its historical range for one population.

This modification resulted in the reduction from 282 ha (697 ac) to 144 ha (357 ac). This unit was renamed Niihau 1—*Brighamia insignis*—a.

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 “* * * the direct or indirect alteration that

appreciably diminishes the value of critical habitat for both the survival and recovery of a listed species. Such alterations include, but are not limited to, alterations adversely modifying any of those physical or biological features that were the basis for determining the habitat to be critical.” The relationship between a species survival and its recovery has been a source of confusion to some in the past. We believe that a species’ ability to recover depends on its ability to survive into the future when its recovery can be achieved; thus, the concepts of long-term survival and recovery are intricately linked. 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, the habitat must first be “essential to the conservation of the species.” Critical habitat designations identify, to the extent known, using the best scientific and commercial data available, habitat areas that provide essential life-cycle needs of the species (*i.e.*, areas on which are found the primary constituent elements, as defined at 50 CFR 424.12(b)).

Section 4 requires that we designate critical habitat 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. 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 currently known to be essential. Essential areas should already have some of the features and habitat characteristics that are necessary to sustain the species. We will not speculate about what areas might be found to be essential if better information became available, or what areas may become essential over time. If the information available at the time of designation does not show that an area provides essential life cycle needs of the species, then the area should not be

included in the critical habitat designation.

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.

A. Prudence

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

To determine whether critical habitat would be prudent for each species, we analyzed the potential threats and benefits for each species in accordance with the court's order. Two species, *Acaena exigua*, a multi-island species, and *Melicope quadrangularis*, a Kauai endemic species, are no longer extant in the wild. *Acaena exigua* was last seen in 2000 and no individuals were seen in a subsequent visit in 2001 to the last known location (Oppenheimer, pers. comm. 2002). *Melicope quadrangularis* was last observed in the Wahiawa drainage area in 1991. This species has not been seen in surveys of this area subsequent to Hurricane Iniki in 1992 (S. Perlman and K. Wood, pers. comm. 2000). In addition, neither species is known to be in storage or under propagation. Under these circumstances, designation of critical habitat for *Acaena exigua* and *Melicope quadrangularis* is not prudent because such designation would be of no benefit to these species. If either species is relocated we may revise this final determination to incorporate or address new information as new data becomes available (See 16 U.S.C. 1532 (5)(B); 50 CFR 424.13(f)).

Due to low numbers of individuals and/or populations and their inherent immobility, the other 93 plants may be vulnerable to unrestricted collection, vandalism, or disturbance. We examined the evidence currently available for each of these taxa and found specific evidence of vandalism, disturbance, and/or the threat of unrestricted collection for three species of *Pritchardia*, the native palm, on Kauai and Niihau. At the time of listing we determined that designation of critical habitat was not prudent for *Pritchardia napaliensis*, *P. aylmer-robinsonii*, and *P. viscosa* because it would increase the degree of threat from vandalism or collecting, and would provide no benefits (60 FR 53070). At

that time, we had information that at least one of the remaining adult plants has been damaged by spiked boots used either by a botanist or seed collector to scale these trees (61 FR 53070). Since publication of the listing rule, we learned of additional instances of vandalism, collection, and commercial trade involving these three species of *Pritchardia*. In 1993, the State's DOFAW planted 39 young *Pritchardia napaliensis* plants within a fenced enclosure near the Wailua River. A short time after this, the fence was vandalized and all 39 plants were removed (A. Kyono, pers. comm. 2000; Craig Koga, DOFAW, *in litt.* 1999). In mid-1996, a young plant and seeds of *Pritchardia viscosa* were removed from the only known location of this species (A. Kyono, pers. comm. 2000; C. Koga, *in litt.* 1999). Recently we received information on the commercial trade in palms conducted through the internet (Grant Canterbury, USFWS, *in litt.* 2000). Several nurseries advertise and sell seedlings and young plants, including 13 species of Hawaiian *Pritchardia*. Seven of these species are federally protected, including *Pritchardia aylmer-robinsonii* and *P. napaliensis*.

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

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

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

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

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

On January 9, 2003, we found that critical habitat was prudent for the following 15 multi-island species: *Adenophorus periens*, *Bonamia menziesii*, *Centaurium seabaeoides*, *Ctenitis squamigera*, *Cyperus trachysanthos*, *Diellia erecta*, *Diplazium molokaiense*, *Hibiscus brackenridgei*, *Isodendron piriifolium*, *Sesbania*

tomentosa, *Silene lanceolata*, *Solanum incompletum*, *Spermolepis hawaiiensis*, *Vigna o-wahuensis* and *Zanthoxylum hawaiiense* (68 FR 1220), which also occur on Kauai or Niihau.

Four species no longer occur on Kauai or Niihau but are reported from one or more other islands. To find whether critical habitat would be prudent for these four species we analyzed the potential threats and benefits for each species in accordance with the court's orders. These four plants were listed as endangered species under the Act between 1991 and 1996. At the time each plant was listed, we determined that designation of critical habitat was not prudent because designation would increase the degree of threat to the species and/or would not benefit the plant. We examined the evidence available for these four species and have not, at this time, found specific evidence of taking, vandalism, collection, or trade of these species or of similar species. Consequently, while we remain concerned that these activities could potentially threaten *Achyranthes mutica*, *Mariscus pennatifolius*, *Phlegmariurus manni*, and *Phlegmariurus nutans* 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 these species are currently threatened by taking or other human activity, which would be exacerbated by the designation of critical habitat. In the absence of finding that critical habitat would increase threats to a species, if there are any benefits to critical habitat designation, then a prudent finding is warranted. The potential benefits include (1) triggering section 7 consultation in new areas where it would not otherwise occur because, for example, it is or has become unoccupied or the occupancy is in question; (2) focusing conservation activities on the most essential areas; (3) providing educational benefits to State or county governments or private entities; and (4) preventing people from causing inadvertent harm to the species. In the case of *Achyranthes mutica*, *Mariscus pennatifolius*, *Phlegmariurus manni*, and *Phlegmariurus nutans* 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. None of these four species are reported from Federal lands on Kauai (the entire island of Niihau is privately owned) where actions are subject to section 7 consultation. However, two of

these species, *Phlegmariurus manni*, and *Phlegmariurus nutans* are reported from Federal lands or lands that are administered by a Federal agency on other islands (*Phlegmariurus nutans* is reported from the United States Army's Schofield Barracks Military Reservation and Kawaihoa Training Area, and the Service's Oahu Forest National Wildlife Refuge on Oahu, and *Phlegmariurus manni* is reported from Haleakala National Park on Maui). Although *Achyranthes mutica* and *Mariscus pennatifolius* are located exclusively on non-Federal lands with limited Federal activities on Oahu and Maui, there could be Federal actions affecting these lands in the future. While a critical habitat designation for habitat currently occupied by *Achyranthes mutica*, *Mariscus pennatifolius*, *Phlegmariurus manni*, and *Phlegmariurus nutans* 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 may also be some educational or informational benefits to the designation of critical habitat. Educational benefits include the notification of landowner(s), land managers, and the general public of the importance of protecting the habitat of these species and dissemination of information regarding their essential habitat requirements. Therefore, we find that critical habitat is prudent for these four species (*Achyranthes mutica*, *Mariscus pennatifolius*, *Phlegmariurus manni*, and *Phlegmariurus nutans*).

We examined the evidence available for the other 71 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 71 plant species in the future, consistent with applicable regulations (50 CFR 424.12(a)(1)(i)) and the court's discussion of these regulations, we do not find that any of these species are currently threatened by taking or other human activity, which would be exacerbated by the designation of critical habitat.

In the absence of finding that critical habitat would increase threats to a species, if there are any benefits to critical habitat designation, then a prudent finding is warranted. The potential benefits include: (1) Triggering section 7 consultation in new areas where it would not otherwise occur because, for example, it is or has

become unoccupied; (2) focusing conservation activities; (3) providing educational benefits to State or county governments or private entities; and (4) preventing people from causing inadvertent harm to the species.

In the case of these 71 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. One of these species is reported on or near Federal lands (see Table 2), 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, designation of critical habitat is prudent for these 71 plant species: *Alectryon macrococcus*, *Alsinidendron lychnoides*, *Alsinidendron viscosum*, *Brighamia insignis*, *Chamaesyce halemanui*, *Cyanea asarifolia*, *Cyanea recta*, *Cyanea remyi*, *Cyanea undulata*, *Cyrtandra cyaneoides*, *Cyrtandra limahuliensis*, *Delissea rhytidosperra*, *Delissea rivularis*, *Delissea undulata*, *Diellia pallida*, *Dubautia latifolia*, *Dubautia pauciflora*, *Euphorbia haeleleana*, *Exocarpos luteolus*, *Flueggea neowawraea*, *Gouania meyenii*, *Hedyotis cookiana*, *Hedyotis st.-johnii*, *Hesperomannia lydgatei*, *Hibiscadelphus woodii*, *Hibiscus clayi*, *Hibiscus waimeae* ssp. *hannerae*, *Ischaemum byrone*, *Isodendron laurifolium*, *Isodendron longifolium*, *Kokia kauaiensis*, *Labordia lydgatei*, *Labordia tinifolia* var. *wahiawaensis*, *Lipochaeta fauriei*, *Lipochaeta micrantha*, *Lipochaeta waimeae*, *Lobelia niihauensis*, *Lysimachia filifolia*, *Melicope haupuensis*, *Melicope*

knudsenii, *Melicope pallida*, *Munroidendron racemosum*, *Myrsine linearifolia*, *Nothoecstrum peltatum*, *Panicum niihauense*, *Peucedanum sandwicense*, *Phyllostegia knudsenii*, *Phyllostegia waimeae*, *Phyllostegia wawrana*, *Plantago princeps*, *Platanthera holochila*, *Poa mannii*, *Poa sandvicensis*, *Poa siphonoglossa*, *Pteralyxia kauaiensis*, *Remya kauaiensis*, *Remya montgomeryi*, *Schiedea apokremnos*, *Schiedea helleri*, *Schiedea kauaiensis*, *Schiedea membranacea*, *Schiedea nuttallii*, *Schiedea spergulina* var. *leiopoda*, *Schiedea spergulina* var. *spergulina*, *Schiedea stellarioides*, *Solanum sandwicense*, *Stenogyne campanulata*, *Viola helenae*, *Viola kauaiensis* var. *wahiawaensis*, *Wilkesia hobdyi*, and *Xylosma crenatum*.

B. 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*, *Alsinidendron lychnoides*, *Alsinidendron viscosum*, *Bonamia menziesii*, *Brighamia insignis*, *Centaurium sebaeoides*, *Chamaesyce halemanui*, *Ctenitis squamigera*, *Cyanea asarifolia*, *Cyanea recta*, *Cyanea remyi*, *Cyanea undulata*, *Cyperus trachysanthos*, *Cyrtandra cyaneoides*, *Cyrtandra limahuliensis*, *Delissea rhytidosperra*, *Delissea rivularis*, *Delissea undulata*, *Diellia erecta*, *Diellia pallida*, *Diplazium molokaiense*, *Dubautia latifolia*, *Dubautia pauciflora*, *Euphorbia haeleleana*, *Exocarpos luteolus*, *Flueggea neowawraea*, *Gouania meyenii*, *Hedyotis cookiana*, *Hedyotis st.-johnii*, *Hesperomannia lydgatei*, *Hibiscadelphus woodii*, *Hibiscus clayi*, *Hibiscus waimeae* ssp. *hannerae*, *Ischaemum byrone*, *Isodendron laurifolium*, *Isodendron longifolium*, *Kokia kauaiensis*, *Labordia lydgatei*, *Labordia tinifolia* var. *wahiawaensis*, *Lipochaeta fauriei*, *Lipochaeta micrantha*, *Lipochaeta waimeae*, *Lobelia niihauensis*, *Lysimachia filifolia*, *Mariscus pennatifolius*, *Melicope haupuensis*, *Melicope knudsenii*, *Melicope pallida*, *Munroidendron racemosum*, *Myrsine linearifolia*, *Nothoecstrum peltatum*, *Panicum niihauense*, *Peucedanum sandwicense*, *Phlegmariurus nutans*, *Phyllostegia knudsenii*, *Phyllostegia waimeae*, *Phyllostegia wawrana*, *Plantago princeps*, *Platanthera holochila*, *Poa mannii*, *Poa sandvicensis*, *Poa siphonoglossa*,

Pteralyxia kauaiensis, *Remya kauaiensis*, *Remya montgomeryi*, *Schiedea apokremnos*, *Schiedea helleri*, *Schiedea kauaiensis*, *Schiedea membranacea*, *Schiedea nuttallii*, *Schiedea spergulina* var. *leiopoda*, *Schiedea spergulina* var. *spergulina*, *Schiedea stellarioides*, *Sesbania tomentosa*, *Solanum sandwicense*, *Spermolepis hawaiiensis*, *Stenogyne campanulata*, *Viola helenae*, *Viola kauaiensis* var. *wahiawaensis*, *Wilkesia hobdyi*, *Xylosma crenatum*, and *Zanthoxylum hawaiiense*. 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, landownership); the final listing rules for these 83 species; the November 7, 2000, proposal; the January 28, 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; information received in response to outreach materials and requests for species and management information that we sent to all landowners, land managers, and interested parties on the islands of Kauai and Niihau; 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 1994, 1995, 1996, 1997, 1998a, 1998b, 1998c, 1999; 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 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 83 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.

C. Primary Constituent Elements

In accordance with section 3(5)(A)(i) of the Act and regulations at 50 CFR 424.12, in determining which areas to propose as critical habitat, we are required to base critical habitat determinations on the best scientific and commercial data available and to consider those physical and biological features (primary 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 *Adenophorus perienis*, *Alectryon macrococcus*, *Alsinidendron lychnoides*, *Alsinidendron viscosum*, *Bonania menziesii*, *Brighamia insignis*, *Centaurium sebaeoides*, *Chamaesyce halemanui*, *Ctenitis squamigera*, *Cyanea asarifolia*, *Cyanea recta*, *Cyanea remyi*, *Cyanea undulata*, *Cyperus trachysanthos*, *Cyrtandra cyaneoides*, *Cyrtandra limahuliensis*, *Delissea rhytidosperra*, *Delissea rivularis*, *Delissea undulata*, *Diellia erecta*, *Diellia pallida*, *Diplazium molokaiense*,

Dubautia latifolia, *Dubautia pauciflora*, *Euphorbia haeleeleana*, *Exocarpos luteolus*, *Flueggea neowawraea*, *Gouania meyenii*, *Hedyotis cookiana*, *Hedyotis st.-johnii*, *Hesperomannia lydgatei*, *Hibiscadelphus woodii*, *Hibiscus clayi*, *Hibiscus waimeae* ssp. *hannerae*, *Ischaemum byrone*, *Isodendron laurifolium*, *Isodendron longifolium*, *Kokia kauaiensis*, *Labordia lydgatei*, *Labordia tinifolia* var. *wahiawaensis*, *Lipochaeta fauriei*, *Lipochaeta micrantha*, *Lipochaeta waimeae*, *Lobelia niihauensis*, *Lysimachia filifolia*, *Mariscus pennatifolius*, *Melicope haupuensis*, *Melicope knudsenii*, *Melicope pallida*, *Munroidendron racemosum*, *Myrsine linearifolia*, *Nothoecium peltatum*, *Panicum niihauense*, *Peucedanum sandwicense*, *Phlegmariurus nutans*, *Phyllostegia knudsenii*, *Phyllostegia waimeae*, *Phyllostegia wawrana*, *Plantago princeps*, *Platanthera holochila*, *Poa mannii*, *Poa sandwicensis*, *Poa siphonoglossa*, *Pteralyxia kauaiensis*, *Remya kauaiensis*, *Remya montgomeryi*, *Schiedea apokremnos*, *Schiedea helleri*, *Schiedea kauaiensis*, *Schiedea membranacea*, *Schiedea nuttallii*, *Schiedea spargulina* var. *leiopoda*, *Schiedea spargulina* var. *spargulina*, *Schiedea stellarioides*, *Sesbania tomentosa*, *Solanum sandwicense*, *Spermolepis hawaiiensis*, *Stenogyne campanulata*, *Viola helenae*, *Viola kauaiensis* var. *wahiawaensis*, *Wilkesia hobdyi*, *Xylosma crenatum*, and *Zanthoxylum hawaiiense* is described in the "Background" section of this final rule.

We are unable to identify these features for *Achyranthes mutica*, *Hibiscus brackenridgei*, *Isodendron pyrifolium*, *Phlegmariurus mannii*, *Silene lanceolata*, *Solanum incompletum*, and *Vigna o-wahuensis*, which no longer occur on the islands of Kauai or Niihau, because information on the physical and biological features (*i.e.*, the primary constituent elements) that are considered essential to the conservation of these seven species is not known.

All areas designated as critical habitat are within the historical range of the 83 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 83 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 Plant Taxa" section above, constitute the primary constituent elements for these species on the islands of Kauai and Niihau.

D. 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). At this time, and consistent with the listing of these species and their recovery plans, the best available information leads us to conclude that the current size and distribution of the extant populations are not sufficient to expect a reasonable probability of long-term survival and recovery of these plant species. Therefore, we used available information, including expert scientific opinion, to identify potentially suitable habitat within the known historic range of each species.

We considered several factors in the selection and proposal of specific boundaries for critical habitat for these 83 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 1994, 1995, 1996, 1997, 1998a, 1998b, 1998c, 1999). 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 are some specific exceptions to this general recovery goal of 8 to 10 populations for species that are believed to be very narrowly distributed on a single island and the proposed critical habitat designations reflect this exception for these species. For example, the recovery goals for *Cyanea undulata*, *Dubautia pauciflora*, *Hesperomannia lydgatei*, *Labordia lydgatei*, and *Viola helenae* are five populations for each species with 250 individuals in each population. The numbers of individuals and populations for these five species are based on our current understanding of these species and our current understanding of the unique biological characteristics of Wahiawa Bog. These numbers should provide for the maintenance of the majority of the genetic diversity of each species, and assurances that a single catastrophic event will not destroy all members of a species (Service 1994). To be considered recovered, the populations of a multi-island species should be distributed among the islands of its known historic range (Service 1994, 1995, 1996, 1997, 1998a, 1998b, 1998c, 1999). A population, for the purposes of this discussion and as defined in the recovery plans for these species, is a unit in which the individuals could be regularly cross-pollinated and influenced by same small-scale events (such as landslides), and which 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, that 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 species life history are typically considered to determine guidelines for species' interim stability and recovery, including longevity, breeding system, growth form, fecundity, ramet (a plant that is an independent member of a clone) production, survivorship, seed 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 variability 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 to 10 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.

In summary, the long-term survival and recovery 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 will be necessary to conserve suitable habitat in these unoccupied units, which in turn will allow for the establishment of additional populations through natural recruitment or managed reintroductions. Establishment of these additional populations will increase the likelihood that the species will survive and recover in the face of normal and stochastic events (*e.g.*, hurricanes, fire, and 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 83 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. We created polygons by overlaying current and historic plant location points onto digital topographic maps of each of the islands.

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

We further evaluated these shape files of suitable habitat. We used several factors 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 designated as proposed critical habitat. A population for this purpose is defined as a discrete aggregation of individuals located a sufficient distance from a neighboring aggregation such that the two are not affected by the same small-scale events and are not believed to be consistently cross-pollinated. In the absence of more specific information indicating the appropriate distance to assure limited cross-pollination, we are using a distance of 1,000 m (3,280 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). We further refined the resulting critical habitat units 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 83 plant species for which critical habitat was proposed on January 28, 2002. We used geographic features (ridge lines, valleys, streams, coastlines, etc.) or manmade features (roads or obvious land use) that created an obvious

boundary for a unit 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, State-wide, for each species using the recovery guidelines (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 and had the highest likelihood of conserving the species. We ranked areas of the proposed critical habitat by the quality of the primary constituent elements (*i.e.*, intact native plant communities, predominance of associated native plants versus nonnative plants), potential as a conservation area (*i.e.*, whether the land is zoned conservation and; whether the landowner is already participating in plant conservation or recovery actions), and current or expected management of known threats (*e.g.*, ungulate control; weed control; nonnative insect, slug, and snail control). We ranked as most essential areas that contain high quality primary constituent elements, are zoned for conservation, and have on-going or expected threat abatement actions. This ranking process also included determining which habitats were representative of the historic geographical and ecological distributions of the species (see "Primary Constituent Elements"). 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. Of these most essential areas, we selected adequate area for our recovery goals of 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 and that may provide habitat for populations above the recovery goal of 8 to 10 were determined not essential for the conservation of the species and were excluded from the final designation. An area that is covered by a plan that meets the criteria as outlined in "Managed Lands" (provides a conservation benefit to the species and assurances that it will be implemented and effective), does not constitute critical habitat as defined by the Act because the primary constituent elements found there are not in need of special management considerations or protection (section 3(5)(a) of the Act).

Within the critical habitat boundaries, section 7 consultation is generally necessary and adverse modification could occur only if the primary constituent elements are affected. Therefore, not all activities within critical habitat would trigger an adverse modification conclusion. 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 83 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; telecommunications towers and associated structures and equipment; electrical power transmission lines and distribution, and communication facilities and regularly maintained associated rights-of-way and access ways; radars; telemetry antennas; missile launch sites; arboreta and gardens; heiau (indigenous places of worship or shrines) and other archaeological sites; airports; other paved areas; 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 this 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 habitat necessary on Kauai and Niihau to provide for the recovery of these 83 species.

Managed Lands

Currently occupied and historically known sites containing one or more of the primary constituent elements considered essential to the conservation of these 83 plant species were examined to determine if additional special management considerations or protection are required above those currently provided. We reviewed all available management information on these plants at these sites, including published reports and surveys; annual performance and progress reports; management plans; grants; memoranda of understanding and cooperative agreements; DOFAW planning documents; internal letters and memos; biological assessments and environmental impact statements; and section 7 consultations. Additionally, we contacted the major private landowners on Kauai and Niihau by mail, and we met with several landowners between the publication of the revised proposal on January 28, 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 Kauai District DOFAW and State Parks office staff to discuss management activities they are conducting on Kauai. In addition, we reviewed new biological information and public comments received during the public comment periods and at the public hearings.

Pursuant to the definition of critical habitat in section 3 of the Act, the primary constituent elements as found in any area so designated must also require "special management considerations or protections." Adequate special management or protection is provided by a legally operative plan that addresses the maintenance and improvement of the essential elements and provides for the long-term conservation of the species. We consider a plan adequate when it: (1) Provides a conservation benefit to the species (*i.e.*, the plan must maintain or provide for an increase in the species' population or the enhancement or restoration of its habitat within the area covered by the plan); (2) provides assurances that the management plan will be implemented (*i.e.*, those responsible for implementing the plan are capable of accomplishing the

objectives, have an implementation schedule and 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.

In determining whether a management plan or agreement provides a conservation benefit to the species, we considered the following:

(1) The factors that led to the listing of the species, as described in the final rules for listing each of the species. Effects of clearing and burning for agricultural purposes and of invasive nonnative 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; 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 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 nonnative insect pollinators for food, and predation of native insect pollinators by nonnative 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 nonnative arthropods, molluscs, and rats, and photosynthesis and water transport are affected by nonnative insects, pathogens, and diseases. Many of these factors interact with one another, thereby compounding effects. Such interactions include nonnative 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 1994, 1995, 1996, 1997, 1998a, 1998b, 1998c, 1999; 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 nonnative species threats, wildfire, and land use changes; and

(3) The management actions needed for assurance of survival and ultimate recovery of Hawaii's endangered plants. These actions are described in our recovery plans for these 83 species (Service 1994, 1995, 1996, 1997, 1998a, 1998b, 1998c, 1999), 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) nonnative 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: Feral ungulate control; wildfire management; nonnative 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 1994, 1995, 1996, 1997, 1998a, 1998b, 1998c,

1999). 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 83 species of plants are found on Federal, State, and private lands on the islands of Kauai and Niihau. Information received in response to our public notices; meetings with landowners of Kauai County and Kauai District DOFAW staff; the November 7, 2000, and January 28, 2002, proposals; public comment periods; and the February 6, 2001, and February 13, 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 land in question does not require special management or protection.

Federal Lands

The Pacific Missile Range Facility (PMRF) at Barking Sands on Kauai's west side is on federally owned or State-leased lands administered by the Navy for instrumented and multi-environment weapon testing and tracking. *Sesbania tomentosa* and *Panicum niihauense* are reported from the dunes on State lands adjacent to the Barking Sands Facility at Polihale State Park. The dune system extends from Polihale State Park through the PMRF to State-owned lands at Kekaha, and may be one of the best intact coastal dune systems remaining on the main Hawaiian Islands. We evaluated the dune habitat at the Barking Sands Facility for *Sesbania tomentosa* and *Panicum niihauense*, (proposed Unit H), as well as the habitat on Navy lands at Makaha Ridge for *Wilkesia hobdyi* (proposed Unit I), and determined that these lands are not essential for the conservation of *Sesbania tomentosa* or *Wilkesia hobdyi*, although they are essential for *Panicum niihauense*. The Navy completed an Integrated Natural Resources Management Plan (INRMP 2001) that addressed some of the issues concerning maintenance and improvement of the essential elements for listed threatened and endangered species on their lands at PMRF and Makaha Ridge. In 2001, we sent a letter pursuant to section 7 of the Act concurring that the actions in the plan would not have an adverse impact on listed threatened or endangered species, but that the plan did not address the specific needs of *Panicum niihauense*.

Management at the Barking Sands Facility lands currently consists of restricting human access and off-road vehicles from the dune ecosystems and mowing landscaped areas. These actions alone are not sufficient to address the factors inhibiting the long-term conservation of *Panicum niihauense*. Therefore, we cannot at this time find that management on these lands under Federal jurisdiction as sufficient to find that they no longer meet the definition of critical habitat. If the Navy revises and implements an INRMP or other endangered species management plans that address the maintenance and improvement of the essential elements for this plant species and provides for its long-term conservation, we will reassess the critical habitat boundaries in light of these management plans.

State of Hawaii Lands

The State lands on the island of Kauai include ceded and leased lands, and those that are administered by the Department of Land and Natural Resources (DLNR). DLNR lands include State Parks, administered by the State Division of State Parks; and Forest Reserves, NARs, and the Alakai Wilderness Preserve, administered by the DOFAW. The DLNR also manages DHHL lands on the island of Kauai. We determined that habitat that is essential to the conservation of the following 78 of the 83 federally threatened or endangered plant species is found on State lands: *Adenophorus periens*, *Alectryon macrococcus*, *Alsinidendron lychnoides*, *Alsinidendron viscosum*, *Bonamia menziesii*, *Brighamia insignis*, *Centaurium sebaeoides*, *Chamaesyce halemanui*, *Ctenitis squamigera*, *Cyanea asarifolia*, *Cyanea recta*, *Cyanea remyi*, *Cyanea undulata*, *Cyperus trachysanthos*, *Cyrtandra cyaneoides*, *Cyrtandra limahuliensis*, *Delissea rhytidosperma*, *Delissea rivularis*, *Delissea undulata*, *Diellia erecta*, *Diellia pallida*, *Diplazium molokaiense*, *Dubautia latifolia*, *Dubautia pauciflora*, *Euphorbia haelealeana*, *Exocarpos luteolus*, *Flueggea neowawraea*, *Gouania meyenii*, *Hedyotis cookiana*, *Hedyotis st.-johnii*, *Hesperomannia lydgatei*, *Hibiscadelphus woodii*, *Hibiscus clayi*, *Hibiscus waimeae* ssp. *hannerae*, *Ischaemum byrone*, *Isodendron laurifolium*, *Isodendron longifolium*, *Kokia kauaiensis*, *Labordia lydgatei*, *Lipochaeta fauriei*, *Lipochaeta micrantha*, *Lipochaeta waimeaensis*, *Lobelia niihauensis*, *Lysimachia filifolia*, *Mariscus pennatifolius*, *Melicope haupuensis*, *Melicope knudsenii*, *Melicope pallida*, *Munroidendron racemosum*, *Myrsine*

linearifolia, *Nothocestrum peltatum*, *Panicum niihauense*, *Peucedanum sandwicense*, *Phlegmariurus nutans*, *Phyllostegia waimeae*, *Plantago princeps*, *Platanthera holochila*, *Poa mannii*, *Poa sandwicensis*, *Poa siphonoglossa*, *Pteralyxia kauaiensis*, *Remya kauaiensis*, *Remya montgomeryi*, *Schiedea apokremnos*, *Schiedea helleri*, *Schiedea kauaiensis*, *Schiedea membranacea*, *Schiedea spargulina* var. *spargulina*, *Schiedea stellarioides*, *Sesbania tomentosa*, *Solanum sandwicense*, *Spermolepis hawaiiensis*, *Stenogyne campanulata*, *Viola helenae*, *Viola kauaiensis* var. *wahiawaensis*, *Wilkesia hobdyi*, *Xylosma crenatum*, and *Zanthoxylum hawaiiense*.

Although the State conducts some conservation management actions on these lands and provides access to others who are conducting such activities, these programs do not adequately address the threats to these listed plant species on their lands. In addition, there are no comprehensive management plans for the long-term conservation of endangered and threatened plants on these lands, no updated detailed reports on management actions conducted, and no assurances that management actions will be implemented. Therefore, we cannot at this time find that management on these State lands is sufficient to find that they do not meet the definition of critical habitat. However, we will work with the State in developing conservation planning efforts.

Private Lands

We determined that habitat that is essential to the conservation of 38 of the 83 federally listed plant species is found on privately owned lands on Kauai and Niihau: *Adenophorus periens*, *Alsinidendron lychnoides*, *Bonamia menziesii*, *Brighamia insignis*, *Cyanea asarifolia*, *Cyanea recta*, *Cyanea remyi*, *Cyanea undulata*, *Cyrtandra cyaneoides*, *Cyrtandra limahuliensis*, *Delissea rhytidosperra*, *Delissea undulata*, *Dubautia pauciflora*, *Exocarpos luteolus*, *Hesperomannia lydgatei*, *Hibiscus clayi*, *Hibiscus waimeae* ssp. *hannerae*, *Ischaemum byrone*, *Isodendron longifolium*, *Labordia lydgatei*, *Labordia tinifolia* var. *wahiawaensis*, *Lipochaeta micrantha*, *Lobelia niihauensis*, *Lysimachia filifolia*, *Melicope haupuensis*, *Munroidendron racemosum*, *Myrsine linearifolia*, *Peucedanum sandwicense*, *Phlegmariurus nutans*, *Phyllostegia wawana*, *Plantago princeps*, *Platanthera holochila*, *Pteralyxia kauaiensis*, *Schiedea nuttallii*, *Schiedea spargulina* var. *leiopoda*, *Sesbania*

tomentosa, *Viola helenae*, and *Viola kauaiensis* var. *wahiawaensis*.

Based on current information, the main activities being conducted by several of these landowners are weeding, control of human access, and planting of native species. In addition, responses and comments we received during the three comment periods and the public hearings, and new information used in preparing this final rule, did not adequately address the threats to these listed plant species on private lands on Kauai and Niihau. In addition, none of the private landowners are implementing management actions which would exclude them from critical habitat under 3(5)(A). If the private landowner is managing their lands that address the maintenance and improvement of the essential elements for these plant species and provide for their long-term conservation, we will reassess the critical habitat boundaries in light of this new information.

The critical habitat areas described below constitute our best assessment of the physical and biological features needed for the conservation of the 83 plant species and the special management needs of these species, and are based on the best scientific and commercial information available and described above. We publish this final rule acknowledging that we have incomplete information regarding many of the primary biological and physical requirements for these species. However, both the Act and the relevant court orders require us to proceed with designation at this time based on the best information available. As new information accrues, we may consider reevaluating the boundaries of areas that warrant critical habitat designation.

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

Critical habitat includes habitat for these 83 species primarily in the upland portions of Kauai, and for one species in the northern portion of Niihau. Lands designated as critical habitat have been divided into a total of 217 units. A brief description of each unit is presented below.

Descriptions of Critical Habitat Units

Kauai 4—*Adenophorus periens*—a

This unit is critical habitat for *Adenophorus periens* and is 237 ha (585 ac) on State (Alakai Wilderness Preserve and Kealia, and Moloaa Forest Reserves) and private land. The unit contains a portion of Waioli and Limahuli Valleys, Ke Ana Kolea and Kahili, Kekoiki,

Leleiwi, Mount Namahana, and Puu Eu Summits. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Adenophorus periens* and is currently occupied with one plant. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. It provides habitat for the westernmost range of the species. The habitat features contained in this unit that are essential for this species include, but are not limited to, *Metrosideros polymorpha* trunks, in riparian banks of stream systems in well-developed, closed, shady canopy. This unit provides for one population within this multi-island species' historical range on Kauai that 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.

Kauai 10—*Adenophorus periens*—b

This unit is critical habitat for *Adenophorus periens* and is 492 ha (1,215 ac) on State (Lihue-Koloa Forest Reserve) and private land. The unit contains a portion of Kalalau Valley, Limahuli Valley, Kanaele Swamp, and Hulua, Kahili, and Kapalaoa Summits. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Adenophorus periens* and is currently occupied with 50 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, *Metrosideros polymorpha* trunks, in riparian banks of stream systems in well-developed, closed, shady canopy. This unit provides for one population within this multi-island species' historical range on Kauai that 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.

Kauai 11—*Adenophorus periens*—c

This unit is critical habitat for *Adenophorus periens* and is 469 ha (1,160 ac) on State (Halelea Forest Reserve) and private land. The unit contains a portion of Kalalau and

Limahuli Valleys, Waiopa, and Kaliko, Namolokama Mountain, and Puu Manu Summits, and. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Adenophorus periens* and is currently occupied with two plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. It provides habitat for the westernmost range of the species. The habitat features contained in this unit that are essential for this species include, but are not limited to, *Metrosideros polymorpha* trunks, in riparian banks of stream systems in well-developed, closed, shady canopy. This unit provides for one population within this multi-island species' historical range on Kauai that 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.

Kauai 11—*Adenophorus periens*—d

This unit is critical habitat for *Adenophorus periens* and is 1,007 ha (2,487 ac) on State (Halelea Forest Reserve, Hono o Na Pali NAR, and Na Pali Coast State Park) and private land. The unit contains a portion of Kalalau and Limahuli Valleys, and Hono o Na Pali, Keanapuka, Moaalele, Pali Eleele, and Pihea Summits. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Adenophorus periens* and is currently occupied with six plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. It provides habitat for the westernmost range of the species. The habitat features contained in this unit that are essential for this species include, but are not limited to, *Metrosideros polymorpha* trunks, in riparian banks of stream systems in well-developed, closed, shady canopy. This unit provides for one population within this multi-island species' historical range on Kauai that 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.

Kauai 11—*Alectryon macrococcus*—a

This unit is critical habitat for *Alectryon macrococcus* and is 382 ha (943 ac) on State land (Alakai Wilderness Preserve). This unit contains portions of Kawaiiki and Kipalau Valleys. This unit provides habitat for one population of 100 mature, reproducing individuals of the long-lived perennial *Alectryon macrococcus* and is currently occupied with between 123 and 133 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. It provides habitat for the westernmost range of the species. The habitat features contained in this unit that are essential for this species include, but are not limited to, dry slopes or gulches in *Diospyros* spp.-*Metrosideros polymorpha* lowland mesic forest, *Metrosideros polymorpha* mixed mesic forest, or *Diospyros* spp. mixed mesic forest. This unit provides for one population within this multi-island species' historical range on Kauai that 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.

Kauai 11—*Alectryon macrococcus*—b

This unit is critical habitat for *Alectryon macrococcus* and is 90 ha (222 ac) on State land (Na Pali Coast State Park) and is completely within the back of Kalalau Valley. The habitat features contained in this unit that are essential for this species include, but are not limited to, dry slopes or gulches in *Diospyros* spp.-*Metrosideros polymorpha* lowland mesic forest, *Metrosideros polymorpha* mixed mesic forest, or *Diospyros* spp. mixed mesic forest. This unit provides habitat for one population of 100 mature, reproducing individuals of the long-lived perennial *Alectryon macrococcus* and is currently occupied with between 35 and 40 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. It provides habitat for the westernmost range of the species. Critical habitat on this island provides for a recovery population within the historical range of this multi-island species.

Kauai 11—*Alsinidendron lychnoides*—a

This unit is critical habitat for *Alsinidendron lychnoides* and is 994 ha (2,457 ac) on State (Alakai Wilderness Preserve, Halelea Forest Reserve, Hono o Na Pali NAR, and Na Pali Coast State Park) and private land. This unit contains portions of the Alakai Trail and Alealau, Hono o Na Pali, Keanapuka, Moaalele, Pihea, Pohakea, and Waiahuakua Summits. This unit provides habitat for six populations of 100 mature, reproducing individuals of the long-lived perennial *Alsinidendron lychnoides* and is currently occupied with three plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, steep riparian clay or silty soil banks in montane wet forests, and is the area most likely to contain a viable seed bank on this side of the island. This unit is geographically separated from the other two units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Alsinidendron lychnoides*—b

This unit is critical habitat for *Alsinidendron lychnoides* and is 138 ha (340 ac) on State land (Alakai Wilderness Preserve) and contains a portion of the Mohihi-Waialae Trail and the Alakai Swamp. This unit provides habitat for two populations of 100 mature, reproducing individuals of the long-lived perennial *Alsinidendron lychnoides* and is currently occupied with one plant. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, steep riparian clay or silty soil banks in montane wet forests. This unit is geographically separated from the other two units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Alsinidendron lychnoides*—c

This unit is critical habitat for *Alsinidendron lychnoides* and is 55 ha

(136 ac) on State land (Alakai Wilderness Preserve) and contains a portion of the Mohihi Waialai Trail, Mohihi Stream and the Alakai Swamp. This unit provides habitat for two populations of 100 mature, reproducing individuals of the long-lived perennial *Alsinidendron lychnoides* and is currently unoccupied. This unit is essential to the conservation of the taxon because it supports habitat that is essential to the establishment of additional populations on Kauai 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, steep riparian clay or silty soil banks in montane wet forests. This unit is geographically separated from the other two units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Alsinidendron viscosum*—a

This unit is critical habitat for *Alsinidendron viscosum* and is 736 ha (1,820 ac) on State land (Alakai Wilderness Preserve). This unit contains portions of Kaluahaulu and Kawaiiki Ridge. This unit provides habitat for seven populations of 300 mature, reproducing individuals of the short-lived perennial *Alsinidendron viscosum* and is currently occupied with 26 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, steep slopes in *Acacia koa-Metrosideros polymorpha* lowland or montane mesic forest. This unit is geographically separated from other units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Alsinidendron viscosum*—b

This unit is critical habitat for *Alsinidendron viscosum* and is 17 ha (42 ac) on State land (Kokee State Park) and contains a portion of Kumuela Ridge. This unit, in combination with *Alsinidendron viscosum*—c, provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Alsinidendron viscosum* and is currently unoccupied. This unit is essential to the conservation of the taxon because it supports habitat

that is essential to the establishment of additional populations on Kauai 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, steep slopes in *Acacia koa-Metrosideros polymorpha* lowland or montane mesic forest. This unit is geographically separated from other units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Alsinidendron viscosum*—c

This unit is critical habitat for *Alsinidendron viscosum* and is 22 ha (55 ac) on State land (Kokee State Park) and contains a portion of Kauaikinana Stream and Kumuela Trail and Ridge. This unit, in combination with *Alsinidendron viscosum*—b, provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Alsinidendron viscosum* and is currently unoccupied. This unit is essential to the conservation of the taxon because it supports habitat that is essential to the establishment of additional populations on Kauai 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, steep slopes in *Acacia koa-Metrosideros polymorpha* lowland or montane mesic forest. This unit is geographically separated from other units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Alsinidendron viscosum*—d

This unit is critical habitat for *Alsinidendron viscosum* and is 61 ha (150 ac) on State land (Alakai Wilderness Preserve) and contains a portion of Mohihi Waialae Trail and Kohua Ridge. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Alsinidendron viscosum* and is currently occupied with 26 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, steep slopes in *Acacia koa-Metrosideros polymorpha* lowland or montane mesic forest. This unit is geographically separated from the other three units designated as critical habitat

for this island-endemic species to avoid all recovery populations from being destroyed by one naturally occurring catastrophe. The 267 other plants on Kauai are not included in critical habitat because the habitat they occupy is not considered essential to the conservation of this species. The more appropriate habitat on Kauai, within its historical range, are being designated as critical habitat.

Kauai 10—*Bonamia menziesii*—a

This unit is critical habitat for *Bonamia menziesii* and is 420 ha (1,038 ac) on State (Lihue-Koloa Forest Reserve) and private land. This unit contains Kahili Summit and portions of Kanaele Swamp. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Bonamia menziesii* and is currently occupied with 25 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. It provides habitat for the westernmost range of the species and wet habitat that is unique to the Kauai populations. The habitat features contained in this unit that are essential for this species include, but are not limited to, dry, mesic, or wet *Metrosideros polymorpha-Cheirodendron-Dicranopteris* forest. This unit provides for one population within this multi-island species' historical range on Kauai that 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.

Kauai 11—*Bonamia menziesii*—b

This unit is critical habitat for *Bonamia menziesii* and is 93 ha (229 ac) on State land (Alakai Wilderness Preserve) and contains a portion of Koaie Stream and Kipalau Valley. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Bonamia menziesii* and is currently occupied with one plant. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. It provides habitat for the westernmost range of the species and wet habitat that is unique to the Kauai populations. The habitat features contained in this unit that are essential for this species include, but are

not limited to, dry, mesic, or wet *Metrosideros polymorpha-Cheirodendron-Dicranopteris* forest. This unit provides for one population within this multi-island species' historical range on Kauai that 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.

Kauai 6—*Brighamia insignis*—a

This unit is critical habitat for *Brighamia insignis* and is 63 ha (156 ac) on private land and contains a portion of Keopaweo Summit on the north side of Mount Haupu. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Brighamia insignis* and is currently occupied with one plant. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, rocky ledges with little soil or steep sea cliffs in lowland dry grasslands or shrublands with annual rainfall that is usually less than 170 cm (65 in). This unit provides for one population within this multi-island species' historical range on Kauai that 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.

Kauai 7—*Brighamia insignis*—b

This unit is critical habitat for *Brighamia insignis* and is 340 ha (843 ac) on private land. This unit contains the Haupu and Naluakeina Summits and Queen Victoria's Profile. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Brighamia insignis* and is currently occupied with one plant. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, rocky ledges with little soil or steep sea cliffs in lowland dry grasslands or shrublands with annual rainfall that is usually less than 170 cm (65 in). This unit provides for one population within this multi-island

species' historical range on Kauai that 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.

Kauai 11—*Brighamia insignis*—c

This unit is critical habitat for *Brighamia insignis* and is 1,639 ha (4,051 ac) on State land (Hono o Na Pali NAR, Puu Ka Pele Forest Reserve, and Milolii, Nualolo Kai, and Na Pali Coast State Parks). This unit contains Alapii, Mukuaiki, and Puanaiea Points; Awaawapuhi, Honopu, Kalalau, Kawaiula, Makaha, Milolii, Nualolo, Paaiki, and Poopooiki Valleys; Hanakoa, Hoolulu, Kalalau, and Waiahuakua Streams; Kalalau Beach and Trail; Kanakou Summit and Nakeikionaiwi Pillar. The habitat features contained in this unit that are essential for this species include, but are not limited to, rocky ledges with little soil or steep sea cliffs in lowland dry grasslands or shrublands with annual rainfall that is usually less than 170 cm (65 in). This unit provides habitat for seven populations of 300 mature, reproducing individuals of the short-lived perennial *Brighamia insignis* and is currently occupied with between 40 and 60 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. This unit provides for seven populations within this multi-island species' historical range on Kauai that are 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.

Niihau 1—*Brighamia insignis*—a

This unit is critical habitat for *Brighamia insignis* and is 144 ha (357 ac) on private land. This unit contains Puu Alala and Mokouia Valley. The habitat features contained in this unit that are essential for this species include, but are not limited to, rocky ledges with little soil or steep sea cliffs in lowland dry grasslands or shrublands with annual rainfall that is usually less than 170 cm (65 in). This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Brighamia insignis* and is currently occupied with at least one plant. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important

for the expansion of the present population, which is currently considered non-viable. This unit provides for one population within this multi-island species' historical range on Niihau that 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.

Kauai 11—*Centaurium sebaeoides*—a

This unit is critical habitat for *Centaurium sebaeoides* and is 155 ha (385 ac) on State land (Hono o Na Pali NAR, Puu Ka Pele Forest Reserve, and Milolii, Nualolo, and Na Pali Coast State Parks). This unit contains Awaawapuhi, Honopu, Kalalau, Milolii, and Nualolo Valleys; Hanakoa, Hoolulu, Kalalau, and Waiahuakua Streams; Mukuaiki and Puanaiea Points; and Kalalau Beach. This unit provides habitat for four populations of 500 mature, reproducing individuals of the annual *Centaurium sebaeoides* and is currently occupied with between 22 and 52 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. It provides habitat for the westernmost range of the species. The habitat features contained in this unit that are essential for this species include, but are not limited to, volcanic or clay soils or cliffs in arid coastal areas. This unit provides for four populations within this multi-island species' historical range on Kauai that are 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.

Kauai 11—*Chamaesyce halemanui*—a

This unit is critical habitat for *Chamaesyce halemanui* and is 108 ha (267 ac) on State land containing Kawaiiki Ridge. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Chamaesyce halemanui* and is currently unoccupied. This unit is essential to the conservation of the taxon because it supports habitat that is essential to the establishment of additional populations on Kauai 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, steep slopes of gulches in mesic *Acacia koa* forests. This unit is geographically separated from the other two units

designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Chamaesyce halemanui*—b

This unit is critical habitat for *Chamaesyce halemanui* and is 17 ha (43 ac) on State land (Kokee State Park) and contains a portion of the east-facing side of Halemanu Valley below the National Aeronautics and Space Administration (NASA) Tracking Station. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Chamaesyce halemanui* and is currently occupied with 30 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, steep slopes of gulches in mesic *Acacia koa* forests. This unit is geographically separated from the other two units designated as critical habitat for this island endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Chamaesyce halemanui*—c

This unit is critical habitat for *Chamaesyce halemanui* and is 1,283 ha (3,172 ac) on State land (Kuia NAR, and Kokee and Na Pali Coast State Parks). This unit contains Mahanaloa Valley, Kainamanu Summit, and Nualolo, Awaawapuhi, and Honopu Trails. This unit provides habitat for eight populations of 300 mature, reproducing individuals of the short-lived perennial *Chamaesyce halemanui* and is currently occupied with between 50 and 100 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, steep slopes of gulches in mesic *Acacia koa* forests. This unit is geographically separated from the other two units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Ctenitis squamigera*—a

This unit is critical habitat for *Ctenitis squamigera* and is 735 ha (1,817 ac) on State land (Kuia NAR). This unit contains Mahanaloa Valley and Milolii Ridge. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Ctenitis squamigera* and is currently unoccupied. This unit is essential to the conservation of the taxon because it supports habitat that is important to the establishment of additional populations on Kauai 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, rock faces in gulches in the understory of *Metrosideros polymorpha*-*Diospyros* spp. mesic forest and diverse mesic forest. It provides habitat for the westernmost range of the species and the rock face habitat requirement that is unique to Kauai. This unit provides for one population within this multi-island species' historical range on Kauai that 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.

Kauai 4—*Cyanea asarifolia*—a

This unit is critical habitat for *Cyanea asarifolia* and is 656 ha (1,619 ac) on State (Kealia and Moloaa Forest Reserves) and private land. This unit contains Ke Ana Kolea, Mount Namahana, and Anahola, Kekoiki, Leleiwi, and Puu Awa Summits. This unit provides habitat for three populations of 300 mature, reproducing individuals of the short-lived perennial *Cyanea asarifolia* and is currently unoccupied. This unit provides habitat that is essential to the establishment of additional populations on Kauai 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, pockets of soil on sheer, wet rock cliffs and waterfalls in lowland wet forests. This unit is geographically separated from the other unit designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 10—*Cyanea asarifolia*—b

This unit is critical habitat for *Cyanea asarifolia* and is 903 ha (2,232 ac) on State (Lihue-Koloa Forest Reserve) and private land. This unit contains Iole, Kalalea, Kamanu, and Palikea Summits. This unit provides habitat for seven populations of 300 mature, reproducing

individuals of the short-lived perennial *Cyanea asarifolia* and is currently occupied with 4 or 5 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, pockets of soil on sheer wet rock cliffs and waterfalls in lowland wet forests. This unit is geographically separated from the other unit designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 4—*Cyanea recta*—a

This unit is critical habitat for *Cyanea recta* and is 252 ha (623 ac) on State (Kealia and Moloaa Forest Reserves) and private land. This unit contains Kahili, Kekoiki, Leleiwi, Namahana, and Puu Eu Summits. This unit provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *Cyanea recta* and is currently occupied with 43 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, gulches or slopes in lowland wet or mesic *Metrosideros polymorpha* forest or shrubland. This unit is geographically separated from the other three units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 4—*Cyanea recta*—b

This unit is critical habitat for *Cyanea recta* and is 352 ha (868 ac) on State (Kealia Forest Reserve) and private land. This unit contains Makaleha and Leleiwi Summits. This unit provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *Cyanea recta* and is currently occupied with 80 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this

species include, but are not limited to, gulches or slopes in lowland wet or mesic *Metrosideros polymorpha* forest or shrubland. This unit is geographically separated from the other three units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Cyanea recta*—c

This unit is critical habitat for *Cyanea recta* and is 553 ha (1,367 ac) on State (Halelea Forest Reserve) and private land. This unit contains Puu Manu and Kaliko Summits, and Mount Namolokama. This unit provides habitat for three populations of 300 mature, reproducing individuals of the short-lived perennial *Cyanea recta* and is currently occupied with between 75 and 85 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, gulches or slopes in lowland wet or mesic *Metrosideros polymorpha* forest or shrubland. This unit is geographically separated from other units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Cyanea recta*—d

This unit is critical habitat for *Cyanea recta* and is 398 ha (982 ac) on State (Halelea Forest Reserve, Hono o Na Pali NAR, and Na Pali Coast State Park) and private land. This unit contains Pali Elele Summit and Limahuli Falls. This unit provides habitat for three populations of 300 mature, reproducing individuals of the short-lived perennial *Cyanea recta* and is currently unoccupied. This unit provides habitat that is essential to the establishment of additional populations on Kauai 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 slopes in lowland wet or mesic *Metrosideros polymorpha* forest or shrubland. This unit is geographically separated from other units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 4—*Cyanea remyi*—a

This unit is critical habitat for *Cyanea remyi* and is 354 ha (874 ac) on State (Kealia Forest Reserve) and private land. This unit contains Leleiwi Summit and portions of the Makaleha Mountains. This unit provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *Cyanea remyi* and is currently occupied with between 11 and 51 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, narrow drainages and seepy stream banks in lowland wet forest or shrubland. This unit is geographically separated from other units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 10—*Cyanea remyi*—b

This unit is critical habitat for *Cyanea remyi* and is 1,904 ha (4,706 ac) on private land. This unit contains Ioloe, Kalalea, Kamanu, Kapalaoa and Palikea Summits. This unit provides habitat for four populations of 300 mature, reproducing individuals of the short-lived perennial *Cyanea remyi* and is currently occupied with between 70 and 120 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, narrow drainages and seepy stream banks in lowland wet forest or shrubland. This unit is geographically separated from other units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Cyanea remyi*—c

This unit is critical habitat for *Cyanea remyi* and is 365 ha (902 ac) on State land (Halelea Forest Reserve), containing Puu Manu Summit. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Cyanea remyi* and is currently occupied with 12 plants. This unit is essential to the

conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, narrow drainages and seepy stream banks in lowland wet forest or shrubland. This unit is geographically separated from other units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Cyanea remyi*—d

This unit is critical habitat for *Cyanea remyi* and is 664 ha (1,642 ac) on State (Halelea Forest Reserve, Hono o Na Pali NAR, and Haena and Na Pali Coast State Parks) and private land. This unit contains Pohakea and Maunapuluo Summits, Hanakapiai and Limahuli Valleys, and Manoa Stream. This unit provides habitat for three populations of 300 mature, reproducing individuals of the short-lived perennial *Cyanea remyi* and is currently occupied with one plant. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, narrow drainages and seepy stream banks in lowland wet forest or shrubland. This unit is geographically separated from other units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 10—*Cyanea undulata*—a

This unit is critical habitat for *Cyanea undulata* and is 1,006 ha (2,483 ac) on State (Lihue-Koloa Forest Reserve) and private land. This unit contains Kanaele Swamp, Kahili, Kapalaoa, and Puu a Uuka Summits. This unit provides habitat for five populations of 250 mature, reproducing individuals of the short-lived perennial *Cyanea undulata* and is currently occupied with 28 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are

essential for this species include, but are not limited to, narrow drainages and seepy stream banks in *Metrosideros polymorpha* dry to wet montane forest or shrubland. This unit is of an appropriate size so that each potential recovery population on Kauai within the unit is geographically separated enough to avoid their destruction by one naturally occurring catastrophic event.

Kauai 11—*Cyperus trachysanthos*—a

This unit is critical habitat for *Cyperus trachysanthos* and is 272 ha (672 ac) on State land (Na Pali Coast State Park and Puu Ka Pele Forest Reserve) and extends along the coast from Makaha point to Hanakoa Valley. This unit provides habitat for six populations of 300 mature, reproducing individuals of the short-lived perennial *Cyperus trachysanthos* and is currently occupied with over 300 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It provides habitat for the westernmost range of the species. The habitat features contained in this unit that are essential for this species include, but are not limited to, wet sites (mud flats, wet clay soil, or wet cliff seeps) on seepy flats or talus slopes. This unit provides for six populations within this multi-island species' historical range on Kauai that are 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.

Kauai 4—*Cyrtandra cyaneoides*—a

This unit is critical habitat for *Cyrtandra cyaneoides* and is 376 ha (929 ac) on State (Kealia and Lihue-Koloa Forest Reserves) and private land. This unit contains Leleiwi, Makaleha, Puu Eu, and Wekiu Summits. This unit provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *Cyrtandra cyaneoides* and is currently occupied with one plant. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, talus rubble on steep slopes or cliffs with water seeps running below, near streams or waterfalls in lowland or montane wet forest or shrubland dominated by *Metrosideros polymorpha* or a mixture of

Metrosideros polymorpha, *Cheirodendron* spp., and *Dicranopteris linearis*. This unit is geographically separated from the other two units designated as critical habitat for this island endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Cyrtandra cyaneoides*—b

This unit is critical habitat for *Cyrtandra cyaneoides* and is 849 ha (2,098 ac) on State (Halelea Forest Reserve) and private land. This unit contains Mount Namolokama and Kaliko and Puu Manu Summits. This unit provides habitat for four populations of 300 mature, reproducing individuals of the short-lived perennial *Cyrtandra cyaneoides* and is currently occupied with between 51 and 101 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, talus rubble on steep slopes or cliffs with water seeps running below, near streams or waterfalls in lowland or montane wet forest or shrubland dominated by *Metrosideros polymorpha* or a mixture of *Metrosideros polymorpha*, *Cheirodendron* spp., and *Dicranopteris linearis*. This unit is geographically separated from the other two units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Cyrtandra cyaneoides*—c

This unit is critical habitat for *Cyrtandra cyaneoides* and is 1,117 ha (2,761 ac) on State (Halelea Forest Reserve) and private land. This unit contains Hinaelele Falls and portions of Mahinakehau Ridge. This unit provides habitat for four populations of 300 mature, reproducing individuals of the short-lived perennial *Cyrtandra cyaneoides* and is currently occupied with over 300 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. The habitat features contained in this unit that are essential for this species include, but are not limited to, talus rubble on steep slopes or cliffs with water seeps running below, near streams

or waterfalls in lowland or montane wet forest or shrubland dominated by *Metrosideros polymorpha* or a mixture of *Metrosideros polymorpha*, *Cheirodendron* spp., and *Dicranopteris linearis*. This unit is geographically separated from the other two units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 4—*Cyrtandra limahuliensis*—a

This unit is critical habitat for *Cyrtandra limahuliensis* and is 501 ha (1,238 ac) on State (Kealia and Moloaa Forest Reserves) and private land. This unit contains portions of Mount Namahana, Leileiwi, Keana Kolea, Puuawa, and Anahola Stream. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Cyrtandra limahuliensis* and is currently occupied with between 51 and 101 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, stream banks in lowland wet forests. This unit is geographically separated from the other four units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe. The six to seven other plants on Kauai are not included in critical habitat because the habitat they occupy is not considered essential to the conservation of this species. The more intact and appropriate habitat within its historical range on Kauai, is being designated as critical habitat.

Kauai 4—*Cyrtandra limahuliensis*—b

This unit is critical habitat for *Cyrtandra limahuliensis* and is 354 ha (874 ac) on State (Kealia Forest Reserve) and private land. This unit contains Leleiwi Summit and portions of the Makaleha Mountains. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Cyrtandra limahuliensis* and is currently occupied with 109 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat

features contained in this unit that are essential for this species include, but are not limited to, stream banks in lowland wet forests. This unit is geographically separated from the other four units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 10—*Cyrtandra limahuliensis*—c

This unit is critical habitat for *Cyrtandra limahuliensis* and is 2,014 ha (4,975 ac) on State (Halelea and Lihue-Koloa Forest Reserves) and private land. This unit contains Iole, Kalalea, Kamanu, Kapalaoa, and Kawaikini Summits, all within the Waialeale area. This unit provides habitat for four populations of 300 mature, reproducing individuals of the short-lived perennial *Cyrtandra limahuliensis* and is currently occupied with between 530 and 707 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. The habitat features contained in this unit that are essential for this species include, but are not limited to, stream banks in lowland wet forests. This unit is geographically separated from the other four units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Cyrtandra limahuliensis*—d

This unit is critical habitat for *Cyrtandra limahuliensis* and is 816 ha (2,018 ac) on State (Halelea Forest Reserve) and private land. This unit contains Kapailu, Mamalahoa, and Puu Manu Summits. This unit provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *Cyrtandra limahuliensis* and is currently occupied with over 2,000 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. The habitat features contained in this unit that are essential for this species include, but are not limited to, stream banks in lowland wet forests. This unit is geographically separated from the other four units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Cyrtandra limahuliensis*—e

This unit is critical habitat for *Cyrtandra limahuliensis* and is 693 ha (1,715 ac) on State (Halelea Forest Reserve, Hono o Na Pali NAR, and Haena and Na Pali Coast State Parks) and private land. This unit contains Hono o Na Pali, Kulanaillia, Maunapuluo, Pali Elele, Pohakea, Summits, Limahuli Falls, and Pohakukane Cliff. This unit provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *Cyrtandra limahuliensis* and is currently occupied with between 50 and 100 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, stream banks in lowland wet forests. This unit is geographically separated from the other four units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 7—*Delissea rhytidosperra*—a

This unit is critical habitat for *Delissea rhytidosperra* and is 221 ha (545 ac) on private land. This unit contains Haupu and Naluakeina Summits and Queen Victoria's Profile. This unit provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *Delissea rhytidosperra* and is currently occupied with four plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, well-drained soils with medium or fine-textured subsoil in *Diospyros* diverse lowland mesic or diverse *Metrosideros polymorpha-Acacia koa* forests. This unit is geographically separated from the other two units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Delissea rhytidosperra*—b

This unit is critical habitat for *Delissea rhytidosperra* and is 258 ha (638 ac) on State land (Kuia NAR and

Puu Ka Pele Forest Reserve). This unit contains portions of Kuia Valley and Milolii Ridge. This unit provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *Delissea rhytidosperra* and is currently occupied with six plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, well-drained soils with medium or fine-textured subsoil in *Diospyros* diverse lowland mesic or diverse *Metrosideros polymorpha-Acacia koa* forests. This unit is geographically separated from the other two units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe. 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 species, the units are of an appropriate distance apart to avoid their destruction by one naturally occurring catastrophic event.

Kauai 11—*Delissea rhytidosperra*—c

This unit is critical habitat for *Delissea rhytidosperra* and is 103 ha (254 ac) on State land (Haena and Na Pali Coast State Parks) within Hanakapiai Valley. This unit provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *Delissea rhytidosperra* and is currently unoccupied. This unit is essential to the conservation of the taxon because it supports habitat that is important to the establishment of additional populations on Kauai 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, well-drained soils with medium or fine-textured subsoil in *Diospyros* diverse lowland mesic or diverse *Metrosideros polymorpha-Acacia koa* forests. This unit is geographically separated from the other two units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Delissea rivularis*—a

This unit is critical habitat for *Delissea rivularis* and is 851 ha (2,102 ac) on State land (Alakai Wilderness Preserve, Halelea Forest Reserve, Hono

o Na Pali NAR, and Na Pali Coast State Park). This unit contains Keanapuka, Moaalele, Pihea, and Waiahuakua Summits. This unit provides habitat for three populations of 300 mature, reproducing individuals of the short-lived perennial *Delissea rivularis* and is currently occupied with 40 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, steep slopes near streams in *Metrosideros polymorpha-Cheirodendron trigynum* montane wet or mesic forest. 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 species, this unit is of an appropriate size so that each potential recovery population on Kauai within the unit is geographically separated enough to avoid destruction by one naturally occurring catastrophic event.

Kauai 11—*Delissea undulata*—a

This unit is critical habitat for *Delissea undulata* and is 256 ha (636 ac) on State (Halelea Forest Reserve, Hono o Na Pali NAR, and Na Pali Coast State Park) and private land. This unit contains Pali Elelee Summit. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Delissea undulata* and is currently unoccupied. This unit is essential to the conservation of the taxon because it supports habitat that is important to the establishment of additional populations on Kauai in order to reach recovery goals. It provides habitat for the westernmost range of the species that is unique to Kauai. The habitat features contained in this unit that are essential for this species include, but are not limited to, dry or open *Metrosideros polymorpha-Acacia koa* forest or *Alphitonia ponderosa* forest. This unit provides for one population within this multi-island species' historical range on Kauai that 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.

Kauai 11—*Delissea undulata*—b

This unit is critical habitat for *Delissea undulata* and is 532 ha (1,314 ac) on State land (Kuia NAR). This unit contains portions of Mahanaloa Valley and Milolii Ridge. This unit provides

habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *Delissea undulata* and is currently occupied with three plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. It provides habitat for the westernmost range of the species that is unique to Kauai. The habitat features contained in this unit that are essential for this species include, but are not limited to, dry or open *Metrosideros polymorpha-Acacia koa* forest or *Alphitonia ponderosa* forest. This unit provides for two populations within this multi-island species' historical range on Kauai that are 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.

Kauai 11—*Diellia erecta*—a

This unit is critical habitat for *Diellia erecta* and is 365 ha (901 ac) on State land (Alakai Wilderness Preserve) containing portions of Kawaiiki Ridge. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Diellia erecta* and is currently occupied with 30 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. It provides habitat for the westernmost range of the species. The habitat features contained in this unit that are essential for this species include, but are not limited to, brown granular soil with leaf litter and occasional terrestrial moss on north-facing slopes in deep shade, or on steep slopes or gulch bottoms in *Metrosideros polymorpha-Dicranopteris linearis* wet forest or *Metrosideros polymorpha* mixed mesic forest with *Acacia koa* and *Acacia koaia* as codominants. This unit provides for one population within this multi-island species' historical range on Kauai that 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. This fern species has wind-blown spores with limited opportunity for germination and growth. Therefore, this species requires large intact areas of land to support a viable population.

Kauai 11—*Diellia pallida*—a

This unit is critical habitat for *Diellia pallida* and is 602 ha (1,487 ac) on State land (Kuia NAR). This unit contains portions of Kuia and Mahanaloa Valleys, and Milolii Ridge. This unit provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *Diellia pallida* and is currently occupied with between 38 and 43 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, bare granular soil with dry to mesophytic leaf litter with a pH of 6.9 to 7.9 on steep slopes in lowland mesic forest. This unit is geographically separated from the other unit designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe. This fern species has wind-blown spores with limited opportunity for germination and growth. Therefore, this species requires large intact areas of land to support a viable population.

Kauai 11—*Diellia pallida*—b

This unit is critical habitat for *Diellia pallida* and is 55 ha (136 ac) on State land within Koaie Canyon. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Diellia pallida* and is currently occupied with three plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, bare granular soil with dry to mesophytic leaf litter with a pH of 6.9 to 7.9 on steep slopes in lowland mesic forest. This unit is geographically separated from the other unit designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe. This fern species has wind-blown spores with limited opportunity for germination and growth. Therefore, this species requires large intact areas of land to support a viable population.

Kauai 11—*Diplazium molokaiense*—a

This unit is critical habitat for *Diplazium molokaiense* and is 430 ha (1,062 ac) on State land (Kuia NAR and Kokee State Park). This unit contains portions of Awaawapuhi, Honopu, and Nualolo Trails. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Diplazium molokaiense* and is currently unoccupied. This unit is essential to the conservation of the taxon because it supports habitat that is essential to the establishment of additional populations on Kauai in order to reach recovery goals. It provides habitat for the westernmost range of the species. The habitat features contained in this unit that are essential for this species include, but are not limited to, brown soil with basalt outcrops near waterfalls in lowland or montane mesic *Metrosideros polymorpha*-*Acacia koa* forest. This unit provides for one population within this multi-island species' historical range on Kauai that 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. This fern species has wind-blown spores with limited opportunity for germination and growth. Therefore, this species requires large intact areas of land to support a viable population.

Kauai 11—*Dubautia latifolia*—a

This unit is critical habitat for *Dubautia latifolia* and is 31 ha (76 ac) on State land (Kokee State Park). This unit provides habitat for three populations of 300 mature, reproducing individuals of the short-lived perennial *Dubautia latifolia* and is currently unoccupied. This unit is essential to the conservation of the taxon because it supports habitat that is essential to the establishment of additional populations on Kauai 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, gentle or steep slopes on well drained soil in semi-open or closed, diverse montane mesic forest dominated by *Acacia koa* and/or *Metrosideros polymorpha*. This unit is geographically separated from the other two units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Dubautia latifolia*—b

This unit is critical habitat for *Dubautia latifolia* and is 1,522 ha (3,764 ac) on State land (Kuia Natural Area Reserve and Kokee State Park). This unit contains portions of Kawaiiki Ridge and Kipalau Valley. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Dubautia latifolia* and is currently occupied with between 50 and 69 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, gentle or steep slopes on well drained soil in semi-open or closed, diverse montane mesic forest dominated by *Acacia koa* and/or *Metrosideros polymorpha*. This unit is geographically separated from the other two units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Dubautia latifolia*—c

This unit is critical habitat for *Dubautia latifolia* and is 809 ha (1,999 ac) on State land (Alakai Wilderness Preserve). This unit contains Iole and Kahili Summits. This unit provides habitat for three populations of 300 mature, reproducing individuals of the short-lived perennial *Dubautia latifolia* and is currently occupied with three plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, gentle or steep slopes on well drained soil in semi-open or closed, diverse montane mesic forest dominated by *Acacia koa* and/or *Metrosideros polymorpha*. This unit is geographically separated from the other two units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 10—*Dubautia pauciflora*—a

This unit is critical habitat for *Dubautia pauciflora* and is 814 ha (2,012 ac) on State (Lihue-Koloa Forest Reserve) and private land. This unit

contains portions of Iole and Kahili Summits. This unit provides habitat for four populations of 250 mature, reproducing individuals of the short-lived perennial *Dubautia pauciflora* and is currently occupied with 42 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, stream drainages containing *Metrosideros polymorpha*-*Dicranopteris linearis* lowland wet forest. 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 species, this unit is an appropriate size so that each potential recovery population on Kauai within the unit is geographically separated enough to avoid their destruction by one naturally occurring catastrophic event.

Kauai 11—*Euphorbia haeleeleana*—a

This unit is critical habitat for *Euphorbia haeleeleana* and is 262 ha (649 ac) on State land (Kuia NAR). This unit contains portions of Milolii Ridge and Mahanaloa Valley. This unit provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *Euphorbia haeleeleana* and is currently occupied with between 355 and 405 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, lowland mixed mesic or dry *Diospyros* forest that is often co-dominated by *Metrosideros polymorpha* and *Alphitonia ponderosa*. This unit provides for two populations within this multi-island species' historical range on Kauai that are 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.

Kauai 11—*Euphorbia haeleeleana*—b

This unit is critical habitat for *Euphorbia haeleeleana* and is 193 ha (476 ac) on State land (Na Pali Coast

State Park) within Kalalau Valley. This unit provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *Euphorbia haeleeleana* and is currently occupied with over 120 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. It provides habitat for the westernmost range of the species that is unique to Kauai. The habitat features contained in this unit that are essential for this species include, but are not limited to, lowland mixed mesic or dry *Diospyros* forest that is often co-dominated by *Metrosideros polymorpha* and *Alphitonia ponderosa*. This unit provides for two populations within this multi-island species' historical range on Kauai that are 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.

Kauai 11—*Euphorbia haeleeleana*—c

This unit is critical habitat for *Euphorbia haeleeleana* and is 204 ha (505 ac) on State land, containing portions of Kawaiiki Valley. This unit provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *Euphorbia haeleeleana* and is currently occupied with two plants. This unit is important to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. It provides habitat for the westernmost range of the species that is unique to Kauai. The habitat features contained in this unit that are essential for this species include, but are not limited to, lowland mixed mesic or dry *Diospyros* forest that is often co-dominated by *Metrosideros polymorpha* and *Alphitonia ponderosa*. This unit provides for two populations within this multi-island species' historical range on Kauai that are 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.

Kauai 10—*Exocarpos luteolus*—a

This unit is critical habitat for *Exocarpos luteolus* and is 401 ha (990 ac) on State (Lihue-Koloa Forest Reserve) and private land. This unit contains Kahili Summit and Kanaele

Swamp. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Exocarpos luteolus* and is currently occupied with three plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, wet places bordering swamps or bogs; open or dry ridges in lowland or montane mesic *Acacia koa*-*Metrosideros polymorpha*-dominated forest communities with *Dicranopteris*. This unit is geographically separated from the other four units designated as critical habitat for this island-endemic species to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Exocarpos luteolus*—b

This unit is critical habitat for *Exocarpos luteolus* and is 3,800 ha (9,389 ac) on State (Alakai Wilderness Preserve, Halelea Forest Reserve, and Hono o Na Pali NAR) and private land. This unit contains the Alakai Swamp and Trail, Halehaha and Halepaakai Streams, Kaluahaula Ridge, and Kapoki, Kilohana, Koali, and Pihea Summits. This unit provides habitat for four populations of 300 mature, reproducing individuals of the short-lived perennial *Exocarpos luteolus* and is currently occupied with 19 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, wet places bordering swamps or bogs; open or dry ridges in lowland or montane mesic *Acacia koa*-*Metrosideros polymorpha*-dominated forest communities with *Dicranopteris*. This unit is geographically separated from the other four units designated as critical habitat for this island-endemic species to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Exocarpos luteolus*—c

This unit is critical habitat for *Exocarpos luteolus* and is 176 ha (438 ac) on State land (Kokee and Na Pali Coast State Parks) within Kalalau Valley. This unit provides habitat for one population of 300 mature,

reproducing individuals of the short-lived perennial *Exocarpos luteolus* and is currently occupied with over 40 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, wet places bordering swamps or bogs; open or dry ridges in lowland or montane mesic *Acacia koa*-*Metrosideros polymorpha*-dominated forest communities with *Dicranopteris*. This unit is geographically separated from the other four units designated as critical habitat for this island-endemic species to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Exocarpos luteolus*—d

This unit is critical habitat for *Exocarpos luteolus* and is 83 ha (206 ac) on State land (Kokee State Park) on Kamuela Ridge. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Exocarpos luteolus* and is currently occupied with between five and seven plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, wet places bordering swamps or bogs; open or dry ridges in lowland or montane mesic *Acacia koa*-*Metrosideros polymorpha*-dominated forest communities with *Dicranopteris*. This unit is geographically separated from the other four units designated as critical habitat for this island-endemic species to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Exocarpos luteolus*—e

This unit is critical habitat for *Exocarpos luteolus* and is 522 ha (1,290 ac) on State land (Kuiia NAR, Kokee and Na Pali Coast State Parks). This unit contains Awaawapuhi, Honopu, and Nualolo Trails, and Kainamanu and Kalahu Summits. This unit provides habitat for three populations of 300 mature, reproducing individuals of the short-lived perennial *Exocarpos luteolus* and is currently occupied with six plants. This unit is essential to the conservation of the taxon because it

supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, wet places bordering swamps or bogs; open or dry ridges in lowland or montane mesic *Acacia koa*-*Metrosideros polymorpha*-dominated forest communities with *Dicranopteris*. This unit is geographically separated from the other four units designated as critical habitat for this island-endemic species to avoid all recovery populations from being destroyed by one naturally occurring catastrophic event.

Kauai 11—*Flueggea neowawraea*—a

This unit is critical habitat for *Flueggea neowawraea* and is 51 ha (126 ac) on State land (Na Pali Coast State Park) within Kalalau Valley. This unit, in combination with units 11—*Flueggea neowawraea*—b and 11—*Flueggea neowawraea*—e, provides habitat for one population of 100 mature, reproducing individuals of the long-lived perennial *Flueggea neowawraea* and is currently unoccupied. This unit is essential to the conservation of the taxon because it supports habitat that is essential to the establishment of additional populations on Kauai in order to reach recovery goals. It provides habitat for the westernmost range of the species. The habitat features contained in this unit that are essential for this species include, but are not limited to, dry or mesic forests. This unit together with the two other units, provides for one population within this multi-island species' historical range on Kauai that 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.

Kauai 11—*Flueggea neowawraea*—b

This unit is critical habitat for *Flueggea neowawraea* and is 48 ha (117 ac) on State land (Na Pali Coast State Park) within Kalalau Valley. This unit, in combination with units 11—*Flueggea neowawraea*—a and 11—*Flueggea neowawraea*—e, provides habitat for one population of 100 mature, reproducing individuals of the long-lived perennial *Flueggea neowawraea* and is currently occupied with one plant. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently

considered non-viable. It provides habitat for the westernmost range of the species. The habitat features contained in this unit that are essential for this species include, but are not limited to, dry or mesic forests. This unit together with the two other units, provides for one population within this multi-island species' historical range on Kauai that 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.

Kauai 11—*Flueggea neowawraea*—c

This unit is critical habitat for *Flueggea neowawraea* and is 152 ha (376 ac) on State land (Alakai Wilderness Preserve), containing portions of Kawaiiki Valley. This unit provides habitat for one population of 100 mature, reproducing individuals of the long-lived perennial *Flueggea neowawraea* and is currently occupied with 30 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. It provides habitat for the westernmost range of the species. The habitat features contained in this unit that are essential for this species include, but are not limited to, dry or mesic forests. This unit provides for one population within this multi-island species' historical range on Kauai that 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.

Kauai 11—*Flueggea neowawraea*—d

This unit is critical habitat for *Flueggea neowawraea* and is 77 ha (191 ac) on State land (Hono o Na Pali NAR and Na Pali Coast State Park). This unit contains Puu Ki Summit and Kaalahina Ridge. This unit provides habitat for one population of 100 mature, reproducing individuals of the long-lived perennial *Flueggea neowawraea* and is currently occupied with nine plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. It provides habitat for the westernmost range of the species. The habitat features contained in this unit that are essential for this species include, but are not limited to, dry or mesic forests. This unit provides for one population within this multi-island

species' historical range on Kauai that 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.

Kauai 11—*Flueggea neowawraea*—e

This unit is critical habitat for *Flueggea neowawraea* and is 27 ha (67 ac) on State land (Na Pali Coast State Park) within Kalalau Valley. This unit, in combination with units 11—*Flueggea neowawraea*—a and 11—*Flueggea neowawraea*—b, provides habitat for one population of 100 mature, reproducing individuals of the long-lived perennial *Flueggea neowawraea* and is currently occupied with one plant. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. It provides habitat for the westernmost range of the species. The habitat features contained in this unit that are essential for this species include, but are not limited to, dry or mesic forests. This unit together with the two other units, provides for one population within this multi-island species' historical range on Kauai that 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.

Kauai 11—*Flueggea neowawraea*—f

This unit is critical habitat for *Flueggea neowawraea* and is 240 ha (594 ac) on State land (Kuia NAR). This unit contains portions of Milolii Ridge, and Kuia and Mahanaloa Valleys. This unit provides habitat for one population of 100 mature, reproducing individuals of the long-lived perennial *Flueggea neowawraea* and is currently occupied with four plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. It provides habitat for the westernmost range of the species. The habitat features contained in this unit that are essential for this species include, but are not limited to, dry or mesic forests. This unit provides for one population within this multi-island species' historical range on Kauai that 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.

Kauai 11—*Gouania meyenii*—a

This unit is critical habitat for *Gouania meyenii* and is 442 ha (1,094 ac) on State land (Kuia NAR), and containing portions of Mahanaloa Valley. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Gouania meyenii* and is currently unoccupied. This unit is essential to the conservation of the taxon because it supports habitat that is important to the establishment of additional populations on Kauai in order to reach recovery goals. It provides habitat for the westernmost range of the species that is unique to Kauai. The habitat features contained in this unit that are essential for this species include, but are not limited to, rocky ledges, cliff faces, and ridge-tops in dry shrubland or *Metrosideros polymorpha* lowland diverse mesic forest. This unit provides for one population within this multi-island species' historical range on Kauai that 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.

Kauai 11—*Gouania meyenii*—b

This unit is critical habitat for *Gouania meyenii* and is 128 ha (316 ac) on State land (Na Pali Coast State Park) within Kalalau Valley. This unit provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *Gouania meyenii* and is currently occupied with eight plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. It provides habitat for the westernmost range of the species that is unique to Kauai. The habitat features contained in this unit that are essential for this species include, but are not limited to, rocky ledges, cliff faces, and ridge-tops in dry shrubland or *Metrosideros polymorpha* lowland diverse mesic forest. This unit provides for two populations within this multi-island species' historical range on Kauai that are 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.

Kauai 11—*Gouania meyenii*—c

This unit is critical habitat for *Gouania meyenii* and is 215 ha (532 ac)

on State land, and containing portions of Kawaiiki Valley. This unit provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *Gouania meyenii* and is currently unoccupied. This unit is essential to the conservation of the taxon because it supports habitat that is important to the establishment of additional populations on Kauai in order to reach recovery goals. It provides habitat for the westernmost range of the species that is unique to Kauai. The habitat features contained in this unit that are essential for this species include, but are not limited to, rocky ledges, cliff faces, and ridge-tops in dry shrubland or *Metrosideros polymorpha* lowland diverse mesic forest. This unit provides for two populations within this multi-island species' historical range on Kauai that are 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.

Kauai 11—*Hedyotis cookiana*—a

This unit is critical habitat for *Hedyotis cookiana* and is 772 ha (1,907 ac) on State land (Hono o Na Pali NAR and Na Pali Coast State Park). This unit contains Kanakau Summit. This unit provides habitat for seven populations of 300 mature, reproducing individuals of the short-lived perennial *Hedyotis cookiana* and is currently occupied with between 60 and 80 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, streambeds or steep cliffs close to water sources in relict *Metrosideros polymorpha* low mesic and low wet forest communities. 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 species, this unit is of appropriate size so that each potential recovery population on Kauai within the unit is geographically separated enough to avoid their destruction by one naturally occurring catastrophic event.

Kauai 11—*Hedyotis st.-johnii*—a

This unit is critical habitat for *Hedyotis st.-johnii* and is 238 ha (589 ac) on State land (Hono o Na Pali NAR, Na Pali Coast State Park, and Puu Ka Pele Forest Reserve) Makaha point to Waiahuakua Valley. This unit provides

habitat for seven populations of 300 mature, reproducing individuals of the short-lived perennial *Hedyotis st.-johnii* and is currently occupied with between 227 and 292 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, crevices of north-facing, near-vertical coastal cliff faces within the spray zone in sparse dry coastal shrubland.

Kauai 10—*Hesperomannia lydgatei*—a

This unit is critical habitat for *Hesperomannia lydgatei* and is 646 ha (1,596 ac) on private land, containing Hulua Summit. This unit provides habitat for two populations of 250 mature, reproducing individuals of the long-lived perennial *Hesperomannia lydgatei* and is currently occupied with 296 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, stream banks and forested slopes with rich brown soil and silty clay in *Metrosideros polymorpha* or *Metrosideros polymorpha-Dicranopteris linearis* lowland wet forest. This unit is geographically separated from the other two units designated as critical habitat for this island-endemic species to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Hesperomannia lydgatei*—b

This unit is critical habitat for *Hesperomannia lydgatei* and is 914 ha (2,258 ac) on State (Halelea Forest Reserve) and private land. This unit contains portions of the Namolokama Mountains and Kaliko Summit. This unit provides habitat for two populations of 250 mature, reproducing individuals of the long-lived perennial *Hesperomannia lydgatei* and is currently occupied with one plant. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this

species include, but are not limited to, stream banks and forested slopes with rich brown soil and silty clay in *Metrosideros polymorpha* or *Metrosideros polymorpha-Dicranopteris linearis* lowland wet forest. This unit is geographically separated from the other two units designated as critical habitat for this island-endemic species to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Hesperomannia lydgatei*—c

This unit is critical habitat for *Hesperomannia lydgatei* and is 180 ha (445 ac) on State and private land, containing Hono o Na Pali Summit. This unit provides habitat for one population of 250 mature, reproducing individuals of the long-lived perennial *Hesperomannia lydgatei* and is currently occupied with one plant. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, stream banks and forested slopes with rich brown soil and silty clay in *Metrosideros polymorpha* or *Metrosideros polymorpha-Dicranopteris linearis* lowland wet forest. This unit is geographically separated from the other two units designated as critical habitat for this island-endemic species to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Hibiscadelphus woodii*—a

This unit is critical habitat for *Hibiscadelphus woodii* and is 278 ha (687 ac) on State land (Hono o Na Pali NAR and Na Pali Coast State Park). This unit contains portions of Kaaalahina and Manono Ridges and Puu Ki Summit. This unit provides habitat for three populations of 100 mature, reproducing individuals of the long-lived perennial *Hibiscadelphus woodii* and is currently unoccupied. This unit is essential to the conservation of the taxon because it supports habitat that is important to the establishment of additional populations on Kauai 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, basalt talus or cliff walls in *Metrosideros polymorpha* montane mesic forest. This unit is geographically separated from the other unit designated as critical habitat for this island-endemic species

to avoid all recovery populations from being destroyed by one naturally occurring catastrophe. 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 species, this unit is of appropriate size and distance from the other unit to avoid their destruction by one naturally occurring catastrophic event.

Kauai 11—*Hibiscadelphus woodii*—b

This unit is critical habitat for *Hibiscadelphus woodii* and is 72 ha (177 ac) on State land (Halelea Forest Reserve, Hono o Na Pali NAR, and Na Pali Coast State Park). This unit contains Kalahu Summit. This unit provides habitat for two populations of 100 mature, reproducing individuals of the long-lived perennial *Hibiscadelphus woodii* and is currently occupied with six plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, basalt talus or cliff walls in *Metrosideros polymorpha* montane mesic forest. This unit is geographically separated from the other unit designated as critical habitat for this island-endemic species to avoid all recovery populations from being destroyed by one naturally occurring catastrophe. 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 species, this unit is of appropriate size and distance from the other unit to avoid their destruction by one naturally occurring catastrophic event.

Kauai 4—*Hibiscus clayi*—a

This unit is critical habitat for *Hibiscus clayi* and is 4 ha (9 ac) on private land near Puu Eu. This unit, in combination with unit 4—*Hibiscus clayi*—d, provides habitat for one population of 100 mature, reproducing individuals of the long-lived perennial *Hibiscus clayi* and is currently unoccupied. This unit is essential to the conservation of the taxon because it supports habitat that is essential to the establishment of additional populations on Kauai 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, slopes in *Acacia koa* or *Diospyros* spp.-*Pisonia* spp.-*Metrosideros polymorpha* lowland dry or mesic forest. This unit is geographically separated from other

critical habitat for this island-endemic species to avoid all recovery populations from being destroyed by one naturally occurring catastrophe. 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 species, this unit is of an appropriate distance from the other units to avoid their destruction by one naturally occurring catastrophic event.

Kauai 4—*Hibiscus clayi*—b

This unit is critical habitat for *Hibiscus clayi* and is 85 ha (210 ac) on private land on the northeast side of Makaleha Mountain. This unit, in combination with 4—*Hibiscus clayi*—e, provides habitat for one population of 100 mature, reproducing individuals of the long-lived perennial *Hibiscus clayi* and is currently unoccupied. This unit is important to the conservation of the taxon because it supports habitat that is important to the establishment of additional populations on Kauai 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, slopes in *Acacia koa* or *Diospyros* spp.-*Pisonia* spp.-*Metrosideros polymorpha* lowland dry or mesic forest. This unit is geographically separated from other critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe. 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 species, this unit is of an appropriate distance from the other units so that each potential recovery population on Kauai within the unit is geographically separated enough to avoid their destruction by one naturally occurring catastrophic event.

Kauai 4—*Hibiscus clayi*—c

This unit is critical habitat for *Hibiscus clayi* and is 590 ha (1,455 ac) on State (Kealia and Moloaa Forest Reserves) and private land. This unit contains Leleiwi and Puu Awa Summits. This unit provides habitat for three populations of 100 mature, reproducing individuals of the long-lived perennial *Hibiscus clayi* and is currently unoccupied. This unit is essential to the conservation of the taxon because it supports habitat that is important to the establishment of additional populations on Kauai 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, slopes in

Acacia koa or *Diospyros* spp.-*Pisonia* spp.-*Metrosideros polymorpha* lowland dry or mesic forest. 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 species, this unit is of an appropriate distance from the other units to avoid their destruction by one naturally occurring catastrophic event.

Kauai 4—*Hibiscus clayi*—d

This unit is critical habitat for *Hibiscus clayi* and is 48 ha (119 ac) on private land. This unit contains Leleiwi and a portion of the northwest side of Makaleha Mountain. This unit, in combination with unit 4—*Hibiscus clayi*—a, provides habitat for one population of 100 mature, reproducing individuals of the long-lived perennial *Hibiscus clayi* and is currently unoccupied. This unit is important to the conservation of the taxon because it supports habitat that is important to the establishment of additional populations on Kauai 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, slopes in *Acacia koa* or *Diospyros* spp.-*Pisonia* spp.-*Metrosideros polymorpha* lowland dry or mesic forest. This unit is geographically separated from other critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe. 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 species, this unit is of an appropriate distance from other units to avoid their destruction by one naturally occurring catastrophic event.

Kauai 4—*Hibiscus clayi*—e

This unit is critical habitat for *Hibiscus clayi* and is 19 ha (47 ac) on State land (Kealia Forest Reserve) at the headwaters of Makaleha Stream. This unit, in combination with unit 4—*Hibiscus clayi*—b, provides habitat for one population of 100 mature, reproducing individuals of the long-lived perennial *Hibiscus clayi* and is currently unoccupied. This unit is important to the conservation of the taxon because it supports habitat that is important to the establishment of additional populations on Kauai 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, slopes in *Acacia koa* or *Diospyros* spp.-*Pisonia* spp.-*Metrosideros polymorpha* lowland dry or mesic forest. This unit is geographically separated from other

critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe. 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 species, this unit is of an appropriate distance from other units to avoid their destruction by one naturally occurring catastrophic event.

Kauai 5—*Hibiscus clayi*—f

This unit is critical habitat for *Hibiscus clayi* and is 60 ha (148 ac) on State land (Nonou Forest Reserve), containing portions of the Nonou Mountains. This unit provides habitat for one population of 100 mature, reproducing individuals of the long-lived perennial *Hibiscus clayi* and is currently occupied with four plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, slopes in *Acacia koa* or *Diospyros* spp.-*Pisonia* spp.-*Metrosideros polymorpha* lowland dry or mesic forest. This unit is geographically separated from the other five units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe. 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 species, this unit is of an appropriate distance from the other units to avoid their destruction by one naturally occurring catastrophic event.

Kauai 11—*Hibiscus waimeae* ssp. *hannerae*—a

This unit is critical habitat for *Hibiscus waimeae* ssp. *hannerae* and is 1,120 ha (2,769 ac) on State (Halelea Forest Reserve, Hono o Na Pali NAR, Haena and Na Pali Coast State Parks) and private land. This unit contains Limahuli Falls and Kulanaaililia, Maunapuluo, and Pali Elelee Summits. This unit provides habitat for eight populations of 100 mature, reproducing individuals of the long-lived perennial *Hibiscus waimeae* ssp. *hannerae* and is currently occupied with 25 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population,

which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, *Metrosideros polymorpha*-*Dicranopteris linearis* or *Pisonia* spp.-*Charpentiera elliptica* lowland wet or mesic forest.

Kauai 1—*Ischaemum byrhone*—a

This unit is critical habitat for *Ischaemum byrhone* and is 0.4 ha (1 ac) on private land at Hanalei Point. This unit, in combination with unit 1—*Ischaemum byrhone*—b, provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Ischaemum byrhone* and is currently occupied with one plant. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. It provides habitat for the westernmost range of the species. The habitat features contained in this unit that are essential for this species include, but are not limited to, coastal shrubland near the ocean among rocks and seepy cliffs. This unit, together with the other unit, provides for one population within this multi-island species' historical range on Kauai that 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.

Kauai 2—*Ischaemum byrhone*—b

This unit is critical habitat for *Ischaemum byrhone* and is 6 ha (15 ac) on private land, containing Kaweonui Point. This unit, in combination with unit 1—*Ischaemum byrhone*—a, provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Ischaemum byrhone* and is currently unoccupied. This unit is essential to the conservation of the taxon because it supports habitat that is important to the establishment of additional populations on Kauai in order to reach recovery goals. It provides habitat for the westernmost range of the species. The habitat features contained in this unit that are essential for this species include, but are not limited to, coastal shrubland near the ocean among rocks and seepy cliffs. This unit, together with the other unit, provides for one population within this multi-island species' historical range on Kauai that 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.

Kauai 3—*Ischaemum byrone*—c

This unit is critical habitat for *Ischaemum byrone* and is 6 ha (16 ac) on private land along the cliffs of Kauapea Beach. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Ischaemum byrone* and is currently occupied with one plant. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. It provides habitat for the westernmost range of the species. The habitat features contained in this unit that are essential for this species include, but are not limited to, coastal shrubland near the ocean among rocks and seepy cliffs. This unit provides for one population within this multi-island species' historical range on Kauai that 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.

Kauai 11—*Ischaemum byrone*—d

This unit is critical habitat for *Ischaemum byrone* and is 45 ha (111 ac) on State land (Hono o Na Pali NAR and Na Pali Coast State Park). This unit contains portions of Hanakapiai Beach, Hoolulu and Hanakapiai Streams. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Ischaemum byrone* and is currently unoccupied. This unit is important to the conservation of the taxon because it supports habitat that is important to the establishment of additional populations on Kauai in order to reach recovery goals. It provides habitat for the westernmost range of the species. The habitat features contained in this unit that are essential for this species include, but are not limited to, coastal shrubland near the ocean among rocks and seepy cliffs. This unit provides for one population within this multi-island species' historical range on Kauai that 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.

Kauai 11—*Isodendron laurifolium*—a

This unit is critical habitat for *Isodendron laurifolium* and is 401 ha (991 ac) on State land (Kuia NAR). This

unit contains portions of Mahanaloa Valley and Milolii Ridge. This unit provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *Isodendron laurifolium* and is currently occupied with between 86 and 96 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. It provides habitat for the westernmost range of the species that is unique to Kauai. The habitat features contained in this unit that are essential for this species include, but are not limited to, diverse mesic forest dominated by *Metrosideros polymorpha*, *Acacia koa* or *Diospyros* spp. This unit provides for two populations within this multi-island species' historical range on Kauai that are 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.

Kauai 11—*Isodendron laurifolium*—b

This unit is critical habitat for *Isodendron laurifolium* and is 400 ha (988 ac) on State land (Alakai Wilderness Preserve) containing portions of Kawaiiki Valley. This unit provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *Isodendron laurifolium* and is currently occupied with between six and eight plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. It provides habitat for the westernmost range of the species that is unique to Kauai. The habitat features contained in this unit that are essential for this species include, but are not limited to, diverse mesic forest dominated by *Metrosideros polymorpha*, *Acacia koa* or *Diospyros* spp. This unit provides for two populations within this multi-island species' historical range on Kauai that are 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.

Kauai 7—*Isodendron longifolium*—a

This unit is critical habitat for *Isodendron longifolium* and is 338 ha (833 ac) on private land. This unit contains Hokulei Peak, Haupū and

Naluakeina Summits, and Queen Victoria's Profile. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Isodendron longifolium* and is currently occupied with two plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. It provides habitat for the westernmost range of the species. The habitat features contained in this unit that are essential for this species include, but are not limited to, steep slopes, gulches, or stream banks and flats in undisturbed areas, in mesic or wet *Metrosideros polymorpha*-*Acacia koa* forests. This unit provides for one population within this multi-island species' historical range on Kauai that 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.

Kauai 10—*Isodendron longifolium*—b

This unit is critical habitat for *Isodendron longifolium* and is 142 ha (350 ac) on private land containing Hulua Summit. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Isodendron longifolium* and is currently occupied with between 83 and 103 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. It provides habitat for the westernmost range of the species. The habitat features contained in this unit that are essential for this species include, but are not limited to, steep slopes, gulches, or stream banks and flats in undisturbed areas, in mesic or wet *Metrosideros polymorpha*-*Acacia koa* forests. This unit provides for one population within this multi-island species' historical range on Kauai that 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.

Kauai 11—*Isodendron longifolium*—c

This unit is critical habitat for *Isodendron longifolium* and is 59 ha (145 ac) on State land (Kokee and Na Pali Coast State Parks), containing Kainamanu Summit. This unit provides habitat for one population of 300

mature, reproducing individuals of the short-lived perennial *Isodendron longifolium* and is currently occupied with 20 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. It provides habitat for the westernmost range of the species. The habitat features contained in this unit that are essential for this species include, but are not limited to, steep slopes, gulches, or stream banks and flats in undisturbed areas, in mesic or wet *Metrosideros polymorpha-Acacia koa* forests. This unit provides for one population within this multi-island species' historical range on Kauai that 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.

Kauai 11—*Isodendron longifolium*—d

This unit is critical habitat for *Isodendron longifolium* and is 494 ha (1,219 ac) on State land (Halelea Forest Reserve). This unit contains Kaliko and Puu Manu Summit. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Isodendron longifolium* and is currently occupied with between 80 and 90 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. It provides habitat for the westernmost range of the species. The habitat features contained in this unit that are essential for this species include, but are not limited to, steep slopes, gulches, or stream banks and flats in undisturbed areas, in mesic or wet *Metrosideros polymorpha-Acacia koa* forests. This unit provides for one population within this multi-island species' historical range on Kauai that 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.

Kauai 11—*Isodendron longifolium*—e

This unit is critical habitat for *Isodendron longifolium* and is 381 ha (941 ac) on State (Halelea Forest Reserve, Hono o Na Pali NAR, and Na Pali Coast State Park) and private land. This unit contains Pohahea Summit. This unit provides habitat for two populations of 300 mature, reproducing

individuals of the short-lived perennial *Isodendron longifolium* and is currently occupied with 424 plants. This unit is essential to the conservation of the taxon because it supports extant colonies of this species and includes habitat that is important for the expansion of the present populations, which are currently considered non-viable. It provides habitat for the westernmost range of the species. The habitat features contained in this unit that are essential for this species include, but are not limited to, steep slopes and some flats in certain undisturbed areas, gulches, or stream banks in mesic or wet *Metrosideros polymorpha-Acacia koa* forests. This unit provides for two populations within this multi-island species' historical range on Kauai that are 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.

Kauai 11—*Kokia kauaiensis*—a

This unit is critical habitat for *Kokia kauaiensis* and is 155 ha (384 ac) on State land (Alakai Wilderness Preserve). This unit contains portions of Kawaiiki and Kipalau Valleys. This unit provides habitat for three populations of 100 mature, reproducing individuals of the long-lived perennial *Kokia kauaiensis* and is currently occupied with 70 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, diverse mesic forest. This unit is geographically separated from the other three units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Kokia kauaiensis*—b

This unit is critical habitat for *Kokia kauaiensis* and is 30 ha (74 ac) on State land (Na Pali Coast State Park) within Pohakuau Valley. This unit provides habitat for one population of 100 mature, reproducing individuals of the long-lived perennial *Kokia kauaiensis* and is currently occupied with two plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently

considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, diverse mesic forest. This unit is geographically separated from the other three units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Kokia kauaiensis*—c

This unit is critical habitat for *Kokia kauaiensis* and is 666 ha (1,648 ac) on State land (Kuia NAR). This unit contains portions of Milolii Ridge, Kuia and Mahanaloa Valleys. This unit provides habitat for two populations of 100 mature, reproducing individuals of the long-lived perennial *Kokia kauaiensis* and is currently occupied with between 78 and 83 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, diverse mesic forest. This unit is geographically separated from the other three units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Kokia kauaiensis*—d

This unit is critical habitat for *Kokia kauaiensis* and is 127 ha (313 ac) on State land (Na Pali Coast State Park) within Kalalau Valley. This unit provides habitat for two populations of 100 mature, reproducing individuals of the long-lived perennial *Kokia kauaiensis* and is currently occupied with 16 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, diverse mesic forest. This unit is geographically separated from the other three units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 4—*Labordia lydgatei*—a

This unit is critical habitat for *Labordia lydgatei* and is 587 ha (1,455 ac) on State (Kealia and Moloaa Forest

Reserves) and private land. This unit contains Kekoiki, Leleiwi, Namahana, and Puu Awa Summits. This unit provides habitat for one population of 250 mature, reproducing individuals of the short-lived perennial *Labordia lydgatei* and is currently occupied with one plant. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, stream banks in *Metrosideros polymorpha-Dicranopteris linearis* forest. This unit is geographically separated from the other four units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 10—*Labordia lydgatei*—b

This unit is critical habitat for *Labordia lydgatei* and is 1,035 ha (2,558 ac) on State (Lihue-Koloa Forest Reserve) and private land. This unit contains Hulua, Iole, Kahile, and Pilikea Summits. This unit provides habitat for two populations of 250 mature, reproducing individuals of the short-lived perennial *Labordia lydgatei* and is currently occupied with five plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, stream banks in *Metrosideros polymorpha-Dicranopteris linearis* forest. This unit is geographically separated from the other four units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Labordia lydgatei*—c

This unit is critical habitat for *Labordia lydgatei* and is 325 ha (804 ac) on private land within Lumahai Valley. This unit provides habitat for one population of 250 mature, reproducing individuals of the short-lived perennial *Labordia lydgatei* and is currently occupied with seven plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the

expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, stream banks in *Metrosideros polymorpha-Dicranopteris linearis* forest. This unit is geographically separated from the other four units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Labordia lydgatei*—d

This unit is critical habitat for *Labordia lydgatei* and is 82 ha (204 ac) on State land (Halelea Forest Reserve). This unit contains portions of Waioli Valley and Waiopa Summit. This unit provides habitat for one population of 250 mature, reproducing individuals of the short-lived perennial *Labordia lydgatei* and is currently occupied with two plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, stream banks in *Metrosideros polymorpha-Dicranopteris linearis* forest. This unit is geographically separated from the other four units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Labordia lydgatei*—e

This unit is critical habitat for *Labordia lydgatei* and is 119 ha (291 ac) on State (Halelea Forest Reserve, Hono o Na Pali NAR, and Na Pali Coast State Park) and private land. This unit contains Hono O Na Pali and Pali Elele Summits. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Labordia lydgatei* and is currently occupied with two plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, stream banks in *Metrosideros polymorpha-Dicranopteris linearis* forest. This unit is geographically separated from the other four units

designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 10—*Labordia tinifolia* var. *wahiawaensis*—a

This unit is critical habitat for *Labordia tinifolia* var. *wahiawaensis* and is 912 ha (2,255 ac) on private land. This unit contains Hulua, Iole, Kahili, Kapalaoa, and Palikea Summits. This unit provides habitat for four populations of 100 mature, reproducing individuals of the long-lived perennial *Labordia tinifolia* var. *wahiawaensis* and is currently occupied with 20 to 30 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, stream banks in lowland wet forest. 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 species, this unit is of appropriate size so that each potential recovery population on Kauai within the unit is geographically separated enough to avoid their destruction by one naturally occurring catastrophic event.

Kauai 11—*Lipochaeta fauriei*—a

This unit is critical habitat for *Lipochaeta fauriei* and is 106 ha (262 ac) on State land (Alakai Wilderness Preserve), containing portions of Kipalau Valley. This unit provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *Lipochaeta fauriei* and is currently unoccupied. This unit is essential to the conservation of the taxon because it supports habitat that is important to the establishment of additional populations on Kauai 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, sides of steep gulches in diverse mesic forests. This unit is geographically separated from the other unit designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe. 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 species, this unit is at an appropriate distance from the

other unit to avoid their destruction by one naturally occurring catastrophic event.

Kauai 11—*Lipochaeta fauriei*—b

This unit is critical habitat for *Lipochaeta fauriei* and is 545 ha (1,347 ac) on State land (Kuia NAR). This unit contains portions of Mahanaloa and Kuia Valleys. This unit provides habitat for four populations of 300 mature, reproducing individuals of the short-lived perennial *Lipochaeta fauriei* and is currently occupied with 70 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, sides of steep gulches in diverse mesic forests. This unit is geographically separated from the other unit designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe. 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 species, this unit is at an appropriate distance from the other unit to avoid their destruction by one naturally occurring catastrophic event.

Kauai 7—*Lipochaeta micrantha*—a

This unit is critical habitat for *Lipochaeta micrantha* and is 340 ha (843 ac) on private land. This unit contains Hokulei Peak, Haupu and Naluakeina Summits, and Queen Victoria's Profile. This unit provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *Lipochaeta micrantha* and is currently occupied with 50 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, cliffs, ridges, stream banks, or slopes in mesic to wet mixed communities. This unit is geographically separated from the other unit designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe. 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 species, this unit is at an appropriate distance from the other unit to avoid their destruction by one naturally occurring catastrophic event.

Kauai 11—*Lipochaeta micrantha*—b

This unit is critical habitat for *Lipochaeta micrantha* and is 212 ha (523 ac) on State land, containing portions of Kaluahaulu Ridge. This unit provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *Lipochaeta micrantha* and is currently occupied with at least one plant. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, cliffs, ridges, stream banks, or slopes in mesic to wet mixed communities. This unit is geographically separated from the other unit designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe. 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 species, this unit is at an appropriate distance from the other unit to avoid their destruction by one naturally occurring catastrophic event.

Kauai 13—*Lipochaeta waimeaensis*—a

This unit is critical habitat for *Lipochaeta waimeaensis* and is 56 ha (139 ac) on State land, containing portions of Waimea Canyon. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Lipochaeta waimeaensis* and is currently occupied with at least 100 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, precipitous, shrub-covered gulches in diverse lowland forest. Although there may not be sufficient habitat designated to reach the recovery goal of 8 to 10 populations, this species is a very narrow endemic and may never

naturally occurred in more than a single or a few populations.

Kauai 11—*Lobelia niihauensis*—a

This unit is critical habitat for *Lobelia niihauensis* and is 89 ha (220 ac) on State land (Alakai Wilderness Preserve), containing portions of Kipalau Valley. This unit provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *Lobelia niihauensis* and is currently unoccupied. This unit is essential to the conservation of the taxon because it supports habitat that is important to the establishment of additional populations on Kauai in order to reach recovery goals. It provides habitat for the westernmost range of the species that is unique to Kauai. The habitat features contained in this unit that are essential for this species include, but are not limited to, exposed mesic mixed shrubland or coastal dry cliffs. This unit provides for two populations within this multi-island species' historical range on Kauai that are 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.

Kauai 11—*Lobelia niihauensis*—b

This unit is critical habitat for *Lobelia niihauensis* and is 2,003 ha (4,950 ac) on State (Haena State Park and Hono o Na Pali NAR) and private land. This unit contains Hanakapiai, Hanakoa, Kalalau, and Limahuli Valleys, Kaaalahina and Manono Ridges, Kanakou and Makana Summits, Hoolau and Waiahuakua Streams. This unit provides habitat for five populations of 300 mature, reproducing individuals of the short-lived perennial *Lobelia niihauensis* and is currently occupied with 168 to 1,108 plants. This unit is important to the conservation of the taxon because it supports an extant colony of this species. It provides habitat for the westernmost range of the species that is unique to Kauai. The habitat features contained in this unit that are essential for this species include, but are not limited to, exposed mesic mixed shrubland or coastal dry cliffs. This unit provides for five populations within this multi-island species' historical range on Kauai that are 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.

Kauai 10—*Lysimachia filifolia*—a

This unit is critical habitat for *Lysimachia filifolia* and is 995 ha (2,458

ac) on State (Lihue-Koloa Forest Reserve) and private land. This unit contains Iole, Kalalea, Kamanu, and Palikea Summits. This unit provides habitat for four populations of 300 mature, reproducing individuals of the short-lived perennial *Lysimachia filifolia* and is currently occupied with 20 to 75 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. It provides habitat for the westernmost range of the species. The habitat features contained in this unit that are essential for this species include, but are not limited to, mossy banks at the base of cliff faces within the spray zone of waterfalls or along streams in lowland wet forests. This unit provides for four populations within this multi-island species' historical range on Kauai that are 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.

Kauai 11—*Mariscus pennatiformis*—a

This unit is critical habitat for *Mariscus pennatiformis* and is 1,003 ha (2,479 ac) on State land (Kuia NAR, Kokee and Waimea Canyon State Parks). This unit contains portions of Milolii Ridge and Nualolo Trail. This unit provides habitat for three populations of 300 mature, reproducing individuals of the short-lived perennial *Mariscus pennatiformis* and is currently unoccupied. This unit is essential to the conservation of the taxon because it supports habitat that is important to the establishment of additional populations on Kauai in order to reach recovery goals. It provides habitat for the westernmost range of the species that is unique to Kauai. The habitat features contained in this unit that are essential for this species include, but are not limited to, open sites in *Metrosideros polymorpha*-*Acacia koa* mixed mesic forest. This unit provides for three populations within this multi-island species' historical range on Kauai that are 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.

Kauai 7—*Melicope haupuensis*—a

This unit is critical habitat for *Melicope haupuensis* and is 330 ha (816 ac) on private land. This unit contains Hokulei Peak, Haupu and Naluakeina Summits, and Queen Victoria's Profile.

This unit provides habitat for two populations of 100 mature, reproducing individuals of the long-lived perennial *Melicope haupuensis* and is currently unoccupied. This unit is essential to the conservation of the taxon because it supports habitat that is important to the establishment of additional populations on Kauai 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, moist talus slopes in *Metrosideros polymorpha* dominated lowland mesic forest or *Metrosideros polymorpha*-*Acacia koa* montane mesic forest. This unit is geographically separated from the other two units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe. 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 species, this unit is at an appropriate distance from the other unit to avoid their destruction by one naturally occurring catastrophic event.

Kauai 11—*Melicope haupuensis*—b

This unit is critical habitat for *Melicope haupuensis* and is 575 ha (1,418 ac) on State land (Kuia NAR, Kokee and Na Pali Coast State Parks). This unit contains portions of Awaawapuhi, Honopu, and Nualolo Trails, Kainamanu and Kalahu Summits. This unit provides habitat for three populations of 100 mature, reproducing individuals of the long-lived perennial *Melicope haupuensis* and is currently occupied with 11 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, moist talus slopes in *Metrosideros polymorpha* dominated lowland mesic forest or *Metrosideros polymorpha*-*Acacia koa* montane mesic forest. This unit is geographically separated from the other two units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe. 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 species, this unit is at an appropriate distance from the other unit to avoid

their destruction by one naturally occurring catastrophic event.

Kauai 11—*Melicope haupuensis*—c

This unit is critical habitat for *Melicope haupuensis* and is 290 ha (716 ac) on State land (Alakai Wilderness Preserve), containing portions of Kipalau Valley. This unit provides habitat for two populations of 100 mature, reproducing individuals of the long-lived perennial *Melicope haupuensis* and is currently occupied with two plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, moist talus slopes in *Metrosideros polymorpha* dominated lowland mesic forest or *Metrosideros polymorpha*-*Acacia koa* montane mesic forest. This unit is geographically separated from the other two units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe. 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 species, this unit is at an appropriate distance from the other unit to avoid their destruction by one naturally occurring catastrophic event.

Kauai 11—*Melicope knudsenii*—a

This unit is critical habitat for *Melicope knudsenii* and is 967 ha (2,389 ac) on State land (Kuia NAR). This unit contains portions of Awaawapuhi and Nualolo Trails, and Milolii Ridge. This unit provides habitat for three populations of 100 mature, reproducing individuals of the long-lived perennial *Melicope knudsenii* and is currently occupied with four plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. It provides habitat for the westernmost range of the species that is unique to Kauai. The habitat features contained in this unit that are essential for this species include, but are not limited to, forested flats with brown granular soil in lowland dry to montane mesic forests. This unit provides for three populations within this multi-island species' historical range on Kauai that are 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.

Kauai 11—*Melicope knudsenii*—b

This unit is critical habitat for *Melicope knudsenii* and is 373 ha (922 ac) on State land (Alakai Wilderness Preserve). This unit contains portions of Kawaiiki and Kipalau Valleys. This unit provides habitat for two populations of 100 mature, reproducing individuals of the long-lived perennial *Melicope knudsenii* and is currently occupied with six plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. It provides habitat for the westernmost range of the species that is unique to Kauai. The habitat features contained in this unit that are essential for this species include, but are not limited to, forested flats with brown granular soil in lowland dry to montane mesic forests. This unit provides for two populations within this multi-island species' historical range on Kauai that are 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.

Kauai 11—*Melicope pallida*—a

This unit is critical habitat for *Melicope pallida* and is 143 ha (353 ac) on State land (Alakai Wilderness Preserve), containing portions of Kipalau Valley. This unit provides habitat for one population of 100 mature, reproducing individuals of the long-lived perennial *Melicope pallida* and is currently occupied with 10 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. It provides habitat for the westernmost range of the species. The habitat features contained in this unit that are essential for this species include, but are not limited to, steep rock faces in lowland to montane mesic to wet forests or shrubland. This unit provides for one population within this multi-island species' historical range on Kauai that 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.

Kauai 11—*Melicope pallida*—b

This unit is critical habitat for *Melicope pallida* and is 310 ha (766 ac) on State land (Na Pali Coast State Park). This unit contains portions of Kaaalahina Ridge and Puu Ki Summit. This unit provides habitat for two populations of 100 mature, reproducing individuals of the long-lived perennial *Melicope pallida* and is currently occupied with 50 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. It provides habitat for the westernmost range of the species. The habitat features contained in this unit that are essential for this species include, but are not limited to, steep rock faces in lowland to montane mesic to wet forests or shrubland. This unit provides for two populations within this multi-island species' historical range on Kauai that are 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.

Kauai 5—*Munroidendron racemosum*—a

This unit is critical habitat for *Munroidendron racemosum* and is 60 ha (148 ac) on State land (Nonou Forest Reserve). This unit contains Nonou Summit and the Sleeping Giant. This unit provides habitat for one population of 100 mature, reproducing individuals of the long-lived perennial *Munroidendron racemosum* and is currently occupied with six plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, steep exposed cliffs or ridge slopes in coastal or lowland mesic forest. This unit is geographically separated from the other three units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 7—*Munroidendron racemosum*—b

This unit is critical habitat for *Munroidendron racemosum* and is 50 ha (123 ac) on private land, containing

Naluakeina Summit and Queen Victoria's Profile. This unit provides habitat for one population of 100 mature, reproducing individuals of the long-lived perennial *Munroidendron racemosum* and is currently occupied with two plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, steep exposed cliffs or ridge slopes in coastal or lowland mesic forest. This unit is geographically separated from the other three units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Munroidendron racemosum*—c

This unit is critical habitat for *Munroidendron racemosum* and is 1,952 ha (4,824 ac) on State (Hono o Na Pali NAR, Haena and Na Pali Coast State Parks) and private land. This unit contains Hanakapiai, Hanakoa, and Kalalau Valleys, Kanakou Summit, Kaaalahina and Kalepa Ridges, Nualolo Kai, and Pohakuao. This unit provides habitat for six populations of 100 mature, reproducing individuals of the long-lived perennial *Munroidendron racemosum* and is currently occupied with 46 to 86 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, steep exposed cliffs or ridge slopes in coastal or lowland mesic forest. This unit is geographically separated from the other three units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Munroidendron racemosum*—d

This unit is critical habitat for *Munroidendron racemosum* and is 153 ha (379 ac) on State land (Alakai Wilderness Preserve). This unit contains portions of Kawaiiki and Kipalau Valleys. This unit provides habitat for two populations of 100 mature, reproducing individuals of the long-

lived perennial *Munroidendron racemosum* and is currently occupied with three plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, steep exposed cliffs or ridge slopes in coastal or lowland mesic forest. This unit is geographically separated from the other three units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 7—*Myrsine linearifolia*—a

This unit is critical habitat for *Myrsine linearifolia* and is 334 ha (825 ac) on private land. This unit contains Hokulei Peak, Haupu and Naluakeina Summits, and Queen Victoria's Profile. This unit provides habitat for one population of 100 mature, reproducing individuals of the long-lived perennial *Myrsine linearifolia* and is currently unoccupied. This unit is essential to the conservation of the taxon because it supports habitat that is important to the establishment of additional populations on Kauai 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, diverse mesic or wet lowland or montane *Metrosideros polymorpha* forest with *Cheirodendron* spp. or *Dicranopteris linearis* as co-dominant species. This unit is geographically separated from the other five units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 10—*Myrsine linearifolia*—b

This unit is critical habitat for *Myrsine linearifolia* and is 167 ha (412 ac) on private and State land (Lihue-Koloa Forest Reserve). This unit contains Hulua, Kahili, and Kapalaoa Summits. This unit provides habitat for one population of 100 mature, reproducing individuals of the long-lived perennial *Myrsine linearifolia* and is currently occupied with 47 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in

this unit that are essential for this species include, but are not limited to, diverse mesic or wet lowland or montane *Metrosideros polymorpha* forest with *Cheirodendron* spp. or *Dicranopteris linearis* as co-dominant species. This unit is geographically separated from the other five units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Myrsine linearifolia*—c

This unit is critical habitat for *Myrsine linearifolia* and is 685 ha (1,692 ac) on State land (Alakai Wilderness Preserve), containing portions of Kipalau Valley. This unit provides habitat for three populations of 100 mature, reproducing individuals of the long-lived perennial *Myrsine linearifolia* and is currently occupied with 34 to 44 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, diverse mesic or wet lowland or montane *Metrosideros polymorpha* forest with *Cheirodendron* spp. or *Dicranopteris linearis* as co-dominant species. This unit is geographically separated from the other five units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Myrsine linearifolia*—d

This unit is critical habitat for *Myrsine linearifolia* and is 286 ha (707 ac) on State (Halelea Forest Reserve, Hono o Na Pali NAR, and Na Pali Coast State Park) and private land. This unit contains Hono o Na Pali and Pali Elelee Summits, and Limahuli Falls. This unit provides habitat for one population of 100 mature, reproducing individuals of the long-lived perennial *Myrsine linearifolia* and is currently occupied with 23 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, diverse mesic or wet lowland or montane *Metrosideros polymorpha* forest with *Cheirodendron*

spp. or *Dicranopteris linearis* as co-dominant species. This unit is geographically separated from the other five units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Myrsine linearifolia*—e

This unit is critical habitat for *Myrsine linearifolia* and is 345 ha (854 ac) on State land (Hono o Na Pali NAR, Kokee and Na Pali Coast State Parks). This unit contains Alealau, Pihea, and Puu o Kila Summits. This unit provides habitat for two populations of 100 mature, reproducing individuals of the long-lived perennial *Myrsine linearifolia* and is currently occupied with 366 to 420 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species. The habitat features contained in this unit that are essential for this species include, but are not limited to, diverse mesic or wet lowland or montane *Metrosideros polymorpha* forest with *Cheirodendron* spp. or *Dicranopteris linearis* as co-dominant species. This unit is geographically separated from the other five units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Myrsine linearifolia*—f

This unit is critical habitat for *Myrsine linearifolia* and is 135 ha (334 ac) on State (Halelea Forest Reserve) and private land, containing Kaliko Summit. This unit provides habitat for one population of 100 mature, reproducing individuals of the long-lived perennial *Myrsine linearifolia* and is currently occupied with 20 to 30 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, diverse mesic or wet lowland or montane *Metrosideros polymorpha* forest with *Cheirodendron* spp. or *Dicranopteris linearis* as co-dominant species. This unit is geographically separated from the other five units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Nothocestrum peltatum*—a

This unit is critical habitat for *Nothocestrum peltatum* and is 427 ha (1,056 ac) on State land (Kokee State Park). This unit contains portions of Kumuwela Ridge and Trail. This unit provides habitat for two populations of 100 mature, reproducing individuals of the long-lived perennial *Nothocestrum peltatum* and is currently unoccupied. This unit is essential to the conservation of the taxon because it supports habitat that is important to the establishment of additional populations on Kauai 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, rich soil on steep slopes in mesic or wet forest dominated by *Acacia koa* or a mixture of *Acacia koa* and *Metrosideros polymorpha*. This unit is geographically separated from the other three units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Nothocestrum peltatum*—b

This unit is critical habitat for *Nothocestrum peltatum* and is 1,465 ha (3,619 ac) on State land (Kuia NAR, Kokee, Waimea Canyon, and Na Pali Coast State Parks). This unit contains portions of Awaawapuhi, Honopu, and Nualolo Trails, Kainamanu and Kalahu Summits, and Mahanaloa Valley. This unit provides habitat for four populations of 100 mature, reproducing individuals of the long-lived perennial *Nothocestrum peltatum* and is currently occupied with 12 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important to the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, rich soil on steep slopes in mesic or wet forest dominated by *Acacia koa* or a mixture of *Acacia koa* and *Metrosideros polymorpha*. This unit is geographically separated from the other three units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Nothocestrum peltatum*—c

This unit is critical habitat for *Nothocestrum peltatum* and is 80 ha (198 ac) on State land (Kokee and Na Pali Coast State Parks). This unit

contains Kahuamaa Flat and Puu o Kila Summit. This unit provides habitat for one population of 100 mature, reproducing individuals of the long-lived perennial *Nothocestrum peltatum* and is currently occupied with five plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, rich soil on steep slopes in mesic or wet forest dominated by *Acacia koa* or a mixture of *Acacia koa* and *Metrosideros polymorpha*. This unit is geographically separated from the other three units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 12—*Nothocestrum peltatum*—d

This unit is critical habitat for *Nothocestrum peltatum* and is 161 ha (400 ac) on State land (Waimea Canyon State Park and Puu Ka Pele Forest Reserve). This unit contains Puu Lua Summit. This unit provides habitat for two populations of 100 mature, reproducing individuals of the long-lived perennial *Nothocestrum peltatum* and is currently occupied with three plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, rich soil on steep slopes in mesic or wet forest dominated by *Acacia koa* or a mixture of *Acacia koa* and *Metrosideros polymorpha*. This unit is geographically separated from the other three units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 14—*Panicum niihauense*—a

This unit is critical habitat for *Panicum niihauense* and is 118 ha (296 ac) on State (Polihale State Park and Puu Ka Pele Forest Reserve) and Federal land (Pacific Missile Range Facility). This unit contains Nohili Point. This unit provides habitat for three populations of 300 mature, reproducing individuals of the short-lived perennial *Panicum niihauense* and is currently occupied with 23 plants. This unit is

essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. It provides habitat for the easternmost range of the species. The habitat features contained in this unit that are essential for this species include, but are not limited to, sand dunes in coastal shrubland. This unit is geographically separated from the other three units designated as critical habitat for this species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe. 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 species, this unit is at an appropriate distance from the other unit to avoid their destruction by one naturally occurring catastrophic event.

Kauai 15—*Panicum niihauense*—b

This unit is critical habitat for *Panicum niihauense* and is 15 ha (38 ac) on federal land (Pacific Missile Range Facility). This unit contains Mana Point and Waieli Draw. This unit provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *Panicum niihauense* and is currently unoccupied. This unit is essential to the conservation of the taxon because it supports habitat that is important to the establishment of additional populations on Kauai 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, sand dunes in coastal shrubland. This unit is geographically separated from the other three units designated as critical habitat for this species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe. 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 species, this unit is at an appropriate distance from the other unit to avoid their destruction by one naturally occurring catastrophic event.

Kauai 16—*Panicum niihauense*—c

This unit is critical habitat for *Panicum niihauense* and is 11 ha (28 ac) on Federal land (Pacific Missile Range Facility) along the western coastline near the radio facility. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Panicum niihauense* and is currently unoccupied.

This unit is essential to the conservation of the taxon because it supports habitat that is important to the establishment of additional populations on Kauai in order to reach recovery goals. It provides habitat for the easternmost range of the species. The habitat features contained in this unit that are essential for this species include, but are not limited to, sand dunes in coastal shrubland. This unit is geographically separated from the other three units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe. 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 species, this unit is at an appropriate distance from the other unit to avoid their destruction by one naturally occurring catastrophic event.

Kauai 17—*Panicum niihauense*—d

This unit is critical habitat for *Panicum niihauense* and is 27 ha (67 ac) on Federal and State land. This unit contains Kokole Point. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Panicum niihauense* and is currently unoccupied. This unit is essential to the conservation of the taxon because it supports habitat that is important to the establishment of additional populations on Kauai in order to reach recovery goals. It provides habitat for the easternmost range of the species. The habitat features contained in this unit that are essential for this species include, but are not limited to, sand dunes in coastal shrubland. This unit is geographically separated from the other three units designated as critical habitat for this species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe. 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 species, this unit is at an appropriate distance from the other unit to avoid their destruction by one naturally occurring catastrophic event.

Kauai 7—*Peucedanum sandwicense*—a

This unit is critical habitat for *Peucedanum sandwicense* and is 21 ha (53 ac) on private land. This unit contains Haupu Summit and Queen Victoria's Profile. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Peucedanum sandwicense* and is currently occupied

with one plant. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. It provides habitat for the westernmost range of the species. The habitat features contained in this unit that are essential for this species include, but are not limited to, cliff habitats in mixed shrub coastal dry cliff communities or diverse mesic forest. This unit provides for one population within this multi-island species' historical range on Kauai that 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.

Kauai 11—*Peucedanum sandwicense*—b

This unit is critical habitat for *Peucedanum sandwicense* and is 579 ha (1,431 ac) on State land (Kuia NAR and Na Pali Coast State Park). This unit contains portions of Kuia and Mahanaloa Valleys, and Milolii Ridge. This unit provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *Peucedanum sandwicense* and is currently occupied with 55 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. It provides habitat for the westernmost range of the species. The habitat features contained in this unit that are essential for this species include, but are not limited to, cliff habitats in mixed shrub coastal dry cliff communities or diverse mesic forest. This unit provides for two populations within this multi-island species' historical range on Kauai that are 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.

Kauai 11—*Peucedanum sandwicense*—c

This unit is critical habitat for *Peucedanum sandwicense* and is 181 ha (447 ac) on State land (Hono o Na Pali NAR and Na Pali Coast State Park). This unit contains portions of Kaaalahina Ridge, and Alealau, Kanakou, Keanapuka, and Puu Ki Summits. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial

Peucedanum sandwicense and is currently occupied with 100 to 200 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. It provides habitat for the westernmost range of the species. The habitat features contained in this unit that are essential for this species include, but are not limited to, cliff habitats in mixed shrub coastal dry cliff communities or diverse mesic forest. This unit provides for one population within this multi-island species' historical range on Kauai that 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.

Kauai 10—*Phlegmariurus nutans*—a

This unit is critical habitat for *Phlegmariurus nutans* and is 621 ha (1,532 ac) on State (Lihue-Koloa Forest Reserve) and private land. This unit contains Kahili, Kalalea, Kamanu, Kapalaoa, and Kawaikini Summits. This unit provides habitat for three populations of 300 mature, reproducing individuals of the short-lived perennial *Phlegmariurus nutans* and is currently unoccupied. This unit is essential to the conservation of the taxon because it supports habitat that is important to the establishment of additional populations on Kauai in order to reach recovery goals. It provides habitat for the westernmost range of the species. The habitat features contained in this unit that are essential for this species include, but are not limited to, tree trunks on open ridges and slopes in *Metrosideros polymorpha-Dicranopteris linearis* wet forest. This unit provides for three populations within this multi-island species' historical range on Kauai that are 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. This species has wind-blown spores with limited opportunity for germination and growth. Therefore, this species requires large intact areas of land to support a viable population.

Kauai 11—*Phyllostegia knudsenii*—a

This unit is critical habitat for *Phyllostegia knudsenii* and is 297 ha (735 ac) on State land (Alakai Wilderness Preserve). This unit contains portions of Kawaiiki and Kipalau Valleys. This unit provides habitat for three populations of 300 mature,

reproducing individuals of the short-lived perennial *Phyllostegia knudsenii* and is currently occupied with 4 to 13 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, *Metrosideros polymorpha* lowland mesic or wet forest. Although we do not feel 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.

Kauai 11—*Phyllostegia waimeae*—a

This unit is critical habitat for *Phyllostegia waimeae* and is 365 ha (901 ac) on State land (Alakai Wilderness Preserve), containing portions of Kawaiiki Ridge. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Phyllostegia waimeae* and is currently occupied with six plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, *Acacia koa-Metrosideros polymorpha* dominated wet or mixed mesic forest with *Cheirodendron* spp. or *Dicranopteris linearis* as co-dominants. Although we do not feel 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.

Kauai 4—*Phyllostegia wawrana*—a

This unit is critical habitat for *Phyllostegia wawrana* and is 351 ha (871 ac) on State (Kealia Forest Reserve) and private land. This unit contains Lelewi, Makaleha, Uluawaa, and Wekiu Summits. This unit provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *Phyllostegia wawrana* and is currently occupied with 25 to 35 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently

considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, *Acacia koa-Metrosideros polymorpha-Cheirodendron* mixed mesic forest. This unit is geographically separated from the other three units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Phyllostegia wawrana*—b

This unit is critical habitat for *Phyllostegia wawrana* and is 1,038 ha (2,565 ac) on State (Alakai Wilderness Preserve, Halelea Forest Reserve, Hono o Na Pali NAR, and Na Pali Coast State Park) and private land. This unit contains Hanakoa Valley, and Alealau Summit, Hono O Napali, Keanapuka, Moaalele, Pali elele, Pohakea, Puu Ki, and Waiahuakua Summits. This unit provides habitat for three populations of 300 mature, reproducing individuals of the short-lived perennial *Phyllostegia wawrana* and is currently occupied with three plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, *Acacia koa-Metrosideros polymorpha-Cheirodendron* mixed mesic forest. This unit is geographically separated from the other three units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Phyllostegia wawrana*—c

This unit is critical habitat for *Phyllostegia wawrana* and is 108 ha (268 ac) on State land (Alakai Wilderness Preserve), containing portions of Kipalau Valley. This unit provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *Phyllostegia wawrana* and is currently occupied with 1 to 10 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, *Acacia koa-Metrosideros polymorpha-Cheirodendron* mixed mesic forest. This unit is geographically

separated from the other three units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Phyllostegia wawrana*—d

This unit is critical habitat for *Phyllostegia wawrana* and is 251 ha (620 ac) on State land (Kokee and Na Pali Coast State Parks). This unit contains portions of Honopu Trail, Kainamanu and Kalahu Summits, and Kalalau Lookout. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Phyllostegia wawrana* and is currently occupied with 5 to 6 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable.

The habitat features contained in this unit that are essential for this species include, but are not limited to, *Acacia koa-Metrosideros polymorpha-Cheirodendron* mixed mesic forest. This unit is geographically separated from the other three units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 10—*Plantago princeps*—a

This unit is critical habitat for *Plantago princeps* and is 277 ha (682 ac) on State (Halelea and Lihue-Koloa Forest Reserves) and private land. This unit contains Kuaohukini Summit. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Plantago princeps* and is currently occupied with 350 to 400 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. It provides habitat for the westernmost range of the species that is unique to Kauai. The habitat features contained in this unit that are essential for this species include, but are not limited to, windswept areas near waterfalls in *Metrosideros polymorpha-Cheirodendron* montane wet forest with riparian vegetation or *Metrosideros polymorpha* lowland to montane transitional wet forest on cliffs and ridges, growing on rocky basalt outcrops. This unit provides for one population within this multi-island species' historical range on Kauai that 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.

Kauai 11—*Plantago princeps*—b

This unit is critical habitat for *Plantago princeps* and is 126 ha (312 ac) on State land (Kokee and Na Pali Coast State Park), containing Kalalau Lookout. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Plantago princeps* and is currently occupied with 18 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. It provides habitat for the westernmost range of the species that is unique to Kauai. The habitat features contained in this unit that are essential for this species include, but are not limited to, windswept areas near waterfalls in *Metrosideros polymorpha*-*Cheirodendron* montane wet forest with riparian vegetation or *Metrosideros polymorpha* lowland to montane transitional wet forest on cliffs and ridges, growing on rocky basalt outcrops. This unit provides for one population within this multi-island species' historical range on Kauai that 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.

Kauai 11—*Plantago princeps*—c

This unit is critical habitat for *Plantago princeps* and is 244 ha (603 ac) on State land (Halelea Forest Reserve). This unit contains Kaliko and Puu Manu Summits. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Plantago princeps* and is currently unoccupied. This unit is essential to the conservation of the taxon because it supports habitat that is important to the establishment of additional populations on Kauai in order to reach recovery goals. It provides habitat for the westernmost range of the species that is unique to Kauai. The habitat features contained in this unit that are essential for this species include, but are not limited to, windswept areas near waterfalls in *Metrosideros polymorpha*-*Cheirodendron* montane wet forest with riparian vegetation or *Metrosideros polymorpha* lowland to montane transitional wet forest on cliffs and

ridges, growing on rocky basalt outcrops.

Kauai 11—*Plantago princeps*—d

This unit is critical habitat for *Plantago princeps* and is 77 ha (189 ac) on State land (Hono o Na Pali NAR and Na Pali Coast State Park). This unit contains Alealau and Puu Ki Summits, and Kaaalahina Ridge. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Plantago princeps* and is currently occupied with 20 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. It provides habitat for the westernmost range of the species that is unique to Kauai. The habitat features contained in this unit that are essential for this species include, but are not limited to, windswept areas near waterfalls in *Metrosideros polymorpha*-*Cheirodendron* montane wet forest with riparian vegetation or *Metrosideros polymorpha* lowland to montane transitional wet forest on cliffs and ridges, growing on rocky basalt outcrops. This unit provides for one population within this multi-island species' historical range on Kauai that 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.

Kauai 11—*Platanthera holochila*—a

This unit is critical habitat for *Platanthera holochila* and is 4,148 ha (10,251 ac) on State (Alakai Wilderness Preserve, Halelea Forest Reserve, Hono o Na Pali NAR, and Na Pali Coast State Park) and private land. This unit contains the Alakai Swamp and Trail, Halehaha and Halepaakai Streams, and Kapoki, Kilohana, Kaali, and Pihea Summits. This unit provides habitat for four populations of 300 mature, reproducing individuals of the short-lived perennial *Platanthera holochila* and is currently occupied with 24 to 34 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. It provides habitat for the westernmost range of the species. The habitat features contained in this unit that are essential for this species include, but are not limited to, montane *Metrosideros polymorpha*-

Dicranopteris linearis wet forest or *M. polymorpha* mixed bog. This unit provides for four populations within this multi-island species' historical range on Kauai that are 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.

Kauai 11—*Poa mannii*—a

This unit is critical habitat for *Poa mannii* and is 1,872 ha (4,624 ac) on State land (Kuia NAR, Kokee, Na Pali Coast, and Waimea Canyon State Parks, and Puu Ka Pele Forest Reserve). This unit contains portions of Anakai, and Awaawapuhi, Honopu, and Nualolo Trails, and Haahole, Kuia, and Mahanaloa Valleys, and Milolii Ridge. This unit provides habitat for four populations of 300 mature, reproducing individuals of the short-lived perennial *Poa mannii* and is currently unoccupied. This unit is essential to the conservation of the taxon because it supports habitat that is important to the establishment of additional populations on Kauai 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, cliffs or rock faces in lowland or montane mesic *Metrosideros polymorpha* or *Acacia koa*-*Metrosideros polymorpha* forest. This unit is geographically separated from the other three units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Poa mannii*—b

This unit is critical habitat for *Poa mannii* and is 677 ha (1,673 ac) on State land (Alakai Wilderness Preserve), containing portions of Kipalau Valley. This unit provides habitat for three populations of 300 mature, reproducing individuals of the short-lived perennial *Poa mannii* and is currently occupied with 50 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, cliffs or rock faces in lowland or montane mesic *Metrosideros polymorpha* or *Acacia koa*-*Metrosideros polymorpha* forest. This unit is geographically separated from the other three units designated as critical habitat for this island-endemic species, in order

to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Poa mannii*—c

This unit is critical habitat for *Poa mannii* 155 ha (383 ac) on State land (Hono o Na Pali NAR and Na Pali Coast State Park). This unit contains portions of Kaaalahina Ridge, and Alealau, Kanakou, and Puu Ki Summits. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Poa mannii* and is currently unoccupied. This unit is essential to the conservation of the taxon because it supports habitat that is important to the establishment of additional populations on Kauai 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, cliffs or rock faces in lowland or montane mesic *Metrosideros polymorpha* or *Acacia koa-Metrosideros polymorpha* forest. This unit is geographically separated from the other three units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Poa mannii*—d

This unit is critical habitat for *Poa mannii* and is 307 ha (759 ac) on State land (Na Pali-Kona Forest Reserve, Kokee and Na Pali Coast State Parks). This unit contains Kalahu, Niania, and Puu o Kila Summits, Kalepa Ridge, and Nakeikionaiwa Pillar. This unit provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *Poa mannii* and is currently occupied with 205 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, cliffs or rock faces in lowland or montane mesic *Metrosideros polymorpha* or *Acacia koa-Metrosideros polymorpha* forest. This unit is geographically separated from the other three units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Poa sandvicensis*—a

This unit is critical habitat for *Poa sandvicensis* and is 1,111 ha (2,746 ac) on State land (Alakai Wilderness

Preserve). This unit contains portions of Kawaiiki Ridge and Kipalau Valley. This unit provides habitat for six populations of 300 mature, reproducing individuals of the short-lived perennial *Poa sandvicensis* and is currently occupied with 1,000 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. The habitat features contained in this unit that are essential for this species include, but are not limited to, wet, shaded, gentle to steep slopes, ridges, and rock ledges of stream banks in semi-open to closed, wet, diverse *Acacia koa-Metrosideros polymorpha* montane forest. This unit is geographically separated from the other unit designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Poa sandvicensis*—b

This unit is critical habitat for *Poa sandvicensis* and is 52 ha (129 ac) on State land (Alakai Wilderness Preserve, Hono o Na Pali NAR, and Na Pali Coast State Park). This unit contains Alealau and Keanapuka Summits. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Poa sandvicensis* and is currently occupied with four plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, wet, shaded, gentle to steep slopes, ridges, and rock ledges of stream banks in semi-open to closed, wet, diverse *Acacia koa-Metrosideros polymorpha* montane forest. This unit is geographically separated from the other unit designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Poa siphonoglossa*—a

This unit is critical habitat for *Poa siphonoglossa* and is 1,620 ha (4,008 ac) on State land (Kuia NAR, Kokee and Na Pali Coast State Parks). This unit contains portions of Kahuamaa Flat, Kaunuahaa and Milolii Ridges, Kuia and Mahanaloa Valleys, Nualolo Trail, and Kainamanu and Puu O Kila Summits. This unit provides habitat for five

populations of 300 mature, reproducing individuals of the short-lived perennial *Poa siphonoglossa* and is currently occupied with 13 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, shady banks on steep slopes in mesic *Metrosideros polymorpha-Acacia koa* forests. This unit is geographically separated from the other unit designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Poa siphonoglossa*—b

This unit is critical habitat for *Poa siphonoglossa* and is 2,189 ha (5,410 ac) on State land (Alakai Wilderness Preserve). This unit contains portions of Kawaiiki Ridge and Kipalau Valley. This unit provides habitat for five populations of 300 mature, reproducing individuals of the short-lived perennial *Poa siphonoglossa* and is currently occupied with 30 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, shady banks on steep slopes in mesic *Metrosideros polymorpha-Acacia koa* forests. This unit is geographically separated from the other unit designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 7—*Pteralyxia kauaiensis*—a

This unit is critical habitat for *Pteralyxia kauaiensis* and is 345 ha (854 ac) on private land. This unit contains Hokulei Peak, Haupū and Naluakeina Summits, and Queen Victoria's Profile. This unit provides habitat for one population of 100 mature, reproducing individuals of the long-lived perennial *Pteralyxia kauaiensis* and is currently occupied with 10 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population,

which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, diverse mesic or *Diospyros sandwicensis* mixed mesic forests with *Pisonia* spp. This unit is geographically separated from the other six units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 10—*Pteralyxia kauaiensis*—b

This unit is critical habitat for *Pteralyxia kauaiensis* and is 304 ha (752 ac) on State (Halelea and Lihue-Koloa Forest Reserves) and private land, containing Kuaohukini Summit. This unit provides habitat for one population of 100 mature, reproducing individuals of the long-lived perennial *Pteralyxia kauaiensis* and is currently occupied with two plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, diverse mesic or *Diospyros sandwicensis* mixed mesic forests with *Pisonia* spp. This unit is geographically separated from the other six units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Pteralyxia kauaiensis*—c

This unit is critical habitat for *Pteralyxia kauaiensis* and is 209 ha (516 ac) on State land (Hono o Na Pali NAR and Na Pali Coast State Park). This unit contains Alealau, Kanakou, and Puu Ki Summits and Kaaalahina Ridge. This unit provides habitat for one population of 100 mature, reproducing individuals of the long-lived perennial *Pteralyxia kauaiensis* and is currently occupied with 24 to 33 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, diverse mesic or *Diospyros sandwicensis* mixed mesic forests with *Pisonia* spp. This unit is geographically separated from the other six units designated as critical habitat for this

island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Pteralyxia kauaiensis*—d

This unit is critical habitat for *Pteralyxia kauaiensis* and is 57 ha (141 ac) on State land within Makaha Valley. This unit provides habitat for one population of 100 mature, reproducing individuals of the long-lived perennial *Pteralyxia kauaiensis* and is currently occupied with 300 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. The habitat features contained in this unit that are essential for this species include, but are not limited to, diverse mesic or *Diospyros sandwicensis* mixed mesic forests with *Pisonia* spp. This unit is geographically separated from the other six units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Pteralyxia kauaiensis*—e

This unit is critical habitat for *Pteralyxia kauaiensis* and is 353 ha (873 ac) on State land (Na Pali Coast State Park) within Kalalau Valley. This unit provides habitat for one population of 100 mature, reproducing individuals of the long-lived perennial *Pteralyxia kauaiensis* and is currently occupied with 332 to 337 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. The habitat features contained in this unit that are essential for this species include, but are not limited to, diverse mesic or *Diospyros sandwicensis* mixed mesic forests with *Pisonia* spp. This unit is geographically separated from the other six units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Pteralyxia kauaiensis*—f

This unit is critical habitat for *Pteralyxia kauaiensis* and is 588 ha (1,445 ac) on State (Alakai Wilderness Preserve and Puu Ka Pele Forest Reserve) and private land. This unit contains Hipalau, Kawaiiki, Kipalau, and Oneopaewa Valleys and portions of Kaluahaulu Ridge. This unit provides habitat for two populations of 100 mature, reproducing individuals of the

long-lived perennial *Pteralyxia kauaiensis* and is currently occupied with 70 to 82 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, diverse mesic or *Diospyros sandwicensis* mixed mesic forests with *Pisonia* spp. This unit is geographically separated from the other six units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Pteralyxia kauaiensis*—g

This unit is critical habitat for *Pteralyxia kauaiensis* and is 445 ha (1,100 ac) on State land (Kuia NAR, Na Pali Coast State Park, and Puu Ka Pele Forest Reserve). This unit contains Kawaiula, Kuia, Mahanaloa, Paaiki, and Poopooiki Valleys and Milolii Ridge. This unit provides habitat for two populations of 100 mature, reproducing individuals of the long-lived perennial *Pteralyxia kauaiensis* and is currently occupied with 335 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population. The habitat features contained in this unit that are essential for this species include, but are not limited to, diverse mesic or *Diospyros sandwicensis* mixed mesic forests with *Pisonia* spp. This unit is geographically separated from the other six units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Remya kauaiensis*—a

This unit is critical habitat for *Remya kauaiensis* and is 172 ha (426 ac) on State land (Alakai Wilderness Preserve), containing portions of Kipalau Valley. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Remya kauaiensis* and is currently occupied with five to 10 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. 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 *Acacia koa-Metrosideros polymorpha* lowland mesic forest. This unit is geographically separated from the other five units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Remya kauaiensis*—b

This unit is critical habitat for *Remya kauaiensis* and is 66 ha (163 ac) on State land (Na Pali Coast State Park) within Kalalau Valley. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Remya kauaiensis* and is currently occupied with three plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. 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 *Acacia koa-Metrosideros polymorpha* lowland mesic forest. This unit is geographically separated from the other five units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Remya kauaiensis*—c

This unit is critical habitat for *Remya kauaiensis* and is 886 ha (2,190 ac) on State land (Kuia NAR and Kokee State Park). This unit contains portions of Awaawapuhi, Honopu, and Nualolo Trails and Kainamanu Summit. This unit provides habitat for five populations of 300 mature, reproducing individuals of the short-lived perennial *Remya kauaiensis* and is currently occupied with 73 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. 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 *Acacia koa-Metrosideros polymorpha* lowland mesic forest. This unit is geographically separated from the other five units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from

being destroyed by one naturally occurring catastrophe.

Kauai 11—*Remya kauaiensis*—d

This unit is critical habitat for *Remya kauaiensis* and is 47 ha (115 ac) on State land, containing portions of Kaluahaulu Ridge. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Remya kauaiensis* and is currently occupied with 10 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. 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 *Acacia koa-Metrosideros polymorpha* lowland mesic forest. This unit is geographically separated from the other five units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Remya kauaiensis*—e

This unit is critical habitat for *Remya kauaiensis* and is 66 ha (163 ac) on State land (Alakai Wilderness Preserve) and contains portions of Kohua Ridge and the Mohihi Waialai Trail. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Remya kauaiensis* and is currently occupied with one plant. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. 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 *Acacia koa-Metrosideros polymorpha* lowland mesic forest. This unit is geographically separated from the other five units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 12—*Remya kauaiensis*—f

This unit is critical habitat for *Remya kauaiensis* and is 52 ha (128 ac) on State land (Waimea Canyon State Park) near Lapa Picnic Area and Lua Reservoir. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial

Remya kauaiensis and is currently unoccupied. This unit is essential to the conservation of the taxon because it supports habitat that is important to the establishment of additional populations on Kauai 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, steep, north- or northeast-facing slopes in *Acacia koa-Metrosideros polymorpha* lowland mesic forest. This unit is geographically separated from the other five units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Remya montgomeryi*—a

This unit is critical habitat for *Remya montgomeryi* and is 69 ha (171 ac) on State land (Kuia NAR) within portions of the Kuia and Mahanaloa Valleys. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Remya montgomeryi* and is currently unoccupied. This unit is essential to the conservation of the taxon because it supports habitat that is important to the establishment of additional populations on Kauai 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, steep, north- or northeast-facing slopes or cliffs in transitional wet or *Metrosideros polymorpha*-dominated mixed mesic forest. This unit is geographically separated from the other two units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe. 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 species, this unit is at an appropriate distance from the other unit to avoid their destruction by one naturally occurring catastrophic event.

Kauai 11—*Remya montgomeryi*—b

This unit is critical habitat for *Remya montgomeryi* and is 1,010 ha (2,496 ac) on State land (Alakai Wilderness Preserve and Halelea Forest Reserve), containing portions of the Alakai Swamp. This unit provides habitat for four populations of 300 mature, reproducing individuals of the short-lived perennial *Remya montgomeryi* and is currently occupied with nine plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important

for the expansion of the present population, which is currently considered non-viable. 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 or cliffs in transitional wet or *Metrosideros polymorpha*-dominated mixed mesic forest. This unit is geographically separated from the other two units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe. 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 species, this unit is at an appropriate distance from the other unit to avoid their destruction by one naturally occurring catastrophic event.

Kauai 11—*Remya montgomeryi*—c

This unit is critical habitat for *Remya montgomeryi* and is 436 ha (1,077 ac) on State land (Kokee and Na Pali Coast State Parks). This unit contains Kahuamāa Flat, and Kalahu, Pihea, and Puu o Kila Summits, and Kalalau Lookout. This unit provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *Remya montgomeryi* and is currently occupied with 134 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. 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 or cliffs in transitional wet or *Metrosideros polymorpha*-dominated mixed mesic forest. This unit is geographically separated from the other two units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe. 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 species, this unit is at an appropriate distance from the other unit to avoid their destruction by one naturally occurring catastrophic event.

Kauai 11—*Schiedea apokremnos*—a

This unit is critical habitat for *Schiedea apokremnos* and is 170 ha (421 ac) on State land (Na Pali Coast State Park), containing Nakeikionaiwi

Pillar. This unit provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *Schiedea apokremnos* and is currently occupied with one plant. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, crevices of near-vertical basalt coastal cliff faces in sparse dry coastal cliff shrub vegetation. This unit is geographically separated from the other two units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Schiedea apokremnos*—b

This unit is critical habitat for *Schiedea apokremnos* and is 187 ha (463 ac) on State land (Na Pali Coast State Park), containing Kanakou Summit. This unit provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *Schiedea apokremnos* and is currently occupied with 100 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, crevices of near-vertical basalt coastal cliff faces in sparse dry coastal cliff shrub vegetation. This unit is geographically separated from the other two units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Schiedea apokremnos*—c

This unit is critical habitat for *Schiedea apokremnos* and is 295 ha (730 ac) on State land (Na Pali Coast State Park and Puu Ka Pele Forest Reserve). This unit contains portions of Kawaiula, Milolii, Paaiki, and Poopooiki Valleys. This unit provides habitat for five populations of 300 mature, reproducing individuals of the short-lived perennial *Schiedea apokremnos* and is currently occupied with 100 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important

for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, crevices of near-vertical basalt coastal cliff faces in sparse dry coastal cliff shrub vegetation. This unit is geographically separated from the other two units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Schiedea helleri*—a

This unit is critical habitat for *Schiedea helleri* and is 483 ha (1,194 ac) on State land (Alakai Wilderness Preserve), containing portions of Halehaha and Halepaakai Streams. This unit provides habitat for three populations of 300 mature, reproducing individuals of the short-lived perennial *Schiedea helleri* and is currently unoccupied. This unit is essential to the conservation of the taxon because it supports habitat that is important to the establishment of additional populations on Kauai 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, ridges and steep cliffs in closed *Metrosideros polymorpha*-*Dicranopteris linearis* montane wet forest, *M. polymorpha*-*Cheirodendron* spp. montane wet forest, or *Acacia koa*-*M. polymorpha* montane mesic forest. This unit is geographically separated from the other two units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe. 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 species, this unit is at an appropriate distance from the other units to avoid their destruction by one naturally occurring catastrophic event.

Kauai 11—*Schiedea helleri*—b

This unit is critical habitat for *Schiedea helleri* and is 154 ha (381 ac) on State land (Alakai Wilderness Preserve) on portions of Kohua Ridge and the Mohihi-Waialae Trail. This unit provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *Schiedea helleri* and is currently occupied with 50 to 60 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present

population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, ridges and steep cliffs in closed *Metrosideros polymorpha-Dicranopteris linearis* montane wet forest, *M. polymorpha-Cheirodendron* spp. montane wet forest, or *Acacia koa-M. polymorpha* montane mesic forest. This unit is geographically separated from the other two units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe. 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 species, this unit is at an appropriate distance from the other units to avoid their destruction by one naturally occurring catastrophic event.

Kauai 11—*Schiedea helleri*—c

This unit is critical habitat for *Schiedea helleri* and is 172 ha (426 ac) on State land (Alakai Wilderness Preserve), containing portions of Kipalau Valley. This unit provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *Schiedea helleri* and is currently unoccupied. This unit is essential to the conservation of the taxon because it supports habitat that is important to the establishment of additional populations on Kauai 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, ridges and steep cliffs in closed *Metrosideros polymorpha-Dicranopteris linearis* montane wet forest, *M. polymorpha-Cheirodendron* spp. montane wet forest, or *Acacia koa-M. polymorpha* montane mesic forest. This unit is geographically separated from the other two units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe. 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 species, this unit is at an appropriate distance from the other units to avoid their destruction by one naturally occurring catastrophic event.

Kauai 11—*Schiedea kauaiensis*—a

This unit is critical habitat for *Schiedea kauaiensis* and is 12 ha (29 ac) on private land, containing Pohakukane Cliffs. This unit provides habitat for one population of 300 mature, reproducing

individuals of the short-lived perennial *Schiedea kauaiensis* and is currently unoccupied. This unit is essential to the conservation of the taxon because it supports habitat that is important to the establishment of additional populations on Kauai 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, steep slopes in diverse mesic to wet *Acacia koa-Metrosideros polymorpha* forest. This unit is geographically separated from the other three units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Schiedea kauaiensis*—b

This unit is critical habitat for *Schiedea kauaiensis* and is 395 ha (975 ac) on State land (Kokee and Na Pali Coast State Parks). This unit contains Kahuamaa Flat, and Kalahu, Piheha, and Puu o Kila Summits, and Kalalau Lookout. This unit provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *Schiedea kauaiensis* and is currently occupied with five plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, steep slopes in diverse mesic to wet *Acacia koa-Metrosideros polymorpha* forest. This unit is geographically separated from the other three units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Schiedea kauaiensis*—c

This unit is critical habitat for *Schiedea kauaiensis* and is 510 ha (1,260 ac) on State land (Kuia NAR). This unit contains portions of Kuia and Mahanaloa Valleys and Milolii Ridge. This unit provides habitat for three populations of 300 mature, reproducing individuals of the short-lived perennial *Schiedea kauaiensis* and is currently occupied with 17 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in

this unit that are essential for this species include, but are not limited to, steep slopes in diverse mesic to wet *Acacia koa-Metrosideros polymorpha* forest. This unit is geographically separated from the other three units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Schiedea kauaiensis*—d

This unit is critical habitat for *Schiedea kauaiensis* and is 11 ha (28 ac) on State land (Hono o Na Pali NAR), containing portions of Kalalau Trail. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Schiedea kauaiensis* and is currently unoccupied. This unit is essential to the conservation of the taxon because it supports habitat that is important to the establishment of additional populations on Kauai 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, steep slopes in diverse mesic to wet *Acacia koa-Metrosideros polymorpha* forest. This unit is geographically separated from the other three units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Schiedea membranacea*—a

This unit is critical habitat for *Schiedea membranacea* and is 251 ha (620 ac) on State land (Alakai Wilderness Preserve) within the Koaie Canyon. This unit provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *Schiedea membranacea* and is currently occupied with 6 to 10 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, cliffs or cliff bases of mesic or wet habitats, in lowland or montane shrubland, or forest communities dominated by *Acacia koa*, *Pipturus* spp. and *Metrosideros polymorpha* or Urticaceae shrubland on talus slopes. This unit is geographically separated from the other three units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from

being destroyed by one naturally occurring catastrophe.

Kauai 11—*Schiedea membranacea*—b

This unit is critical habitat for *Schiedea membranacea* and is 234 ha (580 ac) on State land (Kokee and Na Pali Coast State Parks). This unit contains Kalahu and Puu o Kila Summits and Kalalu Lookout. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Schiedea membranacea* and is currently occupied with 24 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, cliffs or cliff bases of mesic or wet habitats, in lowland or montane shrubland, or forest communities dominated by *Acacia koa*, *Pipturus* spp. and *Metrosideros polymorpha* or Urticaceae shrubland on talus slopes. This unit is geographically separated from the other three units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Schiedea membranacea*—c

This unit is critical habitat for *Schiedea membranacea* and is 528 ha (1,303 ac) on State land (Kuia NAR and Puu Ka Pele Forest Reserve). This unit contains portions of Kuia and Mahanaloa Valleys and Milolii Ridge. This unit provides habitat for three populations of 300 mature, reproducing individuals of the short-lived perennial *Schiedea membranacea* and is currently occupied with 266 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, cliffs or cliff bases of mesic or wet habitats, in lowland or montane shrubland, or forest communities dominated by *Acacia koa*, *Pipturus* spp. and *Metrosideros polymorpha* or Urticaceae shrubland on talus slopes. This unit is geographically separated from the other three units designated as critical habitat for this island-endemic species, in order to avoid all recovery

populations from being destroyed by one naturally occurring catastrophe.

Kauai 11—*Schiedea membranacea*—d

This unit is critical habitat for *Schiedea membranacea* and is 327 ha (810 ac) on State land (Kuia NAR and Kokee State Park). This unit contains portions of Awaawapuhi and Honopu Trails and Kainamau Summit. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Schiedea membranacea* and is currently occupied with eight plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, cliffs or cliff bases of mesic or wet habitats, in lowland or montane shrubland, or forest communities dominated by *Acacia koa*, *Pipturus* spp. and *Metrosideros polymorpha* or Urticaceae shrubland on talus slopes. This unit is geographically separated from the other three units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe.

Kauai 7—*Schiedea nuttallii*—a

This unit is critical habitat for *Schiedea nuttallii* and is 282 ha (698 ac) on private land. This unit contains Haupū and Naluakeina Summits and Queen Victoria's Profile. This unit provides habitat for two populations of 100 mature, reproducing individuals of the long-lived perennial *Schiedea nuttallii* and is currently occupied with ten to 50 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. It provides habitat for the westernmost range of the species that is unique to Kauai. The habitat features contained in this unit that are essential for this species include, but are not limited to, cliffs in lowland diverse mesic forest dominated by *Metrosideros polymorpha*. This unit provides for two populations within this multi-island species' historical range on Kauai that are 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.

Kauai 9—*Schiedea spergulina* var. *leiopoda*—a

This unit is critical habitat for *Schiedea spergulina* var. *leiopoda* and is 5 ha (11 ac) on private land within Lawai Valley. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Schiedea spergulina* var. *leiopoda* and is currently occupied with 135 to 150 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, bare rock outcrops or sparsely vegetated portions of rocky cliff faces or cliff bases in diverse lowland dry to mesic forests. Although we do not feel 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.

Kauai 11—*Schiedea spergulina* var. *spergulina*—a

This unit is critical habitat for *Schiedea spergulina* var. *spergulina* and is 131 ha (324 ac) on State land (Na Pali Coast State Park) within Kalalau Valley. This unit provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *Schiedea spergulina* var. *spergulina* and is currently occupied with one plant. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, bare rock outcrops or sparsely vegetated portions of rocky cliff faces or cliff bases in diverse lowland dry to mesic forests. This unit is geographically separated from the other two units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe. 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 species, this unit is of an appropriate distance from the other units to avoid their destruction by one naturally occurring catastrophic event.

Kauai 11—*Schiedea spergulina* var. *spergulina*—b

This unit is critical habitat for *Schiedea spergulina* var. *spergulina* and is 77 ha (191 ac) on State land within Kawaiiki Valley. This unit provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *Schiedea spergulina* var. *spergulina* and is currently occupied with five plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, bare rock outcrops or sparsely vegetated portions of rocky cliff faces or cliff bases in diverse lowland dry to mesic forests. This unit is geographically separated from the other two units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe. 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 species, this unit is at an appropriate distance from the other units to avoid their destruction by one naturally occurring catastrophic event.

Kauai 13—*Schiedea spergulina* var. *spergulina*—c

This unit is critical habitat for *Schiedea spergulina* var. *spergulina* and is 221 ha (545 ac) on State land within Waimea Canyon. This unit provides habitat for two populations of 300 mature, reproducing individuals of the short-lived perennial *Schiedea spergulina* var. *spergulina* and is currently unoccupied. This unit is essential to the conservation of the taxon because it supports habitat that is important to the establishment of additional populations on Kauai 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, bare rock outcrops or sparsely vegetated portions of rocky cliff faces or cliff bases in diverse lowland dry to mesic forests. This unit is geographically separated from the other two units designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe. 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 species, this unit is at an appropriate distance from the other unit to avoid their destruction by one naturally occurring catastrophic event.

Kauai 11—*Schiedea stellarioides*—a

This unit is critical habitat for *Schiedea stellarioides* and is 1,259 ha (3,113 ac) on State land (Alakai Wilderness Preserve and Puu Ka Pele Forest Reserve). This unit contains portions of Kaluahaulu and Kawaiiki Ridges, and Kawaiiki and Kipalau Valleys. This unit provides habitat for five populations of 300 mature, reproducing individuals of the short-lived perennial *Schiedea stellarioides* and is currently occupied with 200 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, steep slopes in closed *Acacia koa*-*Metrosideros polymorpha* lowland or montane mesic forest or shrubland. This unit is geographically separated from the other unit designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe. 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 species, this unit is at an appropriate size and distance from the other unit to avoid their destruction by one naturally occurring catastrophic event.

Kauai 11—*Schiedea stellarioides*—b

This unit is critical habitat for *Schiedea stellarioides* and is 129 ha (320 ac) on State land (Alakai Wilderness Preserve) within upper Waialae Valley. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Schiedea stellarioides* and is currently unoccupied. This unit is essential to the conservation of the taxon because it supports habitat that is important to the establishment of additional populations on Kauai 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, steep slopes in closed *Acacia koa*-*Metrosideros polymorpha* lowland or montane mesic forest or shrubland. This unit is geographically separated from

the other unit designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe. 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 species, this unit is at an appropriate distance from the other unit to avoid their destruction by one naturally occurring catastrophic event.

Kauai 8—*Sesbania tomentosa*—a

This unit is critical habitat for *Sesbania tomentosa* and is 46 ha (115 ac) on private land, containing Paoa Point and Naake Cape. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Sesbania tomentosa* and is currently unoccupied. This unit is essential to the conservation of the taxon because it supports habitat that is important to the establishment of additional populations on Kauai in order to reach recovery goals. It provides habitat for the westernmost range of the species. The habitat features contained in this unit that are essential for this species include, but are not limited to, sandy beaches, dunes, or pond margins in coastal dry shrublands or mixed coastal dry cliffs. This unit provides for one population within this multi-island species' historical range on Kauai that 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.

Kauai 14—*Sesbania tomentosa*—b

This unit is critical habitat for *Sesbania tomentosa* and is 44 ha (109 ac) on State land (Polihale State Park). This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Sesbania tomentosa* and is currently occupied with 11 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. It provides habitat for the westernmost range of the species. The habitat features contained in this unit that are essential for this species include, but are not limited to, sandy beaches, dunes, or pond margins in coastal dry shrublands or mixed coastal dry cliffs. This unit provides for one population within this multi-island species' historical range on Kauai that 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.

Kauai 11—*Solanum sandwicense*—a

This unit is critical habitat for *Solanum sandwicense* and is 2,442 ha (6,039 ac) on State land (Kuia NAR, Kokee and Na Pali Coast State Parks). This unit contains portions of the Awaawapuhi, Berry Flat, Nualolo and Honopu Trails, Kahuamaa Flat, Kainamanu and Kalahu Summits, and Kaunuohua and Kumuwela Ridges. This unit provides habitat for five populations of 300 mature, reproducing individuals of the short-lived perennial *Solanum sandwicense* and is currently occupied with eight to nine plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. It provides habitat for the westernmost range of the species that is unique to Kauai. The habitat features contained in this unit that are essential for this species include, but are not limited to, forest canopies in diverse lowland or montane *Acacia koa* or *Acacia koa-Metrosideros polymorpha* mesic or wet forests. This unit provides for five populations within this multi-island species' historical range on Kauai that are 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.

Kauai 11—*Solanum sandwicense*—b

This unit is critical habitat for *Solanum sandwicense* and is 249 ha (614 ac) on State land, containing portions of Kawaiiki Ridge. This unit provides habitat for one population of 300 mature, reproducing individuals of the short-lived perennial *Solanum sandwicense* and is currently unoccupied. This unit is essential to the conservation of the taxon because it supports habitat that is important to the establishment of additional populations on Kauai in order to reach recovery goals. It provides habitat for the westernmost range of the species that is unique to Kauai. The habitat features contained in this unit that are essential for this species include, but are not limited to, forest canopies in diverse lowland or montane *Acacia koa* or *Acacia koa-Metrosideros polymorpha* mesic or wet forests. This unit provides for one population within this multi-island species' historical range on Kauai

that 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.

Kauai 11—*Spermolepis hawaiiensis*—a

This unit is critical habitat for *Spermolepis hawaiiensis* and is 95 ha (237 ac) on State land (Puu Ka Pele Forest Reserve), containing portions of Kawaiiki Valley. This unit provides habitat for one population of 500 mature, reproducing individuals of the annual *Spermolepis hawaiiensis* and is currently occupied with two plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. It provides habitat for the westernmost range of the species that is unique to Kauai. The habitat features contained in this unit that are essential for this species include, but are not limited to, *Metrosideros polymorpha* forests or *Dodonaea viscosa* lowland dry shrubland. This unit provides for one population within this multi-island species' historical range on Kauai that 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.

Kauai 13—*Spermolepis hawaiiensis*—b

This unit is critical habitat for *Spermolepis hawaiiensis* and is 87 ha (215 ac) on State land, containing portions of Waimea Canyon. This unit provides habitat for one population of 500 mature, reproducing individuals of the annual *Spermolepis hawaiiensis* and is currently occupied with three plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. It provides habitat for the westernmost range of the species that is unique to Kauai. The habitat features contained in this unit that are essential for this species include, but are not limited to, *Metrosideros polymorpha* forests or *Dodonaea viscosa* lowland dry shrubland. This unit provides for one population within this multi-island species' historical range on Kauai that 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.

Kauai 11—*Stenogyne campanulata*—a

This unit is critical habitat for *Stenogyne campanulata* and is 424 ha (1,050 ac) on State land (Kokee and Na Pali Coast State Parks). This unit contains the Kahuamaa Flats. This unit provides habitat for three populations of 300 mature, reproducing individuals of the short-lived perennial *Stenogyne campanulata* and is currently occupied with 51 to 66 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, rock faces of nearly vertical, north-facing cliffs in diverse lowland or montane mesic forest. 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 species, this unit is at an appropriate size to avoid their destruction by one naturally occurring catastrophic event.

Kauai 10—*Viola helenae*—a

This unit is critical habitat for *Viola helenae* and is 610 ha (1,510 ac) on State (Lihue-Koloa Forest Reserve) and private land. This unit contains portions of Kanaele Swamp and Kahili Summit. This unit provides habitat for five populations of 250 mature, reproducing individuals of the short-lived perennial *Viola helenae* and is currently occupied with 137 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, stream drainage banks or adjacent valley bottoms in light to moderate shade in *Metrosideros polymorpha-Dicranopteris linearis* lowland wet forest or *Metrosideros polymorpha-Cheirodendron* wet forest. This unit is at an appropriate size to avoid the destruction of all recovery populations by one naturally occurring catastrophic event.

Kauai 10—*Viola kauaiensis* var. *wahiawaensis*—a

This unit is critical habitat for *Viola kauaiensis* var. *wahiawaensis* and is 657 ha (1,623 ac) on State (Lihue-Koloa Forest Reserve) and private land. This unit contains portions of Kanaele Swamp and Kahili Summit. This unit

provides habitat for five populations of 300 mature, reproducing individuals of the short-lived perennial *Viola kauaiensis* var. *wahiaensis* and is currently occupied with 13 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, *Machaerina angustifolia-Rhynchospora rugosa* lowland bog or mixed wet shrubland and adjacent *Metrosideros polymorpha* wet forest. 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 species, this unit is at an appropriate size to avoid their destruction by one naturally occurring catastrophic event.

Kauai 11—*Wilkesia hobdyi*—a

This unit is critical habitat for *Wilkesia hobdyi* and is 775 ha (1,916 ac) on State land (Hono o Na Pali NAR, Na Pali Coast State Park, and Puu Ka Pele Forest Reserve). This unit contains Anaki, and Kawaiula, Kaaholi, Paaiki, Pohakuao, and Poopooiki Valleys, Kanakou Summit, Manono Ridge, and Nakeikionaiwi Pillar. This unit provides habitat for nine populations of 300 mature, reproducing individuals of the short-lived perennial *Wilkesia hobdyi* and is currently occupied with 81 plants. This unit is important to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, coastal dry cliffs or very dry ridges. The 325–390 other plants on Kauai are not included in critical habitat because the habitat they occupy is not considered essential to the conservation of this species. The more appropriate habitat on Kauai, within its historical range, are being designated as critical habitat.

Kauai 11—*Xylosma crenatum*—a

This unit is critical habitat for *Xylosma crenatum* and is 840 ha (2,077 ac) on State land (Kokee and Na Pali Coast State Parks). This unit contains portions of the Awaawapuhi, Honopu, and Nualolo Trails, and Kainamanu and Kalahu Summits. This unit provides habitat for four populations of 100 mature, reproducing individuals of the long-lived perennial *Xylosma crenatum*

and is currently occupied with 14 plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, diverse *Acacia koa-Metrosideros polymorpha* montane mesic or wet forest, or *Metrosideros polymorpha-Dicranopteris linearis* montane wet forest. This unit is geographically separated from the other unit designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe. 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 species, this unit is at an appropriate size and distance from the other unit to avoid their destruction by one naturally occurring catastrophic event.

Kauai 12—*Xylosma crenatum*—b

This unit is critical habitat for *Xylosma crenatum* and is 52 ha (128 ac) on State land (Kuia NAR and Waimea Canyon State Park) near Lapa Picnic Area and Lua Reservoir. This unit provides habitat for one population of 100 mature, reproducing individuals of the long-lived perennial *Xylosma crenatum* and is currently unoccupied. This unit is essential to the conservation of the taxon because it supports habitat that is important to the establishment of additional populations on Kauai 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, diverse *Acacia koa-Metrosideros polymorpha* montane mesic or wet forest, or *Metrosideros polymorpha-Dicranopteris linearis* montane wet forest. This unit is geographically separated from the other unit designated as critical habitat for this island-endemic species, in order to avoid all recovery populations from being destroyed by one naturally occurring catastrophe. 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 species, this unit is at an appropriate distance from the other unit to avoid their destruction by one naturally occurring catastrophic event.

Kauai 11—*Zanthoxylum hawaiiense*—a

This unit is critical habitat for *Zanthoxylum hawaiiense* and is 523 ha (1,292 ac) on State land (Alakai

Wilderness Preserve and Puu Ka Pele Forest Reserve), containing portions of Kawaiiki Valley. This unit provides habitat for two populations of 100 mature, reproducing individuals of the long-lived perennial *Zanthoxylum hawaiiense* and is currently occupied with three plants. This unit is essential to the conservation of the taxon because it supports an extant colony of this species and includes habitat that is important for the expansion of the present population, which is currently considered non-viable. The habitat features contained in this unit that are essential for this species include, but are not limited to, lowland dry or mesic forests dominated by *Metrosideros polymorpha* or *Diospyros sandwicensis*. This unit provides for two populations within this multi-island species' historical range on Kauai that are 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.

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. 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.

Section 7(a) of the Act requires Federal agencies, including the Service, to evaluate their actions with respect to any species that is proposed or listed as endangered or threatened and with respect to its critical habitat, if any is designated or proposed. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR part 402. Section 7(a)(4) of the Act requires Federal agencies (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 the destruction or adverse modification of proposed critical habitat.

TABLE 4.—APPROXIMATE CRITICAL HABITAT AREA DESIGNATED BY UNIT AND LANDOWNERSHIP OR JURISDICTION, KAUAI COUNTY, HAWAII

Unit name	State/local	Private	Federal	Total
Kauai 1— <i>Ischaemum byrone</i> —a		<1 ha (1 ac)		<1 ha (1 ac)
Kauai 2— <i>Ischaemum byrone</i> —b		5 ha (13 ac)		5 ha (13 ac)
Kauai 3— <i>Ischaemum byrone</i> —c		6 ha (15 ac)		6 ha (15 ac)
Kauai 4— <i>Adenophorus periens</i> —a	237 ha (585 ac)	<1 ha (<1 ac)		237 ha (585 ac)
Kauai 4— <i>Cyanea asarifolia</i> —a	607 ha (1,499 ac)	47 ha (117 ac)		654 ha (1,616 ac)
Kauai 4— <i>Cyanea recta</i> —a	252 ha (622 ac)	<1 ha (<1 ac)		252 ha (622 ac)
Kauai 4— <i>Cyanea recta</i> —b	79 ha (195 ac)	274 ha (678 ac)		353 ha (873 ac)
Kauai 4— <i>Cyanea remyi</i> —a	80 ha (198 ac)	295 ha (730 ac)		376 ha (928 ac)
Kauai 4— <i>Cyrtandra cyaneoides</i> —a	80 ha (198 ac)	295 ha (730 ac)		376 ha (928 ac)
Kauai 4— <i>Cyrtandra limahuliensis</i> —a	498 ha (1,231 ac)	2 ha (6 ac)		501 ha (1,237 ac)
Kauai 4— <i>Cyrtandra limahuliensis</i> —b	79 ha (195 ac)	274 ha (678 ac)		353 ha (873 ac)
Kauai 4— <i>Hibiscus clayi</i> —a		4 ha (9 ac)		4 ha (9 ac)
Kauai 4— <i>Hibiscus clayi</i> —b		85 ha (210 ac)		85 ha (210 ac)
Kauai 4— <i>Hibiscus clayi</i> —c	586 ha (1,448 ac)	2 ha (6 ac)		588 ha (1,454 ac)
Kauai 4— <i>Hibiscus clayi</i> —d		48 ha (119 ac)		48 ha (119 ac)
Kauai 4— <i>Hibiscus clayi</i> —e	19 ha (47 ac)			19 ha (47 ac)
Kauai 4— <i>Labordia lydgatei</i> —a	585 ha (1,447 ac)	2 ha (6 ac)		588 ha (1,453 ac)
Kauai 4— <i>Phyllostegia wawrana</i> —a	78 ha (194 ac)	273 ha (675 ac)		352 ha (869 ac)
Kauai 5— <i>Hibiscus clayi</i> —f	60 ha (148 ac)			60 ha (148 ac)
Kauai 5— <i>Munroidendron racemosum</i> —a	60 ha (148 ac)			60 ha (148 ac)
Kauai 6— <i>Brighamia insignis</i> —a		63 ha (156 ac)		63 ha (156 ac)
Kauai 7— <i>Brighamia insignis</i> —b		341 ha (842 ac)		341 ha (842 ac)
Kauai 7— <i>Delissea rhytidosperma</i> —a		221 ha (545 ac)		221 ha (545 ac)
Kauai 7— <i>Isodendron longifolium</i> —a		337 ha (833 ac)		337 ha (833 ac)
Kauai 7— <i>Lipochaeta micrantha</i> —a		341 ha (842 ac)		341 ha (842 ac)
Kauai 7— <i>Melicope haupuensis</i> —a		330 ha (816 ac)		330 ha (816 ac)
Kauai 7— <i>Munroidendron racemosum</i> —b		50 ha (123 ac)		50 ha (123 ac)
Kauai 7— <i>Myrsine linearifolia</i> —a		334 ha (826 ac)		334 ha (826 ac)
Kauai 7— <i>Peucedanum sandwicense</i> —a		21 ha (52 ac)		21 ha (52 ac)
Kauai 7— <i>Pteralyxia kauaiensis</i> —a		346 ha (854 ac)		346 ha (854 ac)
Kauai 7— <i>Schiedea nuttallii</i> —a		282 ha (697 ac)		282 ha (697 ac)
Kauai 8— <i>Sesbania tomentosa</i> —a		47 ha (115 ac)		47 ha (115 ac)
Kauai 9— <i>Schiedea spergulina</i> var. <i>leiopoda</i> —a		5 ha (11 ac)		5 ha (11 ac)
Kauai 10— <i>Adenophorus periens</i> —b	12 ha (29 ac)	480 ha (1,185 ac)		491 ha (1,215 ac)
Kauai 10— <i>Bonamia menziesii</i> —a	11 ha (28 ac)	409 ha (1,011 ac)		421 ha (1,039 ac)
Kauai 10— <i>Cyanea asarifolia</i> —b	161 ha (398 ac)	742 ha (1,834 ac)		903 ha (2,232 ac)
Kauai 10— <i>Cyanea remyi</i> —b		1,904 ha (4,705 ac)		1,904 ha (4,705 ac)
Kauai 10— <i>Cyanea undulata</i> —a	53 ha (130 ac)	952 ha (2,353 ac)		1,005 ha (2,484 ac)
Kauai 10— <i>Cyrtandra limahuliensis</i> —c	471 ha (1,164 ac)	1,542 ha (3,811 ac)		2,013 ha (4,975 ac)
Kauai 10— <i>Dubautia pauciflora</i> —a	38 ha (93 ac)	776 ha (1,919 ac)		814 ha (2,012 ac)
Kauai 10— <i>Exocarpos luteolus</i> —a	2 ha (5 ac)	399 ha (986 ac)		401 ha (991 ac)
Kauai 10— <i>Hesperonmanna lydgatei</i> —a		646 ha (1,596 ac)		646 ha (1,596 ac)
Kauai 10— <i>Isodendron longifolium</i> —b		142 ha (350 ac)		142 ha (350 ac)
Kauai 10— <i>Labordia lydgatei</i> —b	135 ha (333 ac)	900 ha (2,225 ac)		1,035 ha (2,558 ac)
Kauai 10— <i>Labordia tinifolia</i> var. <i>wahiawaensis</i> —a		913 ha (2,255 ac)		913 ha (2,255 ac)
Kauai 10— <i>Lysimachia filifolia</i> —a	171 ha (421 ac)	824 ha (2,037 ac)		995 ha (2,458 ac)
Kauai 10— <i>Myrsine linearifolia</i> —b	<1 ha (<1 ac)	167 ha (413 ac)		167 ha (413 ac)
Kauai 10— <i>Phlegmariurus nutans</i> —a	44 ha (108 ac)	577 ha (1,425 ac)		620 ha (1,533 ac)
Kauai 10— <i>Plantago princeps</i> —a	276 ha (683 ac)	<1 ha (<1 ac)		277 ha (683 ac)
Kauai 10— <i>Pteralyxia kauaiensis</i> —b	304 ha (751 ac)	<1 ha (<1 ac)		304 ha (751 ac)
Kauai 10— <i>Viola helenae</i> —a	13 ha (33 ac)	598 ha (1,477 ac)		611 ha (1,510 ac)
Kauai 10— <i>Viola kauaiensis</i> var. <i>wahiawaensis</i> —a	54 ha (134 ac)	603 ha (1,489 ac)		657 ha (1,623 ac)
Kauai 11— <i>Adenophorus periens</i> —c	301 ha (743 ac)	168 ha (415 ac)		469 ha (1,158 ac)
Kauai 11— <i>Adenophorus periens</i> —d	914 ha (2,259 ac)	92 ha (227 ac)		1,006 ha (2,485 ac)
Kauai 11— <i>Alectryon macrococcus</i> —a	382 ha (943 ac)			382 ha (943 ac)
Kauai 11— <i>Alectryon macrococcus</i> —b	90 ha (222 ac)			90 ha (222 ac)
Kauai 11— <i>Alsinidendron lychnoides</i> —a	992 ha (2,452 ac)	1 ha (3 ac)		994 ha (2,445 ac)
Kauai 11— <i>Alsinidendron lychnoides</i> —b	138 ha (340 ac)			138 ha (340 ac)
Kauai 11— <i>Alsinidendron lychnoides</i> —c	55 ha (136 ac)			55 ha (136 ac)
Kauai 11— <i>Alsinidendron viscosum</i> —a	736 ha (1,819 ac)			736 ha (1,819 ac)
Kauai 11— <i>Alsinidendron viscosum</i> —b	17 ha (42 ac)			17 ha (42 ac)
Kauai 11— <i>Alsinidendron viscosum</i> —c	22 ha (55 ac)			22 ha (55 ac)
Kauai 11— <i>Alsinidendron viscosum</i> —d	61 ha (150 ac)			61 ha (150 ac)
Kauai 11— <i>Bonamia menziesii</i> —b	93 ha (229 ac)			93 ha (229 ac)
Kauai 11— <i>Brighamia insignis</i> —c	1,639 ha (4,049 ac)			1,639 ha (4,049 ac)
Kauai 11— <i>Centaurium sebaeoides</i> —a	156 ha (385 ac)			156 ha (385 ac)
Kauai 11— <i>Chamaesyce halemanui</i> —a	108 ha (267 ac)			108 ha (267 ac)
Kauai 11— <i>Chamaesyce halemanui</i> —b	17 ha (43 ac)			17 ha (43 ac)
Kauai 11— <i>Chamaesyce halemanui</i> —c	1,283 ha (3,171 ac)			1,283 ha (3,171 ac)
Kauai 11— <i>Ctenitis squamigera</i> —a	735 ha (1,817 ac)			735 ha (1,817 ac)
Kauai 11— <i>Cyanea recta</i> —c	385 ha (951 ac)	168 ha (416 ac)		553 ha (1,367 ac)

TABLE 4.—APPROXIMATE CRITICAL HABITAT AREA DESIGNATED BY UNIT AND LANDOWNERSHIP OR JURISDICTION, KAUAI COUNTY, HAWAII—Continued

Unit name	State/local	Private	Federal	Total
Kauai 11— <i>Cyanea recta</i> —d	143 ha (352 ac)	255 ha (629 ac) .....	.....	397 ha (981 ac)
Kauai 11— <i>Cyanea remyi</i> —c	365 ha (901 ac) .....	.....	.....	365 ha (901 ac)
Kauai 11— <i>Cyanea remyi</i> —d	342 ha (845 ac)	321 ha (794 ac) .....	.....	663 ha (1,638 ac)
Kauai 11— <i>Cyperus trachysanthos</i> —a	432 ha (1,068 ac) .....	.....	.....	432 ha (1,068 ac)
Kauai 11— <i>Cyrtandra cyaneoides</i> —b	553 ha (1,366 ac)	295 ha (730 ac) .....	.....	848 ha (2,095 ac)
Kauai 11— <i>Cyrtandra cyaneoides</i> —c	31 ha (78 ac)	1,085 ha (2,682 ac) .....	.....	1,117 ha (2,759 ac)
Kauai 11— <i>Cyrtandra limahuliensis</i> —d	523 ha (1,292 ac)	293 ha (724 ac) .....	.....	816 ha (2,016 ac)
Kauai 11— <i>Cyrtandra limahuliensis</i> —e	366 ha (905 ac)	327 ha (807 ac) .....	.....	693 ha (1,712 ac)
Kauai 11— <i>Delissea rhytidospema</i> —b	258 ha (638 ac) .....	.....	.....	258 ha (638 ac)
Kauai 11— <i>Delissea rhytidospema</i> —c	103 ha (254 ac) .....	.....	.....	103 ha (254 ac)
Kauai 11— <i>Delissea rivularis</i> —a	850 ha (2,100 ac) .....	.....	.....	850 ha (2,100 ac)
Kauai 11— <i>Delissea undulata</i> —a	139 ha (344 ac)	118 ha (291 ac) .....	.....	257 ha (635 ac)
Kauai 11— <i>Delissea undulata</i> —b	532 ha (1,314 ac) .....	.....	.....	532 ha (1,314 ac)
Kauai 11— <i>Diellia erecta</i> —a	364 ha (901 ac) .....	.....	.....	364 ha (901 ac)
Kauai 11— <i>Diellia pallida</i> —a	601 ha (1,485 ac) .....	.....	.....	601 ha (1,485 ac)
Kauai 11— <i>Diellia pallida</i> —b	55 ha (136 ac) .....	.....	.....	55 ha (136 ac)
Kauai 11— <i>Diplazium molokaiense</i> —a	430 ha (1,062 ac) .....	.....	.....	430 ha (1,062 ac)
Kauai 11— <i>Dubautia latifolia</i> —a	31 ha (76 ac) .....	.....	.....	31 ha (76 ac)
Kauai 11— <i>Dubautia latifolia</i> —b	1,522 ha (3,761 ac) .....	.....	.....	1,522 ha (3,761 ac)
Kauai 11— <i>Dubautia latifolia</i> —c	809 ha (1,999 ac) .....	.....	.....	809 ha (1,999 ac)
Kauai 11— <i>Euphorbia haeleleana</i> —a	263 ha (649 ac) .....	.....	.....	263 ha (649 ac)
Kauai 11— <i>Euphorbia haeleleana</i> —b	192 ha (476 ac) .....	.....	.....	192 ha (476 ac)
Kauai 11— <i>Euphorbia haeleleana</i> —c	204 ha (505 ac) .....	.....	.....	204 ha (505 ac)
Kauai 11— <i>Exocarpos luteolus</i> —b	3,705 ha (9,155 ac)	94 ha (232 ac) .....	.....	3,799 ha (9,387 ac)
Kauai 11— <i>Exocarpos luteolus</i> —c	177 ha (438 ac) .....	.....	.....	177 ha (438 ac)
Kauai 11— <i>Exocarpos luteolus</i> —d	83 ha (206 ac) .....	.....	.....	83 ha (206 ac)
Kauai 11— <i>Exocarpos luteolus</i> —e	522 ha (1,290 ac) .....	.....	.....	522 ha (1,290 ac)
Kauai 11— <i>Flueggea neowawraea</i> —a	51 ha (126 ac) .....	.....	.....	51 ha (126 ac)
Kauai 11— <i>Flueggea neowawraea</i> —b	47 ha (117 ac) .....	.....	.....	47 ha (117 ac)
Kauai 11— <i>Flueggea neowawraea</i> —c	152 ha (376 ac) .....	.....	.....	152 ha (376 ac)
Kauai 11— <i>Flueggea neowawraea</i> —d	77 ha (191 ac) .....	.....	.....	77 ha (191 ac)
Kauai 11— <i>Flueggea neowawraea</i> —e	27 ha (67 ac) .....	.....	.....	27 ha (67 ac)
Kauai 11— <i>Flueggea neowawraea</i> —f	240 ha (594 ac) .....	.....	.....	240 ha (594 ac)
Kauai 11— <i>Gouania meyenii</i> —a	443 ha (1,094 ac) .....	.....	.....	443 ha (1,094 ac)
Kauai 11— <i>Gouania meyenii</i> —b	128 ha (316 ac) .....	.....	.....	128 ha (316 ac)
Kauai 11— <i>Gouania meyenii</i> —c	215 ha (532 ac) .....	.....	.....	215 ha (532 ac)
Kauai 11— <i>Hedyotis cookiana</i> —a	771 ha (1,905 ac) .....	.....	.....	771 ha (1,905 ac)
Kauai 11— <i>Hedyotis st. johnii</i> —a	238 ha (589 ac) .....	.....	.....	238 ha (589 ac)
Kauai 11— <i>Hesperomannia lydgatei</i> —b	314 ha (776 ac)	599 ha (1,480 ac) .....	.....	913 ha (2,257 ac)
Kauai 11— <i>Hesperomannia lydgatei</i> —c	79 ha (196 ac)	101 ha (249 ac) .....	.....	180 ha (444 ac)
Kauai 11— <i>Hibiscadelphus woodii</i> —a	278 ha (686 ac) .....	.....	.....	278 ha (686 ac)
Kauai 11— <i>Hibiscadelphus woodii</i> —b	72 ha (177 ac) .....	.....	.....	72 ha (177 ac)
Kauai 11— <i>Hibiscus waimeae</i> ssp. <i>hannerae</i> —a	565 ha (1,396 ac)	554 ha (1,370 ac) .....	.....	1,119 ha (2,765 ac)
Kauai 11— <i>Ischaemum byrone</i> —d	45 ha (111 ac) .....	.....	.....	45 ha (111 ac)
Kauai 11— <i>Isodendron laurifolium</i> —a	401 ha (991 ac) .....	.....	.....	401 ha (991 ac)
Kauai 11— <i>Isodendron laurifolium</i> —b	400 ha (988 ac) .....	.....	.....	400 ha (988 ac)
Kauai 11— <i>Isodendron longifolium</i> —c	59 ha (146 ac) .....	.....	.....	59 ha (146 ac)
Kauai 11— <i>Isodendron longifolium</i> —d	493 ha (1,218 ac) .....	.....	.....	493 ha (1,218 ac)
Kauai 11— <i>Isodendron longifolium</i> —e	279 ha (690 ac)	101 ha (251 ac) .....	.....	381 ha (941 ac)
Kauai 11— <i>Kokia kauaiensis</i> —a	155 ha (384 ac) .....	.....	.....	155 ha (384 ac)
Kauai 11— <i>Kokia kauaiensis</i> —b	30 ha (74 ac) .....	.....	.....	30 ha (74 ac)
Kauai 11— <i>Kokia kauaiensis</i> —c	667 ha (1,647 ac) .....	.....	.....	667 ha (1,647 ac)
Kauai 11— <i>Kokia kauaiensis</i> —d	126 ha (312 ac) .....	.....	.....	126 ha (312 ac)
Kauai 11— <i>Labordia lydgatei</i> —c	325 ha (803 ac) .....	.....	.....	325 ha (803 ac)
Kauai 11— <i>Labordia lydgatei</i> —d	82 ha (203 ac) .....	.....	.....	82 ha (203 ac)
Kauai 11— <i>Labordia lydgatei</i> —e	6 ha (16 ac)	111 ha (275 ac) .....	.....	117 ha (290 ac)
Kauai 11— <i>Lipochaeta fauriei</i> —a	106 ha (262 ac) .....	.....	.....	106 ha (262 ac)
Kauai 11— <i>Lipochaeta fauriei</i> —b	545 ha (1,347 ac) .....	.....	.....	545 ha (1,347 ac)
Kauai 11— <i>Lipochaeta micrantha</i> —b	212 ha (523 ac) .....	.....	.....	212 ha (523 ac)
Kauai 11— <i>Lobelia niihauensis</i> —a	89 ha (220 ac) .....	.....	.....	89 ha (220 ac)
Kauai 11— <i>Lobelia niihauensis</i> —b	1,854 ha (4,582 ac)	147 ha (362 ac) .....	.....	2,001 ha (4,944 ac)
Kauai 11— <i>Mariscus pennatifolius</i> —a	1,003 ha (2,479 ac) .....	.....	.....	1,003 ha (2,479 ac)
Kauai 11— <i>Melicope haupuensis</i> —b	574 ha (1,418 ac) .....	.....	.....	574 ha (1,418 ac)
Kauai 11— <i>Melicope haupuensis</i> —c	290 ha (716 ac) .....	.....	.....	290 ha (716 ac)
Kauai 11— <i>Melicope knudsenii</i> —a	966 ha (2,388 ac) .....	.....	.....	966 ha (2,388 ac)
Kauai 11— <i>Melicope knudsenii</i> —b	373 ha (922 ac) .....	.....	.....	373 ha (922 ac)
Kauai 11— <i>Melicope pallida</i> —a	143 ha (353 ac) .....	.....	.....	143 ha (353 ac)
Kauai 11— <i>Melicope pallida</i> —b	310 ha (765 ac) .....	.....	.....	310 ha (765 ac)
Kauai 11— <i>Munroidendron racemosum</i> —c	1,921 ha (4,747 ac)	29 ha (72 ac) .....	.....	1,950 ha (4,819 ac)
Kauai 11— <i>Munroidendron racemosum</i> —d	153 ha (379 ac) .....	.....	.....	153 ha (379 ac)
Kauai 11— <i>Myrsine linearifolia</i> —c	684 ha (1,691 ac) .....	.....	.....	684 ha (1,691 ac)

TABLE 4.—APPROXIMATE CRITICAL HABITAT AREA DESIGNATED BY UNIT AND LANDOWNERSHIP OR JURISDICTION, KAUAI COUNTY, HAWAII—Continued

Unit name	State/local	Private	Federal	Total
Kauai 11— <i>Myrsine linearifolia</i> —d	125 ha (309 ac)	161 ha (397 ac) .....	.....	286 ha (707 ac)
Kauai 11— <i>Myrsine linearifolia</i> —e	346 ha (854 ac) .....	.....	.....	346 ha (854 ac)
Kauai 11— <i>Myrsine linearifolia</i> —f	56 ha (139 ac)	79 ha (195 ac) .....	.....	135 ha (334 ac)
Kauai 11— <i>Nothocestrum peltatum</i> —a	427 ha (1,056 ac) .....	.....	.....	427 ha (1,056 ac)
Kauai 11— <i>Nothocestrum peltatum</i> —b	1,464 ha (3,617 ac) .....	.....	.....	1,464 ha (3,617 ac)
Kauai 11— <i>Nothocestrum peltatum</i> —c	80 ha (198 ac) .....	.....	.....	80 ha (198 ac)
Kauai 11— <i>Peucedanum sandwicense</i> —b	579 ha (1,430 ac) .....	.....	.....	579 ha (1,430 ac)
Kauai 11— <i>Peucedanum sandwicense</i> —c	181 ha (447 ac) .....	.....	.....	181 ha (447 ac)
Kauai 11— <i>Phyllostegia knudsenii</i> —a	297 ha (735 ac) .....	.....	.....	297 ha (735 ac)
Kauai 11— <i>Phyllostegia waimeae</i> —a	364 ha (901 ac) .....	.....	.....	364 ha (901 ac)
Kauai 11— <i>Phyllostegia wawrana</i> —b	973 ha (2,406 ac)	63 ha (156 ac) .....	.....	1,037 ha (2,562 ac)
Kauai 11— <i>Phyllostegia wawrana</i> —c	108 ha (268 ac) .....	.....	.....	108 ha (268 ac)
Kauai 11— <i>Phyllostegia wawrana</i> —d	251 ha (619 ac) .....	.....	.....	251 ha (619 ac)
Kauai 11— <i>Plantago princeps</i> —b	126 ha (312 ac) .....	.....	.....	126 ha (312 ac)
Kauai 11— <i>Plantago princeps</i> —c	244 ha (603 ac) .....	.....	.....	244 ha (603 ac)
Kauai 11— <i>Plantago princeps</i> —d	77 ha (189 ac) .....	.....	.....	77 ha (189 ac)
Kauai 11— <i>Platanthera holochila</i> —a	4,053 ha (10,014 ac)	94 ha (232 ac) .....	.....	4,146 ha (10,246 ac)
Kauai 11— <i>Poa mannii</i> —a	1,871 ha (4,624 ac) .....	.....	.....	1,871 ha (4,624 ac)
Kauai 11— <i>Poa mannii</i> —b	677 ha (1,673 ac) .....	.....	.....	677 ha (1,673 ac)
Kauai 11— <i>Poa mannii</i> —c	155 ha (382 ac) .....	.....	.....	155 ha (382 ac)
Kauai 11— <i>Poa mannii</i> —d	307 ha (758 ac) .....	.....	.....	307 ha (758 ac)
Kauai 11— <i>Poa sandwicensis</i> —a	1,111 ha (2,745 ac) .....	.....	.....	1,111 ha (2,745 ac)
Kauai 11— <i>Poa sandwicensis</i> —b	52 ha (129 ac) .....	.....	.....	52 ha (129 ac)
Kauai 11— <i>Poa siphonoglossa</i> —a	1,621 ha (4,006 ac) .....	.....	.....	1,621 ha (4,006 ac)
Kauai 11— <i>Poa siphonoglossa</i> —b	2,189 ha (5,408 ac) .....	.....	.....	2,189 ha (5,408 ac)
Kauai 11— <i>Pteralyxia kauaiensis</i> —c	209 ha (516 ac) .....	.....	.....	209 ha (516 ac)
Kauai 11— <i>Pteralyxia kauaiensis</i> —d	57 ha (141 ac) .....	.....	.....	57 ha (141 ac)
Kauai 11— <i>Pteralyxia kauaiensis</i> —e	353 ha (872 ac) .....	.....	.....	353 ha (872 ac)
Kauai 11— <i>Pteralyxia kauaiensis</i> —f	588 ha (1,453 ac)	<1 ha (<1 ac) .....	.....	588 ha (1,453 ac)
Kauai 11— <i>Pteralyxia kauaiensis</i> —g	445 ha (1,100 ac) .....	.....	.....	445 ha (1,100 ac)
Kauai 11— <i>Remya kauaiensis</i> —a	172 ha (426 ac) .....	.....	.....	172 ha (426 ac)
Kauai 11— <i>Remya kauaiensis</i> —b	66 ha (163 ac) .....	.....	.....	66 ha (163 ac)
Kauai 11— <i>Remya kauaiensis</i> —c	886 ha (2,190 ac) .....	.....	.....	886 ha (2,190 ac)
Kauai 11— <i>Remya kauaiensis</i> —d	47 ha (115 ac) .....	.....	.....	47 ha (115 ac)
Kauai 11— <i>Remya kauaiensis</i> —e	66 ha (163 ac) .....	.....	.....	66 ha (163 ac)
Kauai 11— <i>Remya montgomeryi</i> —a	69 ha (171 ac) .....	.....	.....	69 ha (171 ac)
Kauai 11— <i>Remya montgomeryi</i> —b	1,010 ha (2,496 ac) .....	.....	.....	1,010 ha (2,496 ac)
Kauai 11— <i>Remya montgomeryi</i> —c	435 ha (1,076 ac) .....	.....	.....	435 ha (1,076 ac)
Kauai 11— <i>Schiedea apokremnos</i> —a	170 ha (420 ac) .....	.....	.....	170 ha (420 ac)
Kauai 11— <i>Schiedea apokremnos</i> —b	187 ha (463 ac) .....	.....	.....	187 ha (463 ac)
Kauai 11— <i>Schiedea apokremnos</i> —c	295 ha (730 ac) .....	.....	.....	295 ha (730 ac)
Kauai 11— <i>Schiedea helleri</i> —a	483 ha (1,194 ac) .....	.....	.....	483 ha (1,194 ac)
Kauai 11— <i>Schiedea helleri</i> —b	154 ha (381 ac) .....	.....	.....	154 ha (381 ac)
Kauai 11— <i>Schiedea helleri</i> —c	172 ha (426 ac) .....	.....	.....	172 ha (426 ac)
Kauai 11— <i>Schiedea kauaiensis</i> —a .....	.....	12 ha (29 ac) .....	.....	12 ha (29 ac)
Kauai 11— <i>Schiedea kauaiensis</i> —b	394 ha (974 ac) .....	.....	.....	394 ha (974 ac)
Kauai 11— <i>Schiedea kauaiensis</i> —c	510 ha (1,260 ac) .....	.....	.....	510 ha (1,260 ac)
Kauai 11— <i>Schiedea kauaiensis</i> —d	11 ha (28 ac) .....	.....	.....	11 ha (28 ac)
Kauai 11— <i>Schiedea membranacea</i> —a	251 ha (620 ac) .....	.....	.....	251 ha (620 ac)
Kauai 11— <i>Schiedea membranacea</i> —b	234 ha (579 ac) .....	.....	.....	234 ha (579 ac)
Kauai 11— <i>Schiedea membranacea</i> —c	527 ha (1,303 ac) .....	.....	.....	527 ha (1,303 ac)
Kauai 11— <i>Schiedea membranacea</i> —d	327 ha (809 ac) .....	.....	.....	327 ha (809 ac)
Kauai 11— <i>Schiedea spergulina</i> var. <i>spergulina</i> —a	131 ha (323 ac) .....	.....	.....	131 ha (323 ac)
Kauai 11— <i>Schiedea spergulina</i> var. <i>spergulina</i> —b	77 ha (191 ac) .....	.....	.....	77 ha (191 ac)
Kauai 11— <i>Schiedea stellarioides</i> —a	1,259 ha (3,112 ac) .....	.....	.....	1,259 ha (3,112 ac)
Kauai 11— <i>Schiedea stellarioides</i> —b	129 ha (320 ac) .....	.....	.....	129 ha (320 ac)
Kauai 11— <i>Solanum sandwicense</i> —a	2,443 ha (6,037 ac) .....	.....	.....	2,443 ha (6,037 ac)
Kauai 11— <i>Solanum sandwicense</i> —b	249 ha (614 ac) .....	.....	.....	249 ha (614 ac)
Kauai 11— <i>Spermolepis hawaiiensis</i> —a	96 ha (237 ac) .....	.....	.....	96 ha (237 ac)
Kauai 11— <i>Stenogyne campanulata</i> —a	425 ha (1,050 ac) .....	.....	.....	425 ha (1,050 ac)
Kauai 11— <i>Wilkesia hobbii</i> —a	775 ha (1,914 ac) .....	.....	.....	775 ha (1,914 ac)
Kauai 11— <i>Xylosma crenatum</i> —a	840 ha (2,076 ac) .....	.....	.....	840 ha (2,076 ac)
Kauai 11— <i>Zanthoxylum hawaiiense</i> —a	523 ha (1,292 ac) .....	.....	.....	523 ha (1,292 ac)
Kauai 12— <i>Nothocestrum peltatum</i> —d	162 ha (400 ac) .....	.....	.....	162 ha (400 ac)
Kauai 12— <i>Remya kauaiensis</i> —f	52 ha (128 ac) .....	.....	.....	52 ha (128 ac)
Kauai 12— <i>Xylosma crenatum</i> —b	52 ha (128 ac) .....	.....	.....	52 ha (128 ac)
Kauai 13— <i>Lipochaeta waimeae</i> —a	56 ha (139 ac) .....	.....	.....	56 ha (139 ac)
Kauai 13— <i>Schiedea spergulina</i> var. <i>spergulina</i> —c	221 ha (545 ac) .....	.....	.....	221 ha (545 ac)
Kauai 13— <i>Spermolepis hawaiiensis</i> —b	87 ha (215 ac) .....	.....	.....	87 ha (215 ac)
Kauai 14— <i>Panicum niihauense</i> —a	79 ha (196 ac) .....	.....	40 ha (99 ac)	119 ha (294 ac)
Kauai 14— <i>Sesbania tomentosa</i> —b	44 ha (109 ac) .....	.....	.....	44 ha (109 ac)

TABLE 4.—APPROXIMATE CRITICAL HABITAT AREA DESIGNATED BY UNIT AND LANDOWNERSHIP OR JURISDICTION, KAUAI COUNTY, HAWAII—Continued

Unit name	State/local	Private	Federal	Total
Kauai 15— <i>Panicum niihauense</i> —b .....	.....	.....	15 ha (38 ac)	15 ha (38 ac)
Kauai 16— <i>Panicum niihauense</i> —c .....	.....	.....	11 ha (28 ac)	11 ha (28 ac)
Kauai 17— <i>Panicum niihauense</i> —d	23 ha (56 ac) .....	.....	5 ha (12 ac)	28 ha (68 ac)
Niihau 1— <i>Brighamia insignis</i> —a .....	.....	144 ha (357 ac) .....	.....	.....
Grand Total*	14,814 ha (36,606 ac).	6,360 ha (15,717 ac)	72 ha (177 ac)	21,266 ha (52,549 ac)

*Totals take into consideration overlapping individual species units.

If a species is listed or critical habitat is designated, section 7(a)(2) of the Act requires Federal agencies to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of such a species or destroy or adversely modify its 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. Through this consultation, the action agency would ensure that the permitted actions do not destroy or adversely modify critical habitat.

Regulations at 50 CFR 402.16 require Federal agencies to reinstitute 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 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 critical habitat of one or more of the 83 plant species from Kauai and Niihau 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 will also continue to be subject to the section 7 consultation process. Federal actions not affecting critical habitat and actions on non-Federal lands that are not federally funded, authorized, or permitted do not require section 7 consultation.

Section 4(b)(8) of the Act requires us to briefly describe and evaluate in any proposed or final regulation that designates critical habitat those activities involving a Federal action that may adversely modify such habitat or that may be affected by such designation. We note that such activities may also jeopardize the continued existence of the species.

Activities that, when carried out, funded, or authorized by a Federal agency, may directly or indirectly 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 water diversion or impoundment, excess groundwater pumping, 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 effects on the listed species and the primary constituent elements of their habitat.

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, Branch of Endangered Species/Permits, 911 N.E. 11th Ave., Portland, Oregon 97232-4181 (telephone 503/231-2063; facsimile 503/231-6243).

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 and commercial information available and to consider the economic and other relevant impacts of designating a particular area as critical habitat. We may exclude areas from critical habitat upon a determination that the benefits of such exclusions outweigh the benefits of specifying such areas as critical habitat. We cannot exclude areas from critical habitat when such exclusion will result in the extinction of the species concerned.

Following the publication of the revised proposed critical habitat designation on January 28, 2002, a draft economic analysis was conducted to estimate the potential economic impact of the designation, in accordance with recent decisions in the N.M.

Cattlegrowers Ass'n v. U.S. Fish and Wildlife Serv., 248 F.3d 1277 (10th Cir. 2001). The draft analysis was made available for review on May 28, 2002 (67 FR 36851). We accepted comments on the draft analysis until the comment period closed on September 30, 2002.

Our draft economic analysis evaluated the potential future effects of section 7 of the Act associated with the listing of the 83 species (*Adenophorus periens*, *Alectryon macrococcus*, *Alsinidendron lychnoides*, *Alsinidendron viscosum*, *Bonamia menziesii*, *Brighamia insignis*, *Centaurium sebaeoides*, *Chamaesyce halemanui*, *Ctenitis squamigera*, *Cyanea asarifolia*, *Cyanea recta*, *Cyanea remyi*, *Cyanea undulata*, *Cyperus trachysanthos*, *Cyrtandra cyaneoides*, *Cyrtandra limahuliensis*, *Delissea rhytidisperma*, *Delissea rivularis*, *Delissea undulata*, *Diellia erecta*, *Diellia pallida*, *Diplazium molokaiense*, *Dubautia latifolia*, *Dubautia pauciflora*, *Euphorbia haeleleana*, *Exocarpos luteolus*, *Flueggea neowawraea*, *Gouania meyenii*, *Hedyotis cookiana*, *Hedyotis st.-johnii*, *Hesperomannia lydgatei*, *Hibiscadelphus woodii*, *Hibiscus clayi*, *Hibiscus waimeae* ssp. *hannerae*, *Ischaemum byrone*, *Isodendron laurifolium*, *Isodendron longifolium*, *Kokia kauaiensis*, *Labordia lydgatei*, *Labordia tinifolia* var. *wahiawaensis*, *Lipochaeta fauriei*, *Lipochaeta micrantha*, *Lipochaeta waimeaensis*, *Lobelia niihauensis*, *Lysimachia filifolia*, *Mariscus pennatifolius*, *Melicope haupuensis*, *Melicope knudsenii*, *Melicope pallida*, *Munroidendron racemosum*, *Myrsine linearifolia*, *Nothocestrum peltatum*, *Panicum niihauense*, *Peucedanum*

sandwicense, *Phlegmariurus nutans*, *Phyllostegia knudsenii*, *Phyllostegia waimeae*, *Phyllostegia wawrana*, *Plantago princeps*, *Platanthera holochila*, *Poa mannii*, *Poa sandwicensis*, *Poa siphonoglossa*, *Pteralyxia kauaiensis*, *Remya kauaiensis*, *Remya montgomeryi*, *Schiedea apokremnos*, *Schiedea helleri*, *Schiedea kauaiensis*, *Schiedea membranacea*, *Schiedea nuttallii*, *Schiedea spergulina* var. *leiopoda*, *Schiedea spergulina* var. *spergulina*, *Schiedea stellarioides*, *Sesbania tomentosa*, *Solanum sandwicense*, *Spermolepis hawaiiensis*, *Stenogyne campanulata*, *Viola helenae*, *Viola kauaiensis* var. *wahiawaensis*, *Wilkesia hobdyi*, *Xylosma crenatum*, and *Zanthoxylum hawaiiense*), as well as any potential effect of the critical habitat designation above and beyond the impacts associated with listing. To quantify the proportion of total potential economic impacts attributable to the critical habitat designation, the analysis evaluated a "without critical habitat" baseline and compared it to a "with critical habitat" scenario. The "without critical habitat" baseline represented the current and expected economic activity under all modifications prior to the critical habitat designation, including protections afforded the species under Federal and State laws. The difference between the two scenarios measured the net change in economic activity attributable to the designation of critical habitat. The categories of potential costs considered in the analysis included the costs associated with: (1) Conducting section 7 consultations associated with the listing or with the critical habitat, including incremental consultations and technical assistance; (2) modifications to projects, activities, or land uses resulting from the section 7 consultations; (3) potential delays associated with reinitiating completed consultations after critical habitat is finalized; (4) uncertainty and public perceptions resulting in loss of land value from the designation of critical habitat; (5) potential effects on property values including potential indirect costs resulting from the loss of hunting opportunities and increased regulation related costs due to the interaction of State and local laws; and (6) potential offsetting benefits 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.

Following the close of the comment period on the draft economic analysis, a final addendum was completed which

incorporated public comments on the draft analysis and made other changes in the draft as necessary. Together, these constitute our final economic analysis. The addendum to the draft economic analysis estimates that, over the next 10 years, the designation may result in potential direct economic effects of between approximately \$178,200 and \$1,124,800, and concludes that economic impacts from the designation of critical habitat for the 83 species would not be significant. This is a reduction of between approximately \$799,700 and \$1,318,430 from the costs estimated in the original draft economic analysis, and is due to the exclusion of the proposed unit Kauai D1 from final designation and the significant reduction in size to proposed units Kauai A2, Kauai B, Kauai C, Kauai D2, Kauai E, Kauai G, Kauai H1, H2, and H3, Kauai I, Kauai J, Kauai K, Kauai L, Kauai M, Kauai N, Kauai O and Niihau A (designation of 21,410 ha (52,906 ac) versus the 40,429 ha (99,903 ac) proposed as critical habitat, a reduction of approximately 19,019 ha (46,997 ac)). As described in the analysis, direct costs result from section 7 consultations and project modifications at the Pacific Missile Range Facility while there is a small risk of compromising national defense as an indirect cost. Other indirect costs include: a reduction in State and County development approvals; a change in game management to reduce ungulates and as a result hunting activity; mandated conservation management; redistributing by the State of land in the Urban and Agricultural Districts to the Conservation District; and a loss in landowner participation in conservation projects. However, these indirect costs are not subject to accurate quantification and had slight to small probabilities of occurring. Therefore, we do not believe that they are significant. A more detailed discussion of our economic analysis is contained in the draft economic analysis and the addendum. Both documents are available for inspection at the Pacific Islands Fish and Wildlife Office (see **ADDRESSES** section).

No critical habitat units in the proposed rule were excluded or modified due to economic impacts. However, as described above, section 4(b)(2) of the Act requires us to consider other relevant impacts, in addition to economic impacts, of designating critical habitat. No critical habitat units were excluded or modified due to non-economic impacts. (While units were excluded or reduced, as noted above, because they lacked primary constituent

elements or were more degraded than other available proposed or designated habitat for the species.) Thus this final rule represents no increase in impacts beyond the revised proposed rule.

Taxonomic Changes

At the time we listed *Cyrtandra limahuliensis*, *Delissea undulata*, *Hibiscus brackenridgei*, *Lipochaeta fauriei*, *Lipochaeta micrantha*, *Lipochaeta waimeaensis*, and *Mariscus pennatifolius*, we followed the taxonomic treatments in Wagner *et al.* (1990), the widely used and accepted *Manual of the Flowering Plants of Hawaii*. Subsequent to the final listing, we became aware of new taxonomic treatments of these species. Also, the soon-to-be-published book *Hawaii's Ferns and Fern Allies* (Palmer, in press) has changed the family name for *Ctenitis squamigera* (from Aspleniaceae to Dryopteridaceae). Due to the court-ordered deadlines, we are required to publish this final rule to designate critical habitat on Kauai and Niihau before we can prepare and publish a notice of taxonomic changes for these eight species. We plan to publish a taxonomic change notice for these eight species after we have published the final critical habitat designations on Kauai and Niihau.

Required Determinations

Regulatory Planning and Review

In accordance with Executive Order 12866, the Office of Management and Budget (OMB) has determined that this is a significant regulatory action because it may raise novel legal or policy issues. As required by the executive order, we have provided a copy of the rule, which describes the need for this action and how designation meets that need and the economic analysis, which assesses the costs and benefits of this critical habitat designation, to OMB for review. OMB did not recommend or make any changes in this regulatory action.

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

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.

Federal courts and Congress have indicated that an RFA/SBREFA analysis may be limited to all impacts to entities directly subject to the requirements of the regulation (Service 2002). 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.

In today's rule, we are certifying that the designation of critical habitat for the 83 Kauai and Niihau species will not have a significant effect on a substantial number of small entities. The following discussion explains our rationale.

Small entities include small organizations, such as independent non-profit organizations, and small governmental jurisdictions, including school boards and city and town governments that serve fewer than 50,000 residents, as well as small businesses. Small businesses include manufacturing and mining concerns with fewer than 500 employees, wholesale trade entities with fewer than 100 employees, retail and service businesses with less than \$5 million in annual sales, general and heavy construction businesses with less than \$27.5 million in annual business, special trade contractors doing less than \$11.5 million in annual business, and agricultural businesses with annual sales less than \$750,000. To determine if potential economic impacts to these small entities are significant, we consider the types of activities that might trigger regulatory impacts under this rule as well as the types of project modifications that may result. In general, the term "significant economic impact" is meant to apply to a typical small business firm's business operations.

To determine if the rule would affect a substantial number of small entities, we consider the number of small entities affected within particular types of economic activities (*e.g.*, housing development, grazing, oil and gas production, timber harvesting, etc.). We apply the "substantial number" test individually to each industry to determine if certification is appropriate. In estimating the numbers of small entities potentially affected, we also

consider whether their activities have any Federal involvement; some kinds of activities are unlikely to have any Federal involvement and so will not be affected by critical habitat designation.

Designation of critical habitat only affects activities conducted, funded, or permitted by Federal agencies; non-Federal activities are not affected by the designation. In areas where the species are present, Federal agencies are already required to consult with us under section 7 of the Act on activities that they fund, permit, or implement that may affect any one of the 83 species. Federal agencies must also consult with us if their activities may affect critical habitat. However, in areas where the species are present, we do not believe that this will result in any additional regulatory burden on Federal agencies or their applicants because consultation would already be required due to the presence of the listed species, and the duty to avoid adverse modification of critical habitat likely would not trigger additional regulatory impacts beyond the duty to avoid jeopardizing the species.

Even if the duty to avoid adverse modification does not trigger additional regulatory impacts in areas where the species is present, designation of critical habitat could result in an additional economic burden on small entities due to the requirement to reinstitute consultation for ongoing Federal activities. However, since these 83 plant species were listed (between 1991 and 1996), there have been no formal consultations, and we have conducted only six informal consultations, in addition to consultations on Federal grants to State wildlife programs, which would not affect small entities. On the island of Kauai the six informal consultations have concerned nine of the 83 species (*Alsinidendron lychnoides*, *Cyanea recta*, *Cyrtandra limahuliensis*, *Diellia erecta*, *Dubautia latifolia*, *Exocarpos luteolus*, *Panicum niihauense*, *Sesbania tomentosa*, and *Wilkesia hobbeyi*) and were conducted with the Corps, Navy, and the U.S. Department of Agriculture. One informal consultation was conducted on behalf of the Corps for the Defense Environmental Restoration Program, who requested a list of endangered species on a site formerly used by the Department of Defense at the Wailua Impact Area. Three of the 83 species, *Cyanea recta*, *Cyrtandra limahuliensis*, and *Exocarpos luteolus*, were reported from the project area. Four informal consultations were conducted with the Navy: one for the construction of a missile support facility at the PMRF at Barking Sands regarding several listed

animals and *Sesbania tomentosa*; one on the PMRF's Enhanced Capability regarding several listed animals and *Panicum niihauense* and *Sesbania tomentosa*; one for the mountaintop surveillance sensor test integration center facility at PMRF at Barking Sands regarding several listed animals and *Panicum niihauense*, and *Sesbania tomentosa*; and one for the Navy's INRMP for PMRF at Barking Sands regarding several listed animals and *Wilkesia hobyi* at Makaha Ridge. In addition, *Panicum niihauense* and *Sesbania tomentosa* were identified as occurring in Polihale State Park, adjacent to the Naval facility. The sixth informal consultation was conducted on several listed animals, *Alsinidendron lychnoides*, *Diellia erecta*, and *Dubautia latifolia* with the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) through their Wildlife Incentive Program for noxious weed control actions on leased cabin lots within Kokee State Park. NRCS does not anticipate the need to reinstate consultation for these on-going actions as they are not occurring within the areas of designated critical habitat (Terrell Kelly, NRCS, pers. comm., 2001).

Except for the NRCS project, none of these consultations affected or concerned small entities. However, the NRCS project is not occurring within the designated critical habitat. In all six consultations, we concurred with each agency's determination that the project, as proposed, was not likely to adversely affect listed species. With the exception of the NRCS project, none of the other consultations affected or concerned small entities, and none of the proposed projects are ongoing. As a result, the requirement to reinstate consultation for ongoing projects will not affect a substantial number of small entities on Kauai.

There have been no consultations on any of these 83 species on the island of Niihau. Therefore, the requirement to reinstate consultations for ongoing projects will not affect a substantial number of small entities on Niihau.

In areas where the species is clearly not present, designation of critical habitat could trigger additional review of Federal activities under section 7 that would otherwise not be required. However, there will be little additional impact on State and local governments and their activities because all but one of the critical habitat areas are occupied by at least one species. Other than the federally funded PMRF and NRCS projects, we are aware of relatively few activities in the designated critical habitat areas for these 83 plants that

have Federal involvement, and thus, would require consultation for ongoing projects. As mentioned above, we have conducted no formal consultations and only six informal consultations under section 7 on Kauai to date which involved only nine of the 83 species. As a result, we cannot easily identify future consultations that may be due to the listing of the species or the increment of additional consultations that may be required by this critical habitat designation. Therefore, for the purposes of this review and certification under the Regulatory Flexibility Act, we are assuming that any future consultations in the area designated as critical habitat will be due to the critical habitat designations.

On Kauai, the designations are on Federal, State, or private land. 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. Almost all of this land (nearly 100 percent) is within the State Conservation District where State land-use controls severely limit development and most activities. Less than one percent of this land is within the State Agricultural District, and less than one percent is within the State Rural District. On non-Federal lands, activities that lack Federal involvement would not be affected by the critical habitat designations. However, activities of an economic nature that are likely to occur on non-Federal lands in the area encompassed by these designations consist of improvements in communications and tracking facilities; ranching; road improvements; recreational use, such as hiking, camping, picnicking, game hunting, and fishing; botanical gardens; and crop farming. With the exception of communications and tracking facilities improvements by the FAA or the Federal Communications Commission, these activities are unlikely to have Federal involvement. On lands that are in agricultural production, the types of activities that might trigger a consultation include irrigation ditch system projects that may require section 404 authorizations from the Corps, and watershed management and restoration projects sponsored by NRCS. However the NRCS restoration projects typically are voluntary, and the irrigation ditch system projects within lands that are in agricultural production are rare and may affect only a small percentage of the small entities within these critical habitat designations.

Land that are within the State Urban District are primarily located within undeveloped coastal areas. The types of

activities that might trigger a consultation include shoreline restoration or modification projects that may require section 404 authorizations from the Corps or FEMA, housing or resort development that may require permits from the Department of Housing and Urban Development, small farms that may receive funding or require authorizations from the Department of Agriculture, watershed management and restoration projects sponsored by NRCS, and activities funded or authorized by the EPA. However, we are not aware of a significant number of future activities that would require Federal funds, permits, or authorizations in these coastal areas. Therefore, we conclude that the rule would not affect a substantial number of small entities. We are not aware of any commercial activities on the Federal lands included in these critical habitat designations.

The entire island of Niihau is under one private ownership and within the State Agricultural District. The current and projected land uses on Niihau are cattle and sheep ranching, commercial game hunting, and military exercises to train downed combat pilots on how to evade capture (Decision Analysts Hawaii (DAHI) 2001). The rule would not affect a substantial number of small agricultural entities on the island of Niihau. Therefore, we conclude that the rule would not affect a substantial number of small entities.

We also considered the likelihood that this rule would result in significant economic impacts to small entities. In general, two different mechanisms in section 7 consultations could lead to additional regulatory requirements. First, if we conclude, in a biological opinion, that a proposed action is likely to jeopardize the continued existence of a species or adversely modify its critical habitat, we can offer "reasonable and prudent alternatives." Reasonable and prudent alternatives are alternative actions that can be implemented in a manner consistent with the scope of the Federal agency's legal authority and jurisdiction, that are economically and technologically feasible, and that would avoid jeopardizing the continued existence of listed species or resulting in adverse modification of critical habitat. A Federal agency and an applicant may elect to implement a reasonable and prudent alternative associated with a biological opinion that has found jeopardy or adverse modification of critical habitat. An agency or applicant could alternatively choose to seek an exemption from the requirements of the Act or proceed without implementing the reasonable and prudent alternative. However, unless an exemption were

obtained, the Federal agency or applicant would be at risk of violating section 7(a)(2) of the Act if it chose to proceed without implementing the reasonable and prudent alternatives. Second, if we find that a proposed action is not likely to jeopardize the continued existence of a listed animal species, we may identify reasonable and prudent measures designed to minimize the amount or extent of take and require the Federal agency or applicant to implement such measures through non-discretionary terms and conditions. However, the Act does not prohibit the take of listed plant species or require terms and conditions to minimize adverse effect on critical habitat. We may also identify discretionary conservation recommendations designed to minimize or avoid the adverse effects of a proposed action on listed species or critical habitat, help implement recovery plans, or to develop information that could contribute to the recovery of the species.

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. As we have a very limited consultation history for these 83 species from Kauai and Niihau, we can only describe the general kinds of actions that may be identified in future reasonable and prudent alternatives. These are based on our understanding of the needs of these species and the threats they face, especially as described in the final listing rules and in this critical habitat designation, as well as our experience with similar listed plants in Hawaii. In addition, all of these species are protected under the State of Hawaii's Endangered Species Act (Hawaii Revised Statutes, Chap. 195D–4). Therefore, we have also considered the kinds of actions required under the State licensing process for these species. The kinds of actions that may be included in future reasonable and prudent alternatives include conservation set-asides; management of competing nonnative species; restoration of degraded habitat; propagation; outplanting and augmentation of existing populations;

construction of protective fencing; and periodic monitoring. These measures are not likely to result in a significant economic impact to a substantial number of small entities because any measure included as a reasonable and prudent alternative would have to be economically feasible to an individual landowner, and because as discussed above, we do not believe there will be a substantial number of small entities affected by the Act's consultation requirements.

In summary, we have considered whether this final rule would result in a significant economic effect on a substantial number of small entities and have concluded that it would not affect a substantial number of small entities. Approximately 70 percent of the lands designated as critical habitat are State lands. The State of Hawaii is not a small entity. Less than one percent of the lands designated as critical habitat are Federal lands. The Federal Government is not a small entity. Approximately 30 percent of the lands designated as critical habitat are private lands. Many of these parcels are located in areas where likely future land uses are not expected to result in Federal involvement or section 7 consultations. As discussed earlier, most of the private and State parcels within the designation are currently being used for recreational and agricultural purposes and, therefore, are not likely to require any Federal authorization. In the remaining areas, Federal involvement—and thus section 7 consultations, the only trigger for economic impact under this rule—would be limited to a subset of the area being designated. The most likely future section 7 consultations resulting from this rule would be for informal consultations on federally funded land and water conservation projects, species-specific surveys and research projects, and watershed management and restoration projects sponsored by NRCS and the Service. These consultations would likely occur on only a subset of the total number of parcels and therefore would not be likely to affect a substantial number of small entities. This rule would result in project modifications only when proposed Federal activities would destroy or adversely modify critical habitat. While this may occur, it is not expected frequently enough to affect a substantial number of small entities. Even when it does occur, we do not expect it to result in a significant economic impact, as the measures included in reasonable and prudent alternatives must be economically feasible and consistent with the

proposed action. Therefore, we are certifying that the designation of critical habitat for *Adenophorus periens*, *Alectryon macrococcus*, *Alsinidendron lychnoides*, *Alsinidendron viscosum*, *Bonamia menziesii*, *Brighamia insignis*, *Centaurium sebaeoides*, *Chamaesyce halemanui*, *Ctenitis squamigera*, *Cyanea asarifolia*, *Cyanea recta*, *Cyanea remyi*, *Cyanea undulata*, *Cyperus trachysanthos*, *Cyrtandra cyaneoides*, *Cyrtandra limahuliensis*, *Delissea rhytidospenna*, *Delissea rivularis*, *Delissea undulata*, *Diellia erecta*, *Diellia pallida*, *Diplazium molokaiense*, *Dubautia latifolia*, *Dubautia pauciflora*, *Euphorbia haeleeleana*, *Exocarpos luteolus*, *Flueggea neowawraea*, *Gouania meyenii*, *Hedyotis cookiana*, *Hedyotis st.-johnii*, *Hesperomannia lydgatei*, *Hibiscadelphus woodii*, *Hibiscus clayi*, *Hibiscus waimeae* ssp. *hannerae*, *Ischaemum byrone*, *Isodendron laurifolium*, *Isodendron longifolium*, *Kokia kauaiensis*, *Labordia lydgatei*, *Labordia tinifolia* var. *wahiawaensis*, *Lipochaeta fauriei*, *Lipochaeta micrantha*, *Lipochaeta waimeae*, *Lobelia niihauensis*, *Lysimachia filifolia*, *Mariscus pennatifolius*, *Melicope haupuensis*, *Melicope knudsenii*, *Melicope pallida*, *Munroidendron racemosum*, *Myrsine linearifolia*, *Nothoestrum peltatum*, *Panicum niihauense*, *Peucedanum sandwicense*, *Phlegmariurus nutans*, *Phyllostegia knudsenii*, *Phyllostegia waimeae*, *Phyllostegia wawrana*, *Plantago princeps*, *Platanthera holochila*, *Poa mannii*, *Poa sandwicensis*, *Poa siphonoglossa*, *Pteralyxia kauaiensis*, *Remya kauaiensis*, *Remya montgomeryi*, *Schiedea apokremnos*, *Schiedea helleri*, *Schiedea kauaiensis*, *Schiedea membranacea*, *Schiedea nuttallii*, *Schiedea spargulina* var. *leiopoda*, *Schiedea spargulina* var. *spargulina*, *Schiedea stellarioides*, *Sesbania tomentosa*, *Solanum sandwicense*, *Spermolepis hawaiiensis*, *Stenogyne campanulata*, *Viola helenae*, *Viola kauaiensis* var. *wahiawaensis*, *Wilkesia hobdyi*, *Xylosma crenatum*, 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 and the

final addendum 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, 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. Although this rule is a significant regulatory action under Executive Order 12866, it is not expected 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 83 plant species 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 83 species from Kauai and Niihau 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 Interior’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 83 plant species from Kauai and Niihau.

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 83 plant species.

Therefore, designation of critical habitat for these 83 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 follows:

a. Under the table's heading FLOWERING PLANTS, by revising the entries for *Alectryon macrococcus*, *Alsinidendron lychnoides*, *Alsinidendron viscosum*, *Bonamia menziesii*, *Brighamia insignis*, *Centaurium sebaeoides*, *Chamaesyce halemanui*, *Cyanea asarifolia*, *Cyanea recta*, *Cyanea remyi*, *Cyanea undulata*, *Cyperus trachysanthos*, *Cyrtandra cyaneoides*, *Cyrtandra limahuliensis*, *Delissea rhytidisperma*, *Delissea rivularis*, *Delissea undulata*, *Dubautia latifolia*, *Dubautia pauciflora*, *Euphorbia haeleeleana*, *Exocarpos*

luteolus, *Flueggea neowawraea*, *Gouania meyenii*, *Hedyotis cookiana*, *Hedyotis st.-johnii*, *Hesperomannia lydgatei*, *Hibiscadelphus woodii*, *Hibiscus clayi*, *Hibiscus waimeae* ssp. *hannerae*, *Ischaemum byrone*, *Isodendron laurifolium*, *Isodendron longifolium*, *Kokia kauaiensis*, *Labordia lydgatei*, *Labordia tinifolia* var. *wahiawaensis*, *Lipochaeta fauriei*, *Lipochaeta micrantha*, *Lipochaeta waimeae*, *Lobelia niihauensis*, *Lysimachia filifolia*, *Mariscus pennatifolius*, *Melicope haupuensis*, *Melicope knudsenii*, *Melicope pallida*, *Munroidendron racemosum*, *Myrsine linearifolia*, *Nothocestrum peltatum*, *Panicum niihauense*, *Peucedanum sandwicense*, *Phyllostegia knudsenii*, *Phyllostegia waimeae*, *Phyllostegia wawrana*, *Plantago princeps*, *Platanthera holochila*, *Poa mannii*, *Poa sandwicensis*, *Poa siphonoglossa*, *Pteralyxia kauaiensis*, *Remya kauaiensis*, *Remya montgomeryi*, *Schiedea apokremnos*, *Schiedea helleri*,

Schiedea kauaiensis, *Schiedea membranacea*, *Schiedea nuttallii*, *Schiedea spargulina* var. *leiopoda*, *Schiedea spargulina* var. *spargulina*, *Schiedea stellarioides*, *Sesbania tomentosa*, *Solanum sandwicense*, *Spermolepis hawaiiensis*, *Stenogyne campanulata*, *Viola helenae*, *Viola kauaiensis* var. *wahiawaensis*, *Wilkesia hobdyi*, *Xylosma crenatum*, and *Zanthoxylum hawaiiense* to read as follows.

b. Under the table's heading FERNS AND ALLIES, by revising the entries for *Adenophorus periens*, *Ctenitis squamigera*, *Diellia erecta*, *Diellia pallida*, and *Diplazium molokaiense*, removing the entry for *Lycopodium* (= *Phlegmariurus*) *nutans*, and adding an entry for *Phlegmariurus nutans* to read as set forth below.

§ 17.12 Endangered and threatened plants.

* * * * *

(h) * * *

Species		Historic range	Family	Status	When listed	Critical habitat	Special rules
Scientific name	Common name						
FLOWERING PLANTS							
*	*	*	*	*	*		*
<i>Alectryon macrococcus.</i>	Mahoe	U.S.A. (HI)	Sapindaceae	E	467	17.99(a)(1)	NA
*	*	*	*	*	*		*
<i>Alsinidendron lychnoides.</i>	Kuawawaenohu	U.S.A. (HI)	Caryophyllaceae	E	590	17.99(a)(1)	NA
*	*	*	*	*	*		*
<i>Alsinidendron viscosum.</i>	None	U.S.A. (HI)	Caryophyllaceae	E	590	17.99(a)(1)	NA
*	*	*	*	*	*		*
<i>Bonamia menziesii</i> ...	None	U.S.A. (HI)	Convolvulaceae	E	559	17.99(a)(1)	NA
<i>Brighamia insignis</i>	Olulu	U.S.A. (HI)	Campanulaceae	E	530	17.99(a)(1) and (a)(2)	NA
*	*	*	*	*	*		*
<i>Centaurium sebaeoides.</i>	Awiwi	U.S.A. (HI)	Gentianaceae	E	448	17.99(a)(1)	NA
*	*	*	*	*	*		*
<i>Chamaesyce halemanui.</i>	None	U.S.A. (HI)	Euphorbiaceae	E	464	17.99(a)(1)	NA
*	*	*	*	*	*		*
<i>Cyanea asarifolia</i>	Haha	U.S.A. (HI)	Campanulaceae	E	530	17.99(a)(1)	NA
*	*	*	*	*	*		*
<i>Cyanea recta</i>	Haha	U.S.A (HI)	Campanulaceae	T	590	17.99(a)(1)	NA
<i>Cyanea remyi</i>	Haha	U.S.A (HI)	Campanulaceae	E	590	17.99(a)(1)	NA
*	*	*	*	*	*		*
<i>Cyanea undulata</i>	None	U.S.A. (HI)	Campanulaceae	E	436	17.99(a)(1)	NA

Species		Historic range	Family	Status	When listed	Critical habitat	Special rules
Scientific name	Common name						
<i>Cyperus trachysanthos</i> .	Puukaa	U.S.A. (HI)	Cyperaceae	E	592	17.99(a)(1)	NA
<i>Cyrtandra cyaneoides</i>	Mapele	U.S.A. (HI)	Gesneriaceae	E	590	17.99(a)(1)	NA
<i>Cyrtandra limahuliensis</i> .	Haiwale	U.S.A. (HI)	Gesneriaceae	T	530	17.99(a)(1)	NA
<i>Delissea rhytidosperra</i> .	None	U.S.A. (HI)	Campanulaceae	E	530	17.99(a)(1)	NA
<i>Delissea rivularis</i>	Oha	U.S.A. (HI)	Campanulaceae	E	590	17.99(a)(1)	NA
<i>Delissea undulata</i>	None	U.S.A. (HI)	Campanulaceae	E	593	17.99(a)(1)	NA
<i>Dubautia latifolia</i>	Naenae	U.S.A. (HI)	Asteraceae	E	464	17.99(a)(1)	NA
<i>Dubautia pauciflora</i>	Naenae	U.S.A. (HI)	Asteraceae	E	436	17.99(a)(1)	NA
<i>Euphorbia haeleeleana</i> .	Akoko	U.S.A. (HI)	Euphorbiaceae	E	592	17.99(a)(1)	NA
<i>Exocarpos luteolus</i> ...	Heau	U.S.A. (HI)	Santalaceae	E	530	17.99(a)(1)	NA
<i>Flueggea neowawraea</i> .	Mehamehame	U.S.A. (HI)	Euphorbiaceae	E	559	17.99(a)(1)	NA
<i>Gouania meyenii</i>	None	U.S.A. (HI)	Rhamnaceae	E	448	17.99(a)(1)	NA
<i>Hedyotis cookiana</i>	Awiiwi	U.S.A. (HI)	Rubiaceae	E	530	17.99(a)(1)	NA
<i>Hedyotis st.-johnii</i>	Na Pali beach hedyotis.	U.S.A. (HI)	Rubiaceae	E	441	17.99(a)(1)	NA
<i>Hesperomannia lydgatei</i> .	None	U.S.A. (HI)	Asteraceae	E	436	17.99(a)(1)	NA
<i>Hibiscadelphus woodii</i> .	Hau kuahiwi	U.S.A. (HI)	Malvaceae	E	590	17.99(a)(1)	NA
<i>Hibiscus clayi</i>	Clay's hibiscus	U.S.A. (HI)	Malvaceae	E	530	17.99(a)(1)	NA
<i>Hibiscus waimeae</i> ssp. <i>hannerae</i> .	Kokio keokeo	U.S.A. (HI)	Malvaceae	E	590	17.99(a)(1)	NA
<i>Ischaemum byrone</i> ...	Hilo ischaemum	U.S.A. (HI)	Poaceae	E	532	17.99(a)(1)	NA
<i>Isodendron laurifolium</i> .	Aupaka	U.S.A. (HI)	Violaceae	E	592	17.99(a)(1)	NA
<i>Isodendron longifolium</i> .	Aupaka	U.S.A. (HI)	Violaceae	T	592	17.99(a)(1)	NA
<i>Kokia kauaiensis</i>	Kokio	U.S.A. (HI)	Malvaceae	E	590	17.99(a)(1)	NA
<i>Labordia lydgatei</i>	Kamakahala	U.S.A. (HI)	Loganiaceae	E	436	17.99(a)(1)	NA

Species		Historic range	Family	Status	When listed	Critical habitat	Special rules
Scientific name	Common name						
<i>Labordia tinifolia</i> var. <i>wahiawaensis</i> .	Kamakahala	U.S.A. (HI)	Loganiaceae	E	590	17.99(a)(1)	NA
<i>Lipochaeta fauriei</i>	Nehe	U.S.A. (HI)	Asteraceae	E	530	17.99(a)(1)	NA
<i>Lipochaeta micrantha</i>	Nehe	U.S.A. (HI)	Asteraceae	E	530	17.99(a)(1)	NA
<i>Lipochaeta waimeaensis</i> .	Nehe	U.S.A. (HI)	Asteraceae	E	530	17.99(a)(1)	NA
<i>Lobelia niihauensis</i> ...	None	U.S.A. (HI)	Campanulaceae	E	448	17.99(a)(1)	NA
<i>Lysimachia filifolia</i>	None	U.S.A. (HI)	Primulaceae	E	530	17.99(a)(1)	NA
<i>Mariscus pennatiformis</i> .	None	U.S.A. (HI)	Cyperaceae	E	559	17.99(a)(1)	NA
<i>Melicope haupuensis</i>	Alani	U.S.A. (HI)	Rutaceae	E	530	17.99(a)(1)	NA
<i>Melicope knudsenii</i> ...	Alani	U.S.A. (HI)	Rutaceae	E	530	17.99(a)(1)	NA
<i>Melicope pallida</i>	Alani	U.S.A. (HI)	Rutaceae	E	530	17.99(a)(1)	NA
<i>Munroidendron racemosum</i> .	None	U.S.A. (HI)	Araliaceae	E	530	17.99(a)(1)	NA
<i>Myrsine linearifolia</i>	Kolea	U.S.A. (HI)	Myrsinaceae	T	590	17.99(a)(1)	NA
<i>Nothocestrum peltatum</i> .	Aiea	U.S.A. (HI)	Solanaceae	E	530	17.99(a)(1)	NA
<i>Panicum niihauense</i>	Lau ehū	U.S.A. (HI)	Poaceae	E	592	17.99(a)(1)	NA
<i>Peucedanum sandwicense</i> .	Makou	U.S.A. (HI)	Apiaceae	T	530	17.99(a)(1)	NA
<i>Phyllostegia knudsenii</i> .	None	U.S.A. (HI)	Lamiaceae	E	590	17.99(a)(1)	NA
<i>Phyllostegia waimeae</i>	None	U.S.A. (HI)	Lamiaceae	E	530	17.99(a)(1)	NA
<i>Phyllostegia wawrana</i>	None	U.S.A. (HI)	Lamiaceae	E	590	17.99(a)(1)	NA
<i>Plantago princeps</i>	Laukahi kuahiwi	U.S.A. (HI)	Plantaginaceae	E	559	17.99(a)(1)	NA
<i>Platanthera holochila</i>	None	U.S.A. (HI)	Orchidaceae	E	592	17.99(a)(1)	NA
<i>Poa mannii</i>	Mann's bluegrass	U.S.A. (HI)	Poaceae	E	558	17.99(a)(1)	NA
<i>Poa sandvicensis</i>	Hawaiian bluegrass ..	U.S.A. (HI)	Poaceae	E	464	17.99(a)(1)	NA
<i>Poa siphonoglossa</i> ...	None	U.S.A. (HI)	Poaceae	E	464	17.99(a)(1)	NA

Species		Historic range	Family	Status	When listed	Critical habitat	Special rules
Scientific name	Common name						
<i>Pteralyxia kauaiensis</i>	Kaulu	U.S.A. (HI)	Apocynaceae	E	530	17.99(a)(1)	NA
<i>Remya kauaiensis</i>	None	U.S.A. (HI)	Asteraceae	E	413	17.99(a)(1)	NA
<i>Remya montgomeryi</i>	None	U.S.A. (HI)	Asteraceae	E	413	17.99(a)(1)	NA
<i>Schiedea apokremnos</i>	Maolioli	U.S.A. (HI)	Caryophyllaceae	E	441	17.99(a)(1)	NA
<i>Schiedea helleri</i>	None	U.S.A. (HI)	Caryophyllaceae	E	590	17.99(a)(1)	NA
<i>Schiedea kauaiensis</i>	None	U.S.A. (HI)	Caryophyllaceae	E	592	17.99(a)(1)	NA
<i>Schiedea membranacea</i>	None	U.S.A. (HI)	Caryophyllaceae	E	590	17.99(a)(1)	NA
<i>Schiedea nuttallii</i>	None	U.S.A. (HI)	Caryophyllaceae	E	592	17.99(a)(1)	NA
<i>Schiedea spergulina</i> var. <i>leiopoda</i>	None	U.S.A. (HI)	Caryophyllaceae	E	530	17.99(a)(1)	NA
<i>Schiedea spergulina</i> var. <i>spergulina</i>	None	U.S.A. (HI)	Caryophyllaceae	E	530	17.99(a)(1)	NA
<i>Schiedea stellarioides</i>	Laulihilihi (=Maolioli)	U.S.A. (HI)	Caryophyllaceae	E	590	17.99(a)(1)	NA
<i>Sesbania tomentosa</i>	Ohai	U.S.A. (HI)	Fabaceae	E	559	17.99(a)(1)	NA
<i>Solanum sandwicense</i>	Aiakeakua, popolo	U.S.A. (HI)	Solanaceae	E	530	17.99(a)(1)	NA
<i>Spermolepis hawaiiensis</i>	None	U.S.A. (HI)	Apiaceae	E	559	17.99(a)(1)	NA
<i>Stenogyne campanulata</i>	None	U.S.A. (HI)	Lamiaceae	E	464	17.99(a)(1)	NA
<i>Viola helenae</i>	None	U.S.A. (HI)	Violaceae	E	436	17.99(a)(1)	NA
<i>Viola kauaiensis</i> var. <i>wahiawaensis</i>	Nani waialeale	U.S.A. (HI)	Violaceae	E	590	17.99(a)(1)	NA
<i>Wilkesia hobbeyi</i>	Dwarfiliau	U.S.A. (HI)	Asteraceae	E	473	17.99(a)(1)	NA
<i>Xylosma crenatum</i>	None	U.S.A. (HI)	Flacourtiaceae	E	464	17.99(a)(1)	NA
<i>Zanthoxylum hawaiiense</i>	Ae	U.S.A. (HI)	Rutaceae	E	532	17.99(a)(1)	NA

Species		Historic range	Family	Status	When listed	Critical habitat	Special rules
Scientific name	Common name						
*	*	*	*	*	*		*
FERNS AND ALLIES							
<i>Adenophorus periens</i>	Pendent kihi fern	U.S.A. (HI)	Grammitidaceae	E	559	17.99(a)(1)	NA
*	*	*	*	*	*	*	*
<i>Ctenitis squamigera</i> ..	Pauoa	U.S.A. (HI)	Aspleniaceae	E	553	17.99(a)(1)	NA
*	*	*	*	*	*	*	*
<i>Diellia erecta</i>	Asplenium-leaved diellia.	U.S.A. (HI)	Aspleniaceae	E	559	17.99(a)(1)	NA
*	*	*	*	*	*	*	*
<i>Diellia pallida</i>	None	U.S.A. (HI)	Aspleniaceae	E	530	17.99(a)(1)	NA
*	*	*	*	*	*	*	*
<i>Diplazium molokaiense</i> .	None	U.S.A. (HI)	Aspleniaceae	E	553	17.99(a)(1)	NA
*	*	*	*	*	*	*	*
<i>Phlegmariurus nutans</i>	Wawaeiole	U.S.A. (HI)	Lycopodiaceae	E	536	17.99(a)(1)	NA
*	*	*	*	*	*	*	*

3. Add a new § 17.99 to read as follows:

§ 17.99 Critical habitat; plants on the islands of Kauai and Niihau, HI.

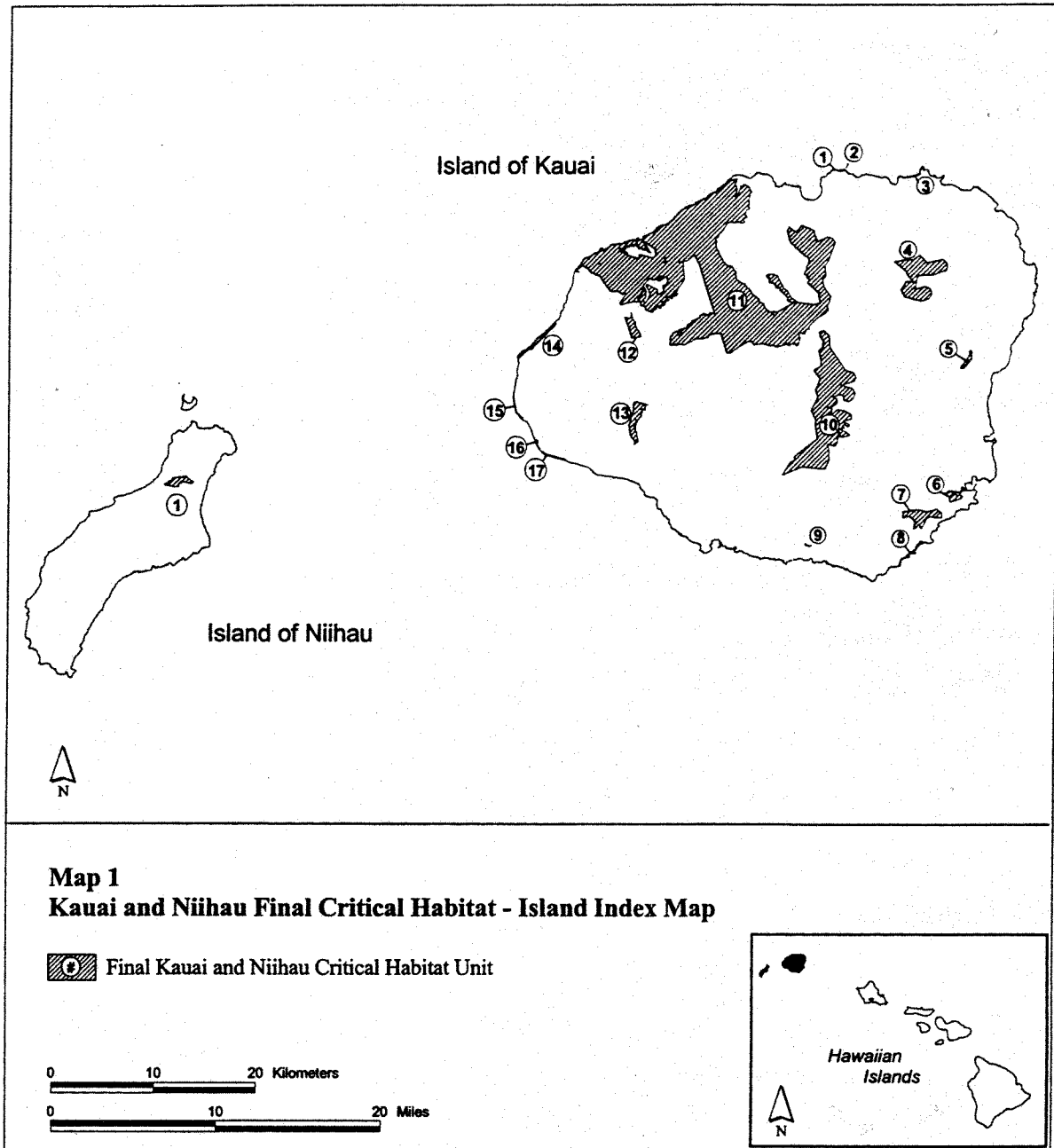
(a) *Maps and critical habitat unit descriptions.* The following paragraphs contain the legal descriptions of the critical habitat units designated for the Hawaiian Islands of Kauai and Niihau. Existing manmade features and structures within the boundaries of the mapped areas, such as buildings; roads; 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 equipment towers and associated structures and equipment; electrical power transmission lines and distribution, and communication facilities and regularly maintained associated rights-of-way and access ways; radars, 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 described for each species in paragraph (b) of this section and therefore are not included in the critical habitat designations.

(1) *Kauai.* 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 219 critical habitat units designated on the island of Kauai.

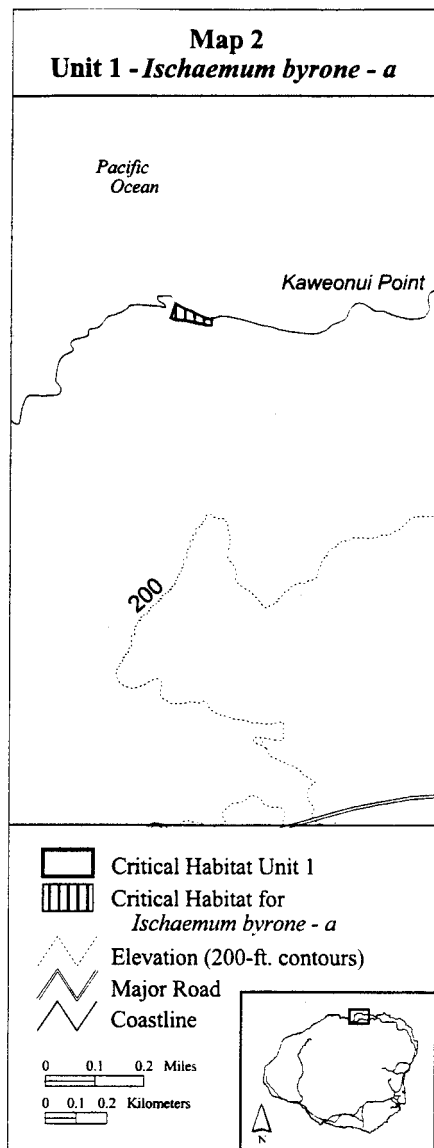
(i) **Note:** Map 1—Index map follows:



(ii) Kauai 1—*Ischaemum byrone*—a (1 ha; .4 ac)

(A) Unit consists of the following 9 boundary points: coastline; 449995, 2458285; 449999, 2458293; 450118, 2458243; 450116, 2458221; 450104, 2458221; 450032, 2458238; 449997, 2458240; 449981, 2458248; 449991, 2458273; coastline.

(B) Note: Map 2 follows:

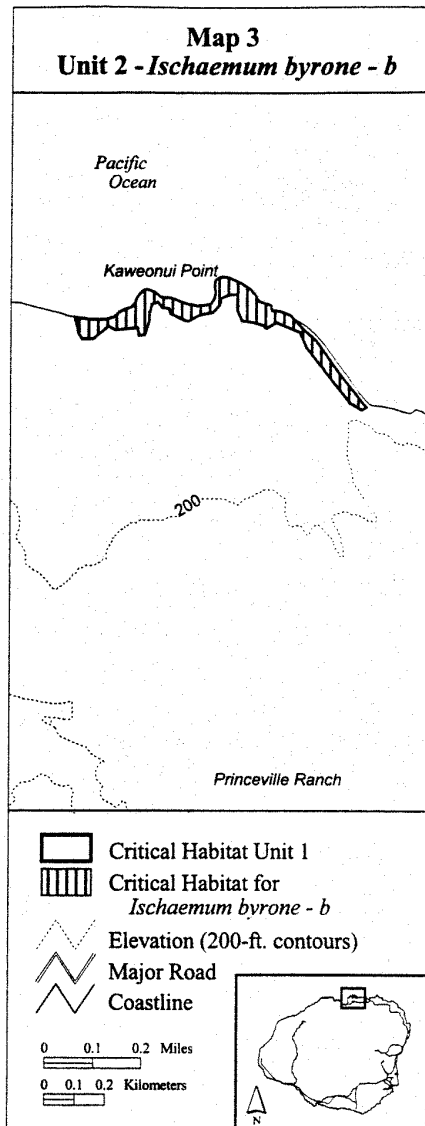


(iii) Kauai 2—*Ischaemum byrone*—b (6 ha; 14 ac)

(A) Unit consists of the following 59 boundary points: coastline; 451087, 2458201; 451120, 2458166; 451162, 2458127; 451246, 2458013; 451331, 2457904; 451317, 2457895; 451278, 2457919; 451277, 2457919; 451276, 2457920; 451190, 2458029; 451190, 2458032; 451175, 2458047; 451132, 2458101; 451110, 2458153; 451031, 2458185; 450999, 2458165; 450996, 2458166; 450987, 2458176; 450954,

2458185; 450916, 2458191; 450905, 2458216; 450900, 2458226; 450901, 2458242; 450902, 2458273; 450902, 2458273; 450902, 2458278; 450871, 2458277; 450848, 2458265; 450843, 2458242; 450818, 2458217; 450778, 2458211; 450737, 2458190; 450725, 2458194; 450679, 2458215; 450677, 2458215; 450673, 2458233; 450650, 2458236; 450636, 2458255; 450615, 2458247; 450612, 2458223; 450607, 2458222; 450607, 2458191; 450606, 2458185; 450592, 2458144; 450574, 2458143; 450568, 2458168; 450568, 2458168; 450568, 450495, 2458159; 450472, 2458173; 450420, 2458129; 450420, 2458129; 450383, 2458129; 450372, 2458147; 450366, 2458173; 450361, 2458197; 450360, 2458202; 450361, 2458202; 451076, 2458209; coastline.

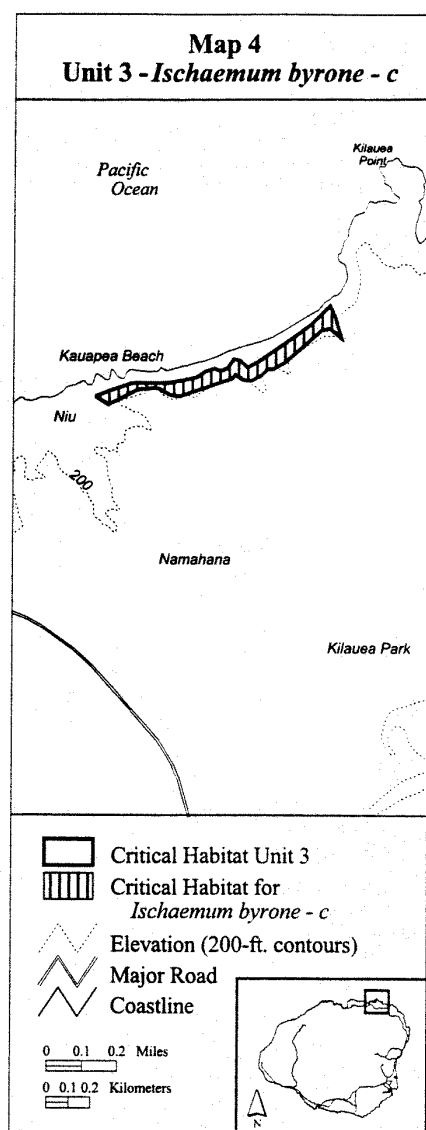
(B) Note: Map 3 follows:



(iv) Kauai 3—*Ischaemum byrone*—c (7 ha; 17 ac)

(A) Unit consists of the following 51 boundary points: Start at 457168, 2457531; 457235, 2457554; 457342, 2457591; 457377, 2457591; 457421, 2457591; 457469, 2457591; 457503, 2457591; 457556, 2457600; 457625, 2457613; 457631, 2457617; 457674, 2457645; 457713, 2457657; 457739, 2457648; 457747, 2457650; 457754, 2457649; 457758, 2457653; 457769, 2457656; 457794, 2457692; 457801, 2457700; 457830, 2457691; 457865, 2457661; 457891, 2457678; 457913, 2457687; 457961, 2457722; 458074, 2457800; 458157, 2457861; 458240, 2457943; 458266, 2457887; 458291, 2457796; 458241, 2457839; 458199, 2457830; 458122, 2457761; 458032, 2457682; 457981, 2457654; 457958, 2457654; 457926, 2457624; 457883, 2457600; 457851, 2457604; 457835, 2457612; 457808, 2457629; 457794, 2457610; 457555, 2457530; 457515, 2457534; 457459, 2457567; 457441, 2457569; 457364, 2457561; 457364, 2457561; 457364, 2457561; 457329, 2457544; 457327, 2457542; 457230, 2457492; return to starting point.

(B) Note: Map 4 follows:



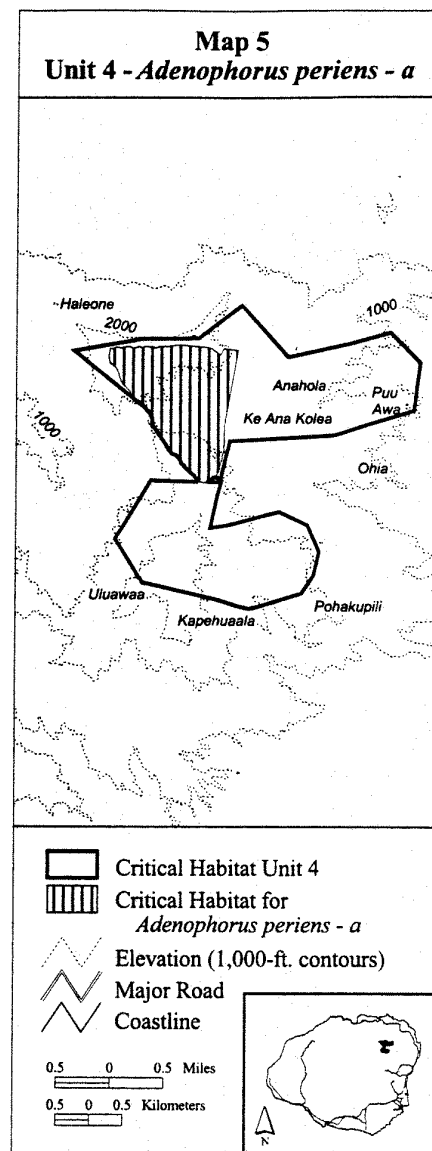
(v) Kauai 4—*Adenophorus periens*—a (237 ha; 585 ac)

(A) Unit consists of the following 183 boundary points: Start at 457883, 2449413; 457917, 2449393; 457954, 2449369; 458004, 2449331; 458025, 2449313; 458037, 2449307; 458058, 2449301; 458098, 2449392; 458308, 2449371; 458105, 2448250; 458095, 2447849; 458085, 2447839; 458077, 2447822; 458073, 2447793; 458073, 2447739; 458057, 2447694; 458046, 2447671; 458033, 2447617; 458027, 2447575; 458026, 2447556; 458023, 2447548; 458009, 2447525; 457998, 2447517; 457979, 2447491; 457946, 2447469; 457927, 2447446; 457899, 2447424; 457864, 2447408; 457850, 2447402; 457830, 2447399; 457801, 2447389; 457689, 2447425; 457690, 2447445; 457684, 2447466; 457667, 2447490; 457653, 2447503; 457639, 2447513; 457604, 2447540; 457587, 2447559; 457545, 2447595; 457538, 2447604; 457528, 2447615; 457505,

2447643; 457502, 2447650; 457473, 2447678; 457457, 2447706; 457446, 2447731; 457399, 2447802; 457389, 2447810; 457328, 2447832; 457310, 2447844; 457297, 2447860; 457274, 2447898; 457234, 2447967; 457193, 2448027; 457148, 2448093; 457124, 2448122; 457112, 2448143; 457089, 2448187; 457076, 2448209; 457048, 2448243; 457032, 2448261; 457029, 2448269; 457028, 2448278; 457031, 2448299; 457032, 2448323; 457031, 2448342; 457028, 2448361; 457016, 2448395; 457005, 2448416; 457002, 2448438; 456998, 2448448; 456991, 2448459; 456973, 2448474; 456957, 2448488; 456943, 2448512; 456930, 2448544; 456916, 2448568; 456896, 2448595; 456883, 2448609; 456870, 2448619; 456856, 2448627; 456832, 2448632; 456801, 2448644; 456771, 2448662; 456748, 2448682; 456733, 2448698; 456713, 2448726; 456697, 2448759; 456679, 2448787; 456671, 2448799; 456652, 2448821; 456635, 2448836; 456615, 2448849; 456596, 2448859; 456583, 2448874; 456572, 2448891; 456563, 2448911; 456551, 2448951; 456541, 2448985; 456535, 2449004; 456530, 2449029; 456526, 2449045; 456516, 2449067; 456504, 2449086; 456491, 2449106; 456476, 2449128; 456462, 2449139; 456446, 2449150; 456435, 2449153; 456419, 2449170; 456404, 2449186; 456395, 2449205; 456387, 2449236; 456386, 2449264; 456390, 2449313; 456395, 2449355; 456394, 2449367; 456394, 2449381; 456397, 2449394; 456401, 2449399; 456407, 2449399; 456420, 2449397; 456439, 2449398; 456457, 2449404; 456483, 2449414; 456501, 2449416; 456513, 2449416; 456533, 2449412; 456569, 2449406; 456586, 2449405; 456603, 2449410; 456620, 2449418; 456633, 2449423; 456647, 2449426; 456662, 2449428; 456681, 2449425; 456706, 2449417; 456733, 2449409; 456752, 2449403; 456769, 2449404; 456787, 2449409; 456807, 2449421; 456818, 2449430; 456826, 2449432; 456836, 2449428; 456852, 2449419; 456862, 2449411; 456869, 2449407; 456878, 2449407; 456889, 2449412; 456910, 2449422; 456924, 2449429; 456941, 2449429; 456969, 2449426; 456991, 2449421; 457000, 2449421; 457034, 2449425; 457042, 2449425; 457049, 2449422; 457064, 2449414; 457073, 2449409; 457083, 2449408; 457097, 2449407; 457107, 2449413; 457123, 2449423; 457132, 2449429; 457141, 2449431; 457168, 2449428; 457205, 2449431; 457229, 2449432; 457255, 2449429; 457276, 2449429; 457289, 2449431; 457300, 2449437; 457307, 2449440; 457314, 2449440; 457325, 2449437; 457352,

2449440; 457363, 2449443; 457395, 2449451; 457417, 2449451; 457451, 2449456; return to starting point.

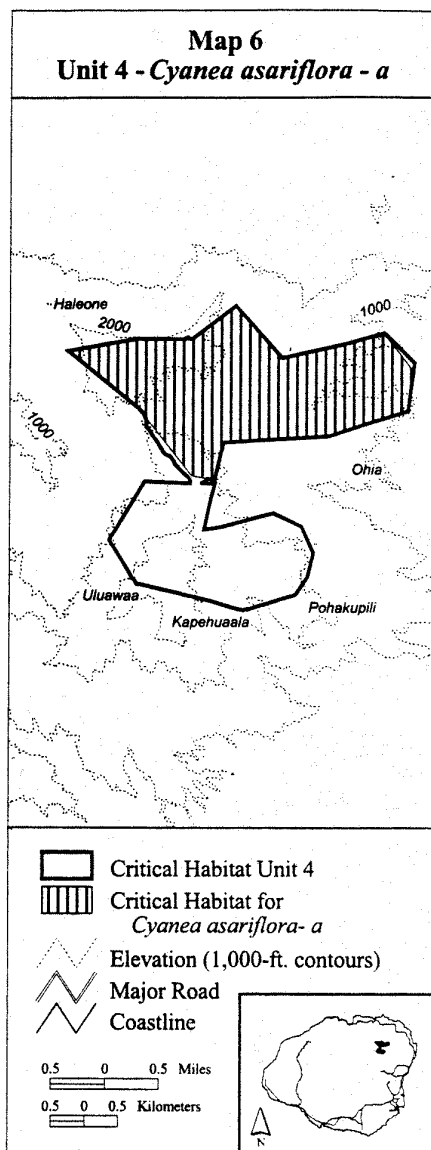
(B) Note: Map 5 follows:



(vi) Kauai 4—*Cyanea asarifolia*—a (654 ha; 1,616 ac)

(A) Unit consists of the following 18 boundary points: Start at 455868, 2449362; 456901, 2449549; 457715, 2449548; 458372, 2450048; 459061, 2449266; 460595, 2449609; 460596, 2449609; 461002, 2449077; 460947, 2448554; 460939, 2448483; 460904, 2448472; 460823, 2448447; 460270, 2448273; 459750, 2448109; 458184, 2448016; 458059, 2447453; 457715, 2447516; 456932, 2448517; return to starting point.

(B) Note: Map 6 follows:



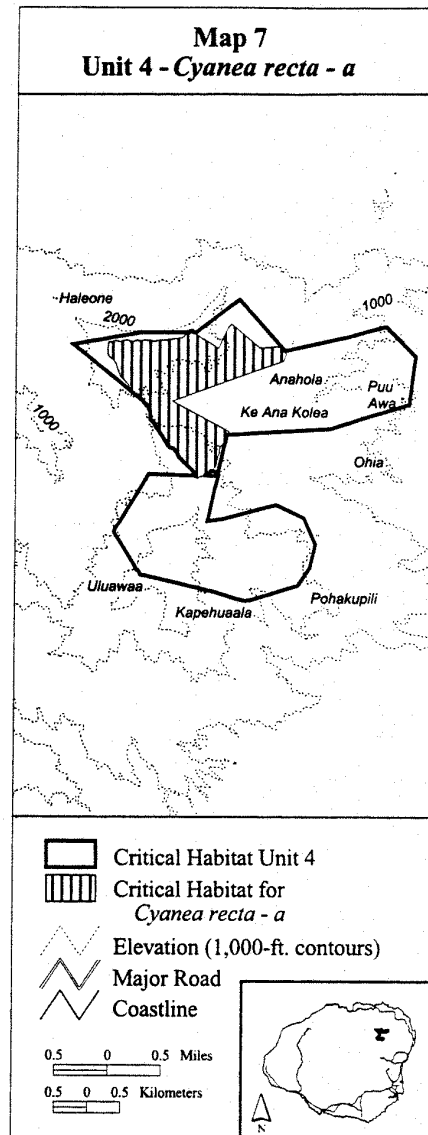
(vii) Kauai 4—*Cyanea recta*—a (252 ha; 622 ac)

(A) Unit consists of the following 217 boundary points: Start at 458254, 2449672; 458681, 2449311; 458976, 2449337; 459083, 2449224; 459041, 2449114; 458385, 2448885; 457368, 2448525; 458223, 2448067; 458204, 2448065; 458165, 2447893; 458096, 2447851; 458085, 2447839; 458077, 2447822; 458073, 2447793; 458073, 2447739; 458057, 2447694; 458046, 2447671; 458033, 2447617; 458027, 2447575; 458026, 2447556; 458023, 2447548; 458009, 2447525; 457998, 2447517; 457979, 2447491; 457946, 2447469; 457927, 2447446; 457899, 2447424; 457864, 2447408; 457850, 2447402; 457830, 2447399; 457797, 2447387; 457757, 2447362; 457741, 2447354; 457739, 2447359; 457725, 2447369; 457716, 2447375; 457694, 2447401; 457689, 2447425; 457690, 2447445; 457684, 2447466; 457667,

2447490; 457653, 2447503; 457639, 2447513; 457604, 2447540; 457587, 2447559; 457545, 2447595; 457538, 2447604; 457528, 2447615; 457505, 2447643; 457502, 2447650; 457473, 2447678; 457457, 2447706; 457446, 2447731; 457399, 2447802; 457389, 2447810; 457328, 2447832; 457310, 2447844; 457297, 2447860; 457274, 2447898; 457234, 2447967; 457193, 2448027; 457148, 2448093; 457124, 2448122; 457112, 2448143; 457089, 2448187; 457076, 2448209; 457048, 2448243; 457032, 2448261; 457029, 2448269; 457028, 2448278; 457031, 2448299; 457032, 2448323; 457031, 2448342; 457028, 2448361; 457016, 2448395; 457005, 2448416; 457002, 2448438; 456998, 2448448; 456991, 2448459; 456973, 2448474; 456957, 2448488; 456943, 2448512; 456930, 2448544; 456916, 2448568; 456896, 2448595; 456883, 2448609; 456870, 2448619; 456856, 2448627; 456832, 2448632; 456801, 2448644; 456771, 2448662; 456748, 2448682; 456733, 2448698; 456713, 2448726; 456697, 2448759; 456679, 2448787; 456671, 2448799; 456652, 2448821; 456635, 2448836; 456615, 2448849; 456596, 2448859; 456583, 2448874; 456572, 2448891; 456563, 2448911; 456551, 2448951; 456541, 2448985; 456535, 2449004; 456530, 2449029; 456526, 2449045; 456516, 2449067; 456504, 2449086; 456491, 2449106; 456476, 2449128; 456462, 2449139; 456446, 2449150; 456435, 2449153; 456419, 2449170; 456404, 2449186; 456395, 2449205; 456387, 2449236; 456386, 2449264; 456390, 2449313; 456395, 2449355; 456394, 2449367; 456394, 2449381; 456397, 2449394; 456401, 2449399; 456407, 2449399; 456420, 2449397; 456439, 2449398; 456457, 2449404; 456483, 2449414; 456501, 2449416; 456513, 2449416; 456533, 2449412; 456569, 2449406; 456586, 2449405; 456603, 2449410; 456620, 2449418; 456633, 2449423; 456647, 2449426; 456662, 2449428; 456681, 2449425; 456706, 2449417; 456733, 2449409; 456752, 2449403; 456769, 2449404; 456787, 2449409; 456807, 2449421; 456818, 2449430; 456826, 2449432; 456836, 2449428; 456852, 2449419; 456862, 2449411; 456869, 2449407; 456878, 2449407; 456889, 2449412; 456910, 2449422; 456924, 2449429; 456941, 2449429; 456969, 2449426; 456991, 2449421; 457000, 2449421; 457034, 2449425; 457042, 2449425; 457049, 2449422; 457064, 2449414; 457073, 2449409; 457083, 2449408; 457097, 2449407; 457107, 2449413; 457123, 2449423; 457132, 2449429; 457141, 2449431; 457168, 2449428; 457205, 2449431; 457229,

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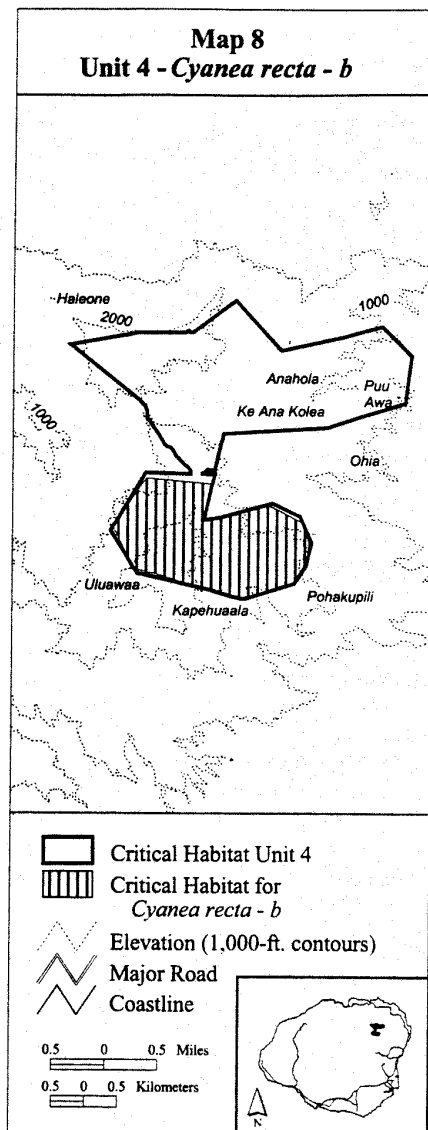
(B) Note: Map 7 follows:



(viii) Kauai 4—*Cyanea recta*—b (351 ha; 868 ac)

(A) Unit consists of the following 15 boundary points: Start at 458861, 2446942; 459372, 2446687; 459490, 2446382; 459454, 2446075; 459242, 2445757; 458486, 2445521; 457390, 2445835; 457139, 2445925; 457088, 2445921; 456838, 2445992; 456525, 2446628; 457027, 2447344; 458020, 2447254; 457900, 2446720; 458214, 2446760; return to starting point.

(B) Note: Map 8 follows:

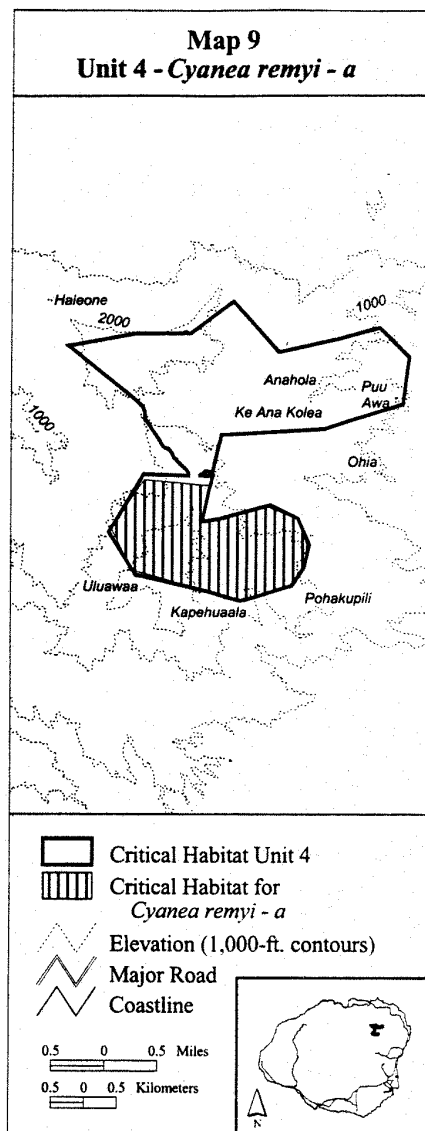


(ix) Kauai 4—*Cyanea remyi*—a (353 ha; 873 ac)

(A) Unit consists of the following 14 boundary points: Start at 457088, 2445921; 456838, 2445992; 456525, 2446628; 457027, 2447344; 458020, 2447254; 457900, 2446720; 458214, 2446760; 458887, 2446950; 459348, 2446748; 459490, 2446382; 459454, 2446075; 459242, 2445757; 458486,

2445521; 457390, 2445835; return to starting point.

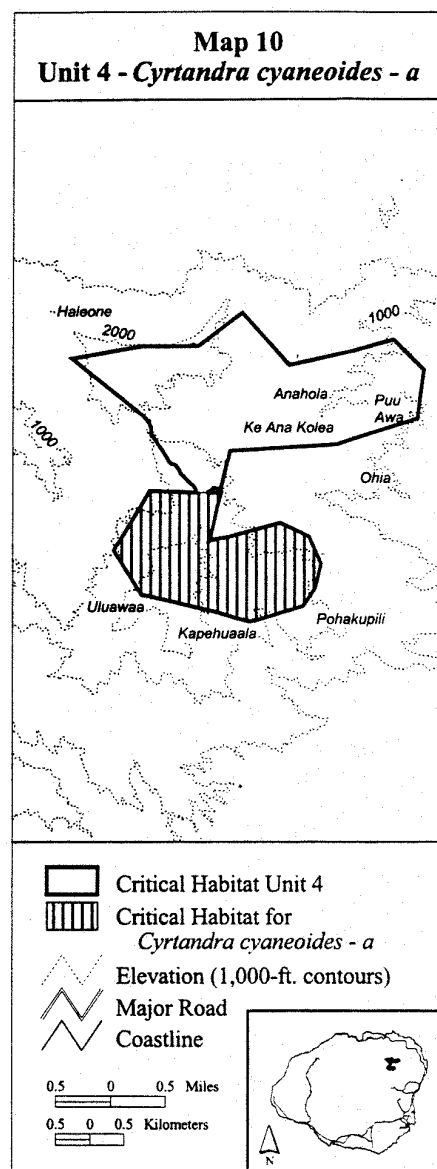
(B) Note: Map 9 follows:



(x) Kauai 4—*Cyrtandra cyaneoides*—a (376 ha; 928 ac)

(A) Unit consists of the following 13 boundary points: Start at 457013, 2447427; 458066, 2447394; 457852, 2446671; 458938, 2446966; 459350, 2446768; 459531, 2446374; 459449, 2446012; 459268, 2445749; 458544, 2445536; 457395, 2445800; 456955, 2445902; 456898, 2445915; 456486, 2446556; return to starting point.

(B) Note: Map 10 follows:



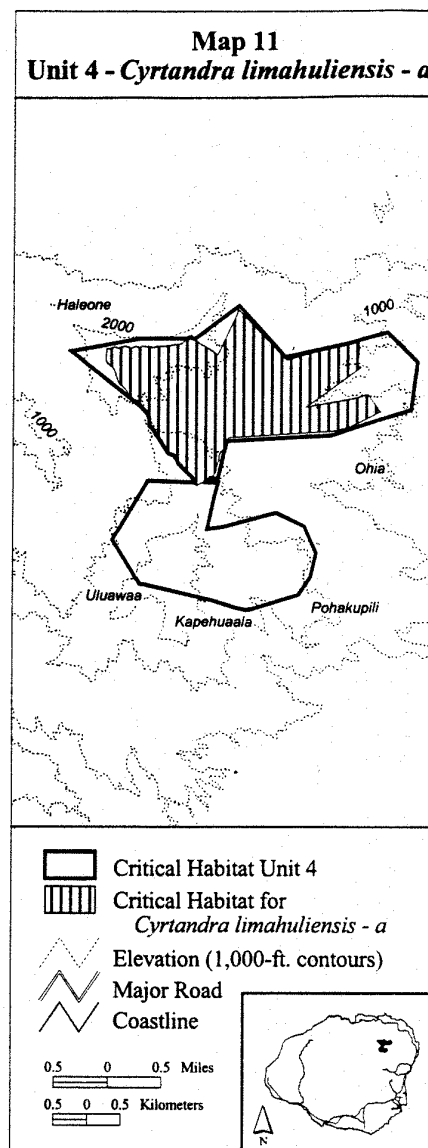
(xi) Kauai 4—*Cyrtandra limahuliensis*—a (501 ha; 1,237 ac)

(A) Unit consists of the following 225 boundary points: Start at 460167, 2449523; 460165, 2449520; 460143, 2449148; 460121, 2449133; 460190, 2449113; 459376, 2448529; 460097, 2448660; 460288, 2448720; 460453, 2448490; 460443, 2448485; 460474, 2448455; 460038, 2448238; 459811, 2448172; 458204, 2448065; 458165, 2447893; 458096, 2447851; 458085, 2447839; 458077, 2447822; 458073, 2447793; 458073, 2447739; 458057, 2447694; 458046, 2447671; 458033, 2447617; 458027, 2447575; 458026, 2447556; 458023, 2447548; 458009, 2447525; 457998, 2447517; 457979, 2447491; 457946, 2447469; 457927, 2447446; 457899, 2447424; 457864, 2447408; 457850, 2447402; 457830, 2447399; 457797, 2447387; 457757, 2447362; 457741, 2447354; 457739,

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 2447860; 457274, 2447898; 457234,
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 2449224; return to starting point.

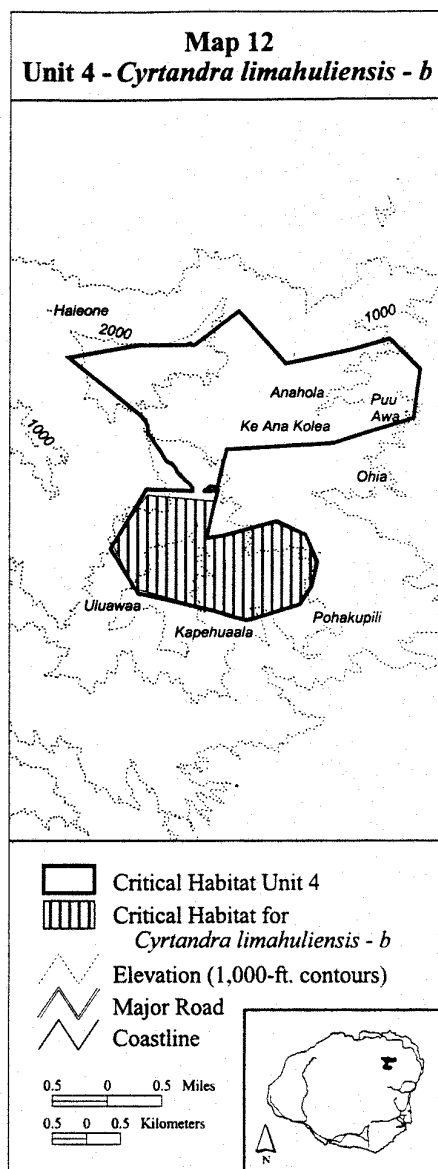
(B) Note: Map 11 follows:



(xii) Kauai 4—*Cyrtandra limahuliensis*—b (353 ha; 873 ac)

(A) Unit consists of the following 14 boundary points: Start at 457088, 2445921; 456838, 2445992; 456525, 2446628; 457027, 2447344; 458020, 2447254; 457900, 2446720; 458214, 2446760; 458887, 2446950; 459348, 2446748; 459490, 2446382; 459454, 2446075; 459242, 2445757; 458486, 2445521; 457390, 2445835; return to starting point.

(B) Note: Map 12 follows:

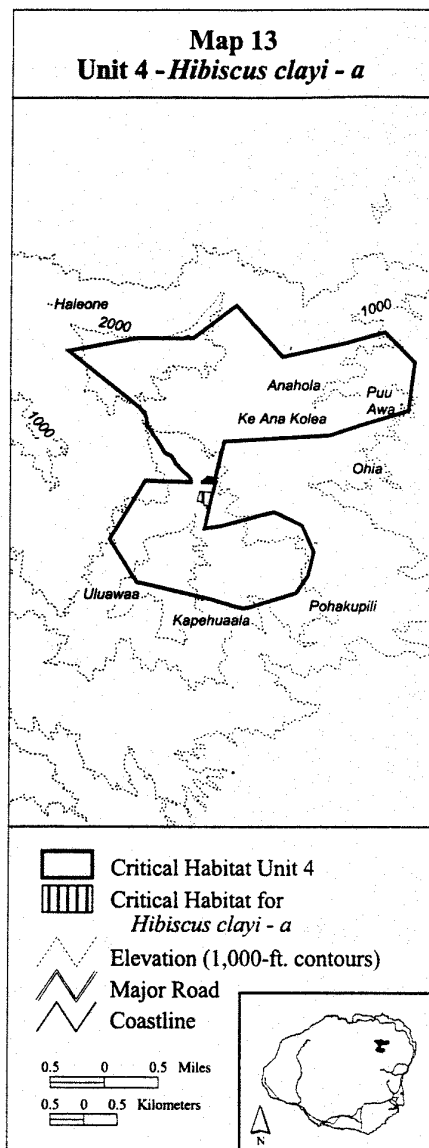


(xiii) Kauai 4—*Hibiscus clayi*—a (4 ha; 9 ac)

(A) Unit consists of the following 70 boundary points: Start at 457819, 2447272; 458020, 2447254; 457971, 2447038; 457967, 2447019; 457946, 2447009; 457942, 2447010; 457938, 2447011; 457936, 2447012; 457933, 2447015; 457932, 2447018; 457930, 2447025; 457932, 2447041; 457933, 2447055; 457933, 2447059; 457931, 2447065; 457930, 2447067; 457928, 2447067; 457921, 2447067; 457918, 2447067; 457917, 2447066; 457910, 2447062; 457908, 2447062; 457898, 2447060; 457896, 2447062; 457894, 2447065; 457893, 2447069; 457890, 2447077; 457888, 2447085; 457888, 2447086; 457887, 2447093; 457887, 2447095; 457884, 2447100; 457878, 2447105; 457871, 2447102; 457868, 2447102; 457858, 2447103; 457848, 2447108; 457844, 2447111; 457841,

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(B) Note: Map 13 follows:



(xiv) Kauai 4—*Hibiscus clayi*—b (85 ha; 210 ac)

(A) Unit consists of the following 421 boundary points: Start at 458269, 2446775; 458887, 2446950; 459348,

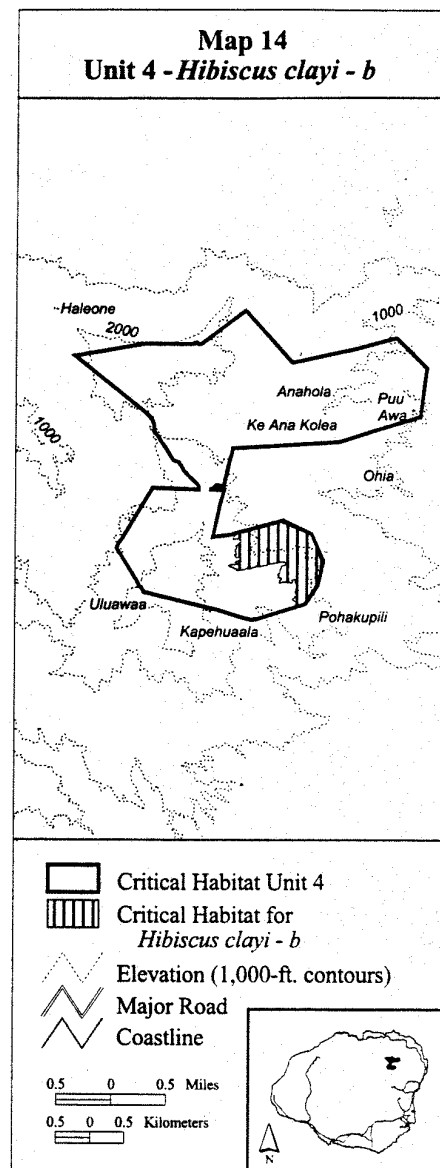
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2446411; 458315, 2446415; 458312,
2446419; 458308, 2446421; 458288,
2446427; 458278, 2446427; 458276,
2446427; 458269, 2446426; 458258,
2446425; 458258, 2446425; 458252,
2446429; 458248, 2446431; 458246,
2446433; 458244, 2446435; 458242,
2446439; 458239, 2446446; 458238,
2446447; 458235, 2446451; 458229,
2446455; 458226, 2446463; 458225,
2446465; 458228, 2446466; 458236,
2446468; 458243, 2446469; 458244,
2446469; 458248, 2446471; 458250,
2446473; 458250, 2446475; 458249,
2446486; 458246, 2446495; 458241,
2446505; 458240, 2446507; 458236,
2446513; 458234, 2446515; 458231,
2446525; 458233, 2446530; 458235,
2446535; 458238, 2446539; 458242,
2446541; 458245, 2446545; 458251,
2446553; 458252, 2446555; 458254,
2446559; 458257, 2446565; 458253,
2446575; 458250, 2446577; 458240,
2446585; 458243, 2446590; 458249,
2446595; 458255, 2446598; 458262,
2446602; 458268, 2446605; 458279,
2446615; 458288, 2446625; 458293,
2446630; 458298, 2446634; 458304,
2446639; 458311, 2446645; 458320,
2446655; 458321, 2446665; 458315,
2446672; 458312, 2446675; 458308,
2446677; 458302, 2446679; 458288,
2446682; 458286, 2446683; 458284,
2446685; 458282, 2446688; 458278,
2446693; 458277, 2446694; 458275,
2446695; 458268, 2446698; 458258,
2446697; 458248, 2446693; 458242,
2446691; 458238, 2446690; 458228,
2446690; 458224, 2446689; 458218,
2446687; 458212, 2446685; 458208,
2446684; 458207, 2446684; 458203,

2446685; 458200, 2446687; 458200,
2446688; 458201, 2446695; 458206,
2446707; 458208, 2446710; 458214,
2446719; 458228, 2446739; 458230,
2446741; 458247, 2446757; 458258,
2446772; return to starting point.

(B) Note: Map 14 follows:



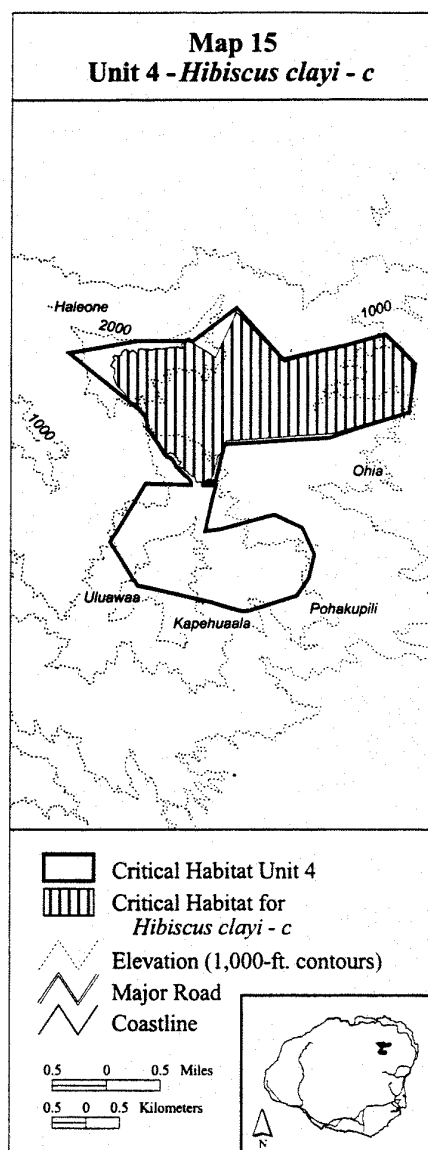
(xv) Kauai 4—*Hibiscus clayi*—c (590 ha; 1,458 ac)

(A) Unit consists of the following 192 boundary points: Start at 457668, 2449552; 457672, 2449547; 457689, 2449529; 457699, 2449522; 457714, 2449515; 457742, 2449506; 457770, 2449483; 457776, 2449475; 457788, 2449467; 457825, 2449449; 457846, 2449433; 457856, 2449429; 457917, 2449393; 457954, 2449369; 458004, 2449331; 458025, 2449313; 458037, 2449307; 458058, 2449301; 458141, 2449491; 458199, 2449615; 458316, 2449881; 458363, 2449984; 459083,

2449224; 460578, 2449637; 461026,
2449189; 460925, 2448495; 459811,
2448172; 458204, 2448065; 458165,
2447893; 458096, 2447851; 458085,
2447839; 458077, 2447822; 458073,
2447793; 458073, 2447739; 458057,
2447694; 458046, 2447671; 458033,
2447617; 458027, 2447575; 458026,
2447556; 458023, 2447548; 458009,
2447525; 457998, 2447517; 457979,
2447491; 457946, 2447469; 457927,
2447446; 457899, 2447424; 457864,
2447422; 457848, 2447449; 457822,
2447451; 457802, 2447444; 457771,
2447453; 457756, 2447462; 457757,
2447484; 457751, 2447506; 457752,
2447524; 457741, 2447534; 457689,
2447539; 457676, 2447562; 457651,
2447573; 457640, 2447603; 457586,
2447621; 457575, 2447659; 457553,
2447656; 457529, 2447667; 457502,
2447707; 457532, 2447722; 457544,
2447753; 457500, 2447771; 457492,
2447810; 457459, 2447812; 457439,
2447864; 457412, 2447879; 457371,
2447884; 457345, 2447859; 457332,
2447868; 457274, 2447898; 457234,
2447967; 457193, 2448027; 457148,
2448093; 457124, 2448122; 457112,
2448143; 457089, 2448187; 457076,
2448209; 457048, 2448243; 457032,
2448261; 457029, 2448269; 457028,
2448278; 457031, 2448299; 457032,
2448323; 457031, 2448342; 457028,
2448361; 457016, 2448395; 457005,
2448416; 457002, 2448438; 456998,
2448448; 456991, 2448459; 456973,
2448474; 456957, 2448488; 456943,
2448512; 456930, 2448544; 456916,
2448568; 456896, 2448595; 456883,
2448609; 456870, 2448619; 456856,
2448627; 456832, 2448632; 456801,
2448644; 456771, 2448662; 456748,
2448682; 456733, 2448698; 456713,
2448726; 456697, 2448759; 456679,
2448787; 456671, 2448799; 456652,
2448821; 456635, 2448836; 456615,
2448849; 456596, 2448859; 456583,
2448874; 456572, 2448891; 456563,
2448911; 456551, 2448951; 456541,
2448985; 456535, 2449004; 456530,
2449029; 456546, 2449060; 456540,
2449095; 456553, 2449134; 456490,
2449179; 456513, 2449208; 456520,
2449240; 456555, 2449262; 456524,
2449303; 456546, 2449327; 456600,
2449316; 456652, 2449333; 456652,
2449376; 456672, 2449396; 456706,
2449417; 456733, 2449409; 456778,
2449374; 456817, 2449409; 456862,
2449378; 456880, 2449352; 456895,
2449372; 456897, 2449409; 456924,
2449429; 456941, 2449429; 456969,
2449426; 456991, 2449421; 457000,
2449421; 457034, 2449425; 457042,
2449425; 457049, 2449422; 457064,
2449414; 457073, 2449409; 457083,
2449408; 457097, 2449407; 457107,

2449413; 457123, 2449423; 457132,
2449429; 457141, 2449431; 457168,
2449428; 457205, 2449431; 457229,
2449432; 457255, 2449429; 457276,
2449429; 457289, 2449431; 457300,
2449437; 457307, 2449440; 457314,
2449440; 457325, 2449437; 457352,
2449440; 457363, 2449443; 457395,
2449451; 457417, 2449451; 457492,
2449461; 457518, 2449446; 457527,
2449437; 457542, 2449435; 457550,
2449428; 457557, 2449434; 457555,
2449453; 457546, 2449470; 457543,
2449490; 457547, 2449505; 457592,
2449538; 457610, 2449548; 457619,
2449546; 457638, 2449550; 457649,
2449548; 457660, 2449547; return to
starting point.

(B) Note: Map 15 follows:



(xvi) Kauai 4—*Hibiscus clayi*—d (48 ha; 119 ac)

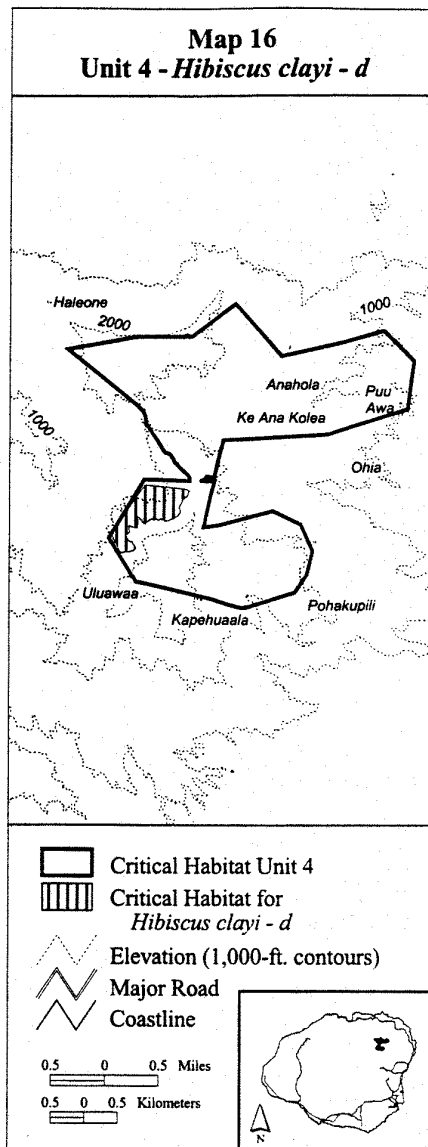
(A) Unit consists of the following 283 boundary points: Start at 457027,

2447344; 457644, 2447288; 457645,
2447282; 457658, 2447272; 457670,
2447265; 457675, 2447261; 457678,
2447259; 457680, 2447257; 457682,
2447255; 457680, 2447245; 457678,
2447241; 457676, 2447237; 457674,
2447235; 457669, 2447225; 457666,
2447215; 457663, 2447205; 457662,
2447195; 457661, 2447192; 457657,
2447185; 457651, 2447175; 457650,
2447173; 457648, 2447172; 457644,
2447169; 457638, 2447166; 457637,
2447166; 457631, 2447162; 457628,
2447160; 457625, 2447158; 457621,
2447152; 457618, 2447148; 457608,
2447139; 457605, 2447138; 457602,
2447135; 457600, 2447133; 457595,
2447128; 457591, 2447122; 457586,
2447115; 457584, 2447109; 457584,
2447105; 457582, 2447095; 457577,
2447086; 457576, 2447085; 457573,
2447075; 457571, 2447072; 457568,
2447068; 457564, 2447065; 457561,
2447062; 457556, 2447057; 457555,
2447055; 457552, 2447051; 457541,
2447032; 457537, 2447025; 457536,
2447017; 457536, 2447015; 457536,
2447012; 457537, 2447005; 457541,
2446995; 457545, 2446985; 457546,
2446983; 457557, 2446955; 457560,
2446945; 457558, 2446941; 457556,
2446937; 457551, 2446932; 457545,
2446928; 457540, 2446924; 457535,
2446919; 457531, 2446913; 457527,
2446906; 457524, 2446899; 457523,
2446895; 457522, 2446892; 457518,
2446887; 457517, 2446885; 457512,
2446881; 457508, 2446880; 457504,
2446879; 457497, 2446877; 457489,
2446874; 457483, 2446871; 457478,
2446868; 457471, 2446863; 457465,
2446858; 457458, 2446852; 457452,
2446845; 457448, 2446842; 457438,
2446838; 457428, 2446838; 457418,
2446837; 457408, 2446834; 457403,
2446831; 457398, 2446828; 457391,
2446823; 457385, 2446818; 457381,
2446815; 457379, 2446814; 457378,
2446814; 457371, 2446812; 457358,
2446810; 457354, 2446809; 457347,
2446807; 457344, 2446805; 457338,
2446803; 457336, 2446803; 457328,
2446805; 457327, 2446805; 457322,
2446809; 457319, 2446815; 457318,
2446825; 457308, 2446825; 457302,
2446828; 457298, 2446830; 457268,
2446834; 457258, 2446833; 457248,
2446831; 457244, 2446829; 457236,
2446825; 457228, 2446822; 457225,
2446822; 457218, 2446821; 457216,
2446823; 457213, 2446825; 457211,
2446828; 457208, 2446831; 457206,
2446833; 457200, 2446837; 457198,
2446838; 457191, 2446838; 457188,
2446838; 457168, 2446832; 457158,
2446831; 457155, 2446832; 457148,
2446834; 457138, 2446839; 457128,
2446839; 457118, 2446836; 457108,

2446831; 457088, 2446819; 457078,
2446813; 457068, 2446807; 457057,
2446796; 457044, 2446780; 457041,
2446775; 457038, 2446772; 457035,
2446769; 457028, 2446765; 457018,
2446765; 457013, 2446770; 457008,
2446774; 457007, 2446775; 457003,
2446780; 456994, 2446791; 456990,
2446797; 456982, 2446809; 456978,
2446816; 456968, 2446830; 456958,
2446844; 456950, 2446855; 456940,
2446867; 456938, 2446868; 456928,
2446872; 456918, 2446869; 456916,
2446867; 456914, 2446865; 456912,
2446861; 456911, 2446855; 456912,
2446845; 456914, 2446835; 456917,
2446825; 456919, 2446816; 456921,
2446808; 456924, 2446795; 456923,
2446785; 456920, 2446775; 456920,
2446774; 456920, 2446765; 456921,
2446758; 456921, 2446753; 456921,
2446745; 456920, 2446743; 456917,
2446725; 456916, 2446718; 456915,
2446715; 456912, 2446712; 456908,
2446710; 456898, 2446708; 456888,
2446707; 456882, 2446709; 456878,
2446710; 456868, 2446715; 456858,
2446720; 456854, 2446721; 456839,
2446726; 456823, 2446730; 456808,
2446732; 456800, 2446734; 456789,
2446735; 456788, 2446734; 456786,
2446728; 456785, 2446719; 456785,
2446706; 456786, 2446696; 456788,
2446686; 456791, 2446678; 456793,
2446676; 456794, 2446672; 456797,
2446664; 456798, 2446656; 456797,
2446647; 456797, 2446646; 456793,
2446641; 456777, 2446627; 456775,
2446626; 456771, 2446623; 456765,
2446619; 456758, 2446616; 456748,
2446610; 456746, 2446608; 456743,
2446606; 456736, 2446596; 456742,
2446586; 456748, 2446581; 456751,
2446579; 456753, 2446576; 456756,
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2446546; 456768, 2446536; 456769,
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2446522; 456778, 2446521; 456788,
2446518; 456791, 2446516; 456795,
2446512; 456798, 2446509; 456801,
2446508; 456808, 2446505; 456816,
2446504; 456838, 2446501; 456842,
2446499; 456844, 2446496; 456844,
2446486; 456843, 2446476; 456845,
2446472; 456850, 2446467; 456856,
2446463; 456863, 2446460; 456869,
2446456; 456870, 2446456; 456881,
2446439; 456882, 2446436; 456883,
2446426; 456882, 2446416; 456883,
2446406; 456883, 2446401; 456882,
2446396; 456881, 2446394; 456878,
2446392; 456852, 2446372; 456848,
2446370; 456845, 2446369; 456830,
2446364; 456822, 2446362; 456808,
2446358; 456788, 2446354; 456778,
2446355; 456768, 2446358; 456758,
2446360; 456748, 2446361; 456738,
2446360; 456728, 2446357; 456727,

2446356; 456716, 2446348; 456709,
2446345; 456708, 2446345; 456700,
2446344; 456698, 2446344; 456688,
2446342; 456678, 2446340; 456675,
2446339; 456668, 2446337; 456525,
2446628; return to starting point.

(B) Note: Map 16 follows:



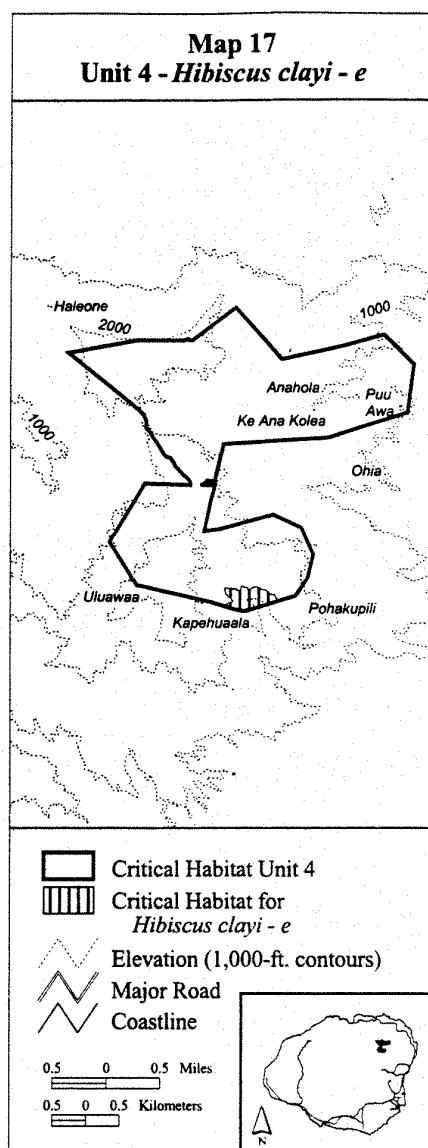
(xvii) Kauai 4—*Hibiscus clayi*—e (19 ha; 47 ac)

(A) Unit consists of the following 225 boundary points: Start at 459000, 2445681; 458500, 2445525; 458499, 2445526; 458498, 2445527; 458493, 2445530; 458488, 2445532; 458485, 2445533; 458478, 2445534; 458469, 2445547; 458468, 2445547; 458463, 2445550; 458458, 2445552; 458448, 2445549; 458440, 2445544; 458428, 2445540; 458422, 2445539; 458288, 2445578; 458285, 2445582; 458281, 2445586; 458273, 2445590; 458268, 2445593; 458266, 2445596; 458263, 2445601; 458259, 2445606; 458254,

2445611; 458248, 2445616; 458248, 2445616; 458244, 2445622; 458244, 2445626; 458248, 2445632; 458258, 2445645; 458259, 2445646; 458265, 2445649; 458268, 2445650; 458278, 2445651; 458283, 2445651; 458291, 2445653; 458306, 2445656; 458323, 2445661; 458328, 2445663; 458332, 2445666; 458333, 2445671; 458334, 2445676; 458328, 2445683; 458326, 2445686; 458318, 2445691; 458316, 2445693; 458312, 2445696; 458311, 2445698; 458307, 2445704; 458288, 2445726; 458283, 2445731; 458274, 2445736; 458271, 2445738; 458268, 2445740; 458265, 2445743; 458263, 2445746; 458261, 2445748; 458257, 2445754; 458255, 2445756; 458251, 2445758; 458248, 2445760; 458244, 2445766; 458242, 2445770; 458234, 2445782; 458230, 2445786; 458229, 2445787; 458228, 2445788; 458226, 2445793; 458225, 2445796; 458224, 2445806; 458222, 2445816; 458217, 2445836; 458212, 2445849; 458207, 2445855; 458207, 2445856; 458207, 2445857; 458211, 2445863; 458215, 2445866; 458217, 2445867; 458228, 2445872; 458232, 2445872; 458235, 2445872; 458245, 2445872; 458248, 2445872; 458253, 2445870; 458261, 2445866; 458266, 2445863; 458268, 2445862; 458278, 2445859; 458292, 2445862; 458302, 2445866; 458307, 2445867; 458311, 2445869; 458318, 2445870; 458327, 2445866; 458328, 2445865; 458332, 2445860; 458336, 2445854; 458338, 2445852; 458348, 2445850; 458351, 2445853; 458356, 2445858; 458358, 2445861; 458368, 2445866; 458375, 2445862; 458378, 2445860; 458388, 2445849; 458392, 2445846; 458398, 2445841; 458408, 2445836; 458418, 2445833; 458428, 2445833; 458431, 2445833; 458439, 2445835; 458446, 2445834; 458448, 2445841; 458450, 2445848; 458452, 2445852; 458454, 2445866; 458455, 2445876; 458457, 2445885; 458457, 2445887; 458458, 2445890; 458462, 2445892; 458468, 2445893; 458478, 2445892; 458482, 2445892; 458486, 2445893; 458488, 2445893; 458495, 2445892; 458498, 2445891; 458516, 2445883; 458523, 2445880; 458528, 2445876; 458536, 2445873; 458538, 2445872; 458548, 2445871; 458551, 2445868; 458552, 2445865; 458555, 2445862; 458558, 2445859; 458565, 2445855; 458567, 2445854; 458568, 2445854; 458578, 2445853; 458588, 2445849; 458598, 2445849; 458603, 2445851; 458608, 2445853; 458610, 2445855; 458618, 2445865; 458623, 2445871; 458625, 2445875; 458628, 2445879; 458632, 2445882; 458638, 2445885; 458647, 2445884; 458658, 2445884; 458663, 2445885; 458667,

2445886; 458688, 2445888; 458691, 2445888; 458698, 2445885; 458704, 2445881; 458708, 2445877; 458709, 2445876; 458718, 2445873; 458724, 2445871; 458728, 2445870; 458731, 2445868; 458735, 2445865; 458738, 2445863; 458743, 2445860; 458751, 2445858; 458758, 2445856; 458759, 2445855; 458768, 2445849; 458771, 2445848; 458778, 2445845; 458788, 2445844; 458798, 2445844; 458808, 2445842; 458818, 2445840; 458821, 2445838; 458825, 2445835; 458826, 2445834; 458828, 2445832; 458833, 2445830; 458840, 2445827; 458843, 2445825; 458858, 2445819; 458861, 2445818; 458864, 2445815; 458866, 2445813; 458870, 2445807; 458874, 2445801; 458878, 2445795; 458884, 2445791; 458891, 2445788; 458898, 2445786; 458900, 2445785; 458908, 2445781; 458915, 2445775; 458918, 2445773; 458928, 2445770; 458938, 2445770; 458948, 2445773; 458955, 2445772; 458958, 2445772; 458962, 2445769; 458963, 2445765; 458963, 2445755; 458964, 2445745; 458967, 2445735; 458971, 2445728; 458973, 2445725; 458975, 2445722; 458980, 2445717; 458983, 2445715; 458985, 2445712; 458988, 2445708; 458989, 2445706; 458992, 2445695; 458997, 2445685; return to starting point.

(B) Note: Map 17 follows:

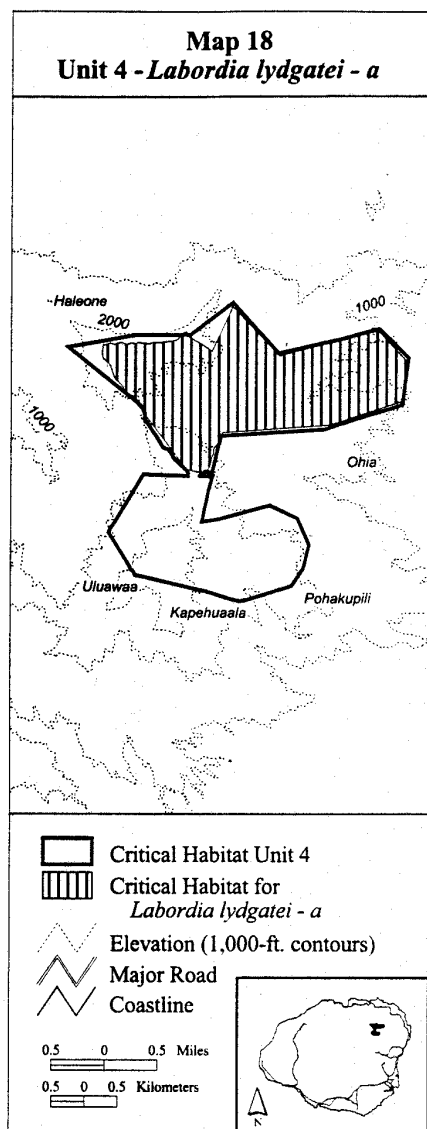


(xviii) Kauai 4—*Labordia lydgatei*—a (588 ha; 1,453 ac)

(A) Unit consists of the following 170 boundary points: Start at 457589, 2449536; 457687, 2449531; 457689, 2449529; 457699, 2449522; 457714, 2449515; 457742, 2449506; 457770, 2449483; 457776, 2449475; 457788, 2449467; 457825, 2449449; 457846, 2449433; 457856, 2449429; 457917, 2449393; 457954, 2449369; 458004, 2449331; 458025, 2449313; 458037, 2449307; 458058, 2449301; 458141, 2449491; 458199, 2449615; 458316, 2449881; 458363, 2449983; 458397, 2449949; 459083, 2449224; 460011, 2449480; 460567, 2449609; 461011, 2449133; 460921, 2448534; 459969, 2448218; 459811, 2448172; 458204, 2448065; 458165, 2447893; 458096, 2447851; 458085, 2447839; 458077, 2447822; 458073, 2447793; 458073, 2447739; 458057, 2447694; 458046, 2447671; 458033, 2447617; 458027,

2447575; 458026, 2447556; 458023, 2447548; 458009, 2447525; 457998, 2447517; 457979, 2447491; 457946, 2447469; 457930, 2447450; 457669, 2447502; 457031, 2448340; 457031, 2448342; 457028, 2448361; 457016, 2448395; 457005, 2448416; 457002, 2448438; 456998, 2448448; 456991, 2448459; 456973, 2448474; 456957, 2448488; 456943, 2448512; 456930, 2448544; 456916, 2448568; 456896, 2448595; 456883, 2448609; 456870, 2448619; 456856, 2448627; 456832, 2448632; 456801, 2448644; 456771, 2448662; 456748, 2448682; 456733, 2448698; 456713, 2448726; 456697, 2448759; 456679, 2448787; 456671, 2448799; 456652, 2448821; 456635, 2448836; 456615, 2448849; 456596, 2448859; 456583, 2448874; 456572, 2448891; 456563, 2448911; 456551, 2448951; 456541, 2448985; 456535, 2449004; 456530, 2449029; 456526, 2449045; 456516, 2449067; 456504, 2449086; 456491, 2449106; 456476, 2449128; 456462, 2449139; 456446, 2449150; 456435, 2449153; 456419, 2449170; 456404, 2449186; 456395, 2449205; 456387, 2449236; 456386, 2449264; 456390, 2449313; 456395, 2449355; 456394, 2449367; 456394, 2449381; 456397, 2449394; 456401, 2449399; 456407, 2449399; 456420, 2449397; 456439, 2449398; 456457, 2449404; 456483, 2449414; 456501, 2449416; 456513, 2449416; 456533, 2449412; 456569, 2449406; 456586, 2449405; 456603, 2449410; 456620, 2449418; 456633, 2449423; 456647, 2449426; 456662, 2449428; 456681, 2449425; 456706, 2449417; 456733, 2449409; 456752, 2449403; 456769, 2449404; 456787, 2449409; 456807, 2449421; 456818, 2449430; 456826, 2449432; 456836, 2449428; 456852, 2449419; 456862, 2449411; 456869, 2449407; 456878, 2449407; 456889, 2449412; 456910, 2449422; 456924, 2449429; 456941, 2449429; 456969, 2449426; 456991, 2449421; 457000, 2449421; 457034, 2449425; 457042, 2449425; 457049, 2449422; 457064, 2449414; 457073, 2449409; 457083, 2449408; 457097, 2449407; 457107, 2449413; 457123, 2449423; 457132, 2449429; 457141, 2449431; 457168, 2449428; 457205, 2449431; 457229, 2449432; 457255, 2449429; 457276, 2449429; 457289, 2449431; 457300, 2449437; 457307, 2449440; 457314, 2449440; 457325, 2449437; 457352, 2449440; 457363, 2449443; 457395, 2449451; 457417, 2449451; 457492, 2449461; 457515, 2449471; 457522, 2449475; 457547, 2449505; return to starting point.

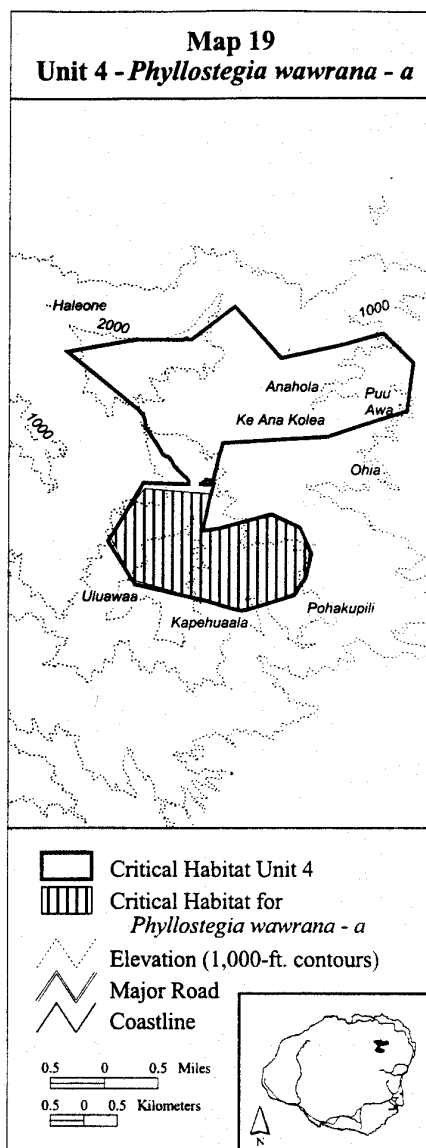
(B) Note: Map 18 follows:



(xix) Kauai 4—*Phyllostegia wawrana*—a (352 ha; 869 ac)

(A) Unit consists of the following 25 boundary points: Start at 457390, 2445835; 457088, 2445921; 456838, 2445992; 456709, 2446255; 456732, 2446269; 456702, 2446268; 456529, 2446620; 456709, 2446891; 457027, 2447344; 458020, 2447262; 457940, 2447000; 457957, 2446974; 457900, 2446720; 458214, 2446760; 458463, 2446830; 458936, 2446928; 459341, 2446751; 459365, 2446704; 459490, 2446382; 459454, 2446075; 459260, 2445784; 458941, 2445663; 458510, 2445529; 458255, 2445590; 458262, 2445585; return to starting point.

(B) Note: Map 19 follows:

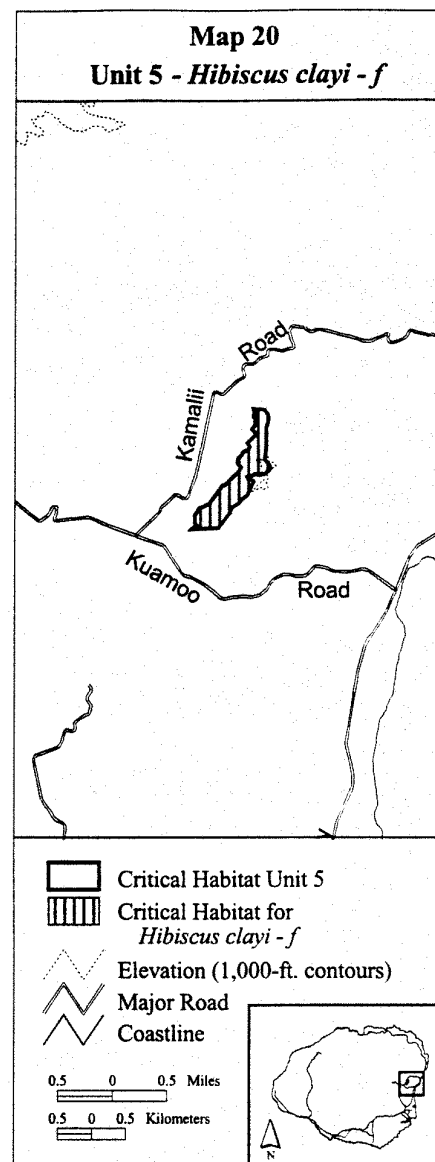


(xx) Kauai 5—*Hibiscus clayi*—f (60 ha; 148 ac)

(A) Unit consists of the following 52 boundary points: Start at 462370, 2438990; 462438, 2439048; 462412, 2439074; 462412, 2439188; 462475, 2439287; 462548, 2439318; 462631, 2439365; 462709, 2439469; 462819, 2439625; 462845, 2439625; 463011, 2439781; 463043, 2439818; 463084, 2439885; 463074, 2439911; 463037, 2439953; 463048, 2440021; 463079, 2440042; 463121, 2440109; 463162, 2440140; 463194, 2440140; 463214, 2440192; 463183, 2440245; 463313, 2440375; 463246, 2440448; 463287, 2440505; 463298, 2440609; 463256, 2440635; 463287, 2440671; 463272, 2440744; 463433, 2440739; 463496, 2440650; 463491, 2440588; 463465, 2440479; 463459, 2440333; 463465, 2440187; 463438, 2440000; 463511, 2439916; 463517, 2439870; 463449, 2439802; 463360, 2439771; 463287,

2439792; 463256, 2439766; 463183, 2439745; 463194, 2439724; 463246, 2439703; 463272, 2439677; 463183, 2439474; 463126, 2439438; 463063, 2439365; 462954, 2439297; 462938, 2439230; 462756, 2439001; return to starting point.

(B) Note: Map 20 follows:

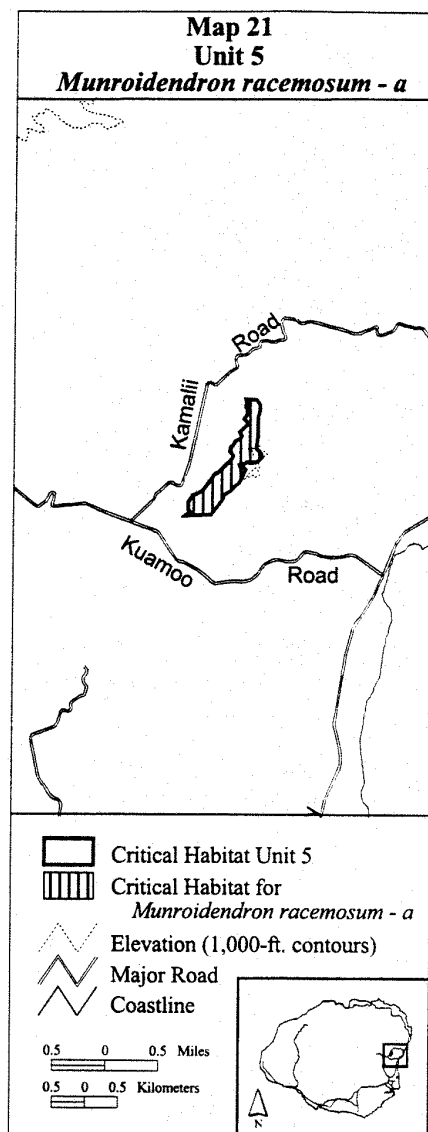


(xxi) Kauai 5—*Munroidendron racemosum*—a (60 ha; 148 ac)

(A) Unit consists of the following 52 boundary points: Start at 462370, 2438990; 462438, 2439048; 462412, 2439074; 462412, 2439188; 462475, 2439287; 462548, 2439318; 462631, 2439365; 462709, 2439469; 462819, 2439625; 462845, 2439625; 463011, 2439781; 463043, 2439818; 463084, 2439885; 463074, 2439911; 463037, 2439953; 463048, 2440021; 463079, 2440042; 463121, 2440109; 463162, 2440140; 463194, 2440140; 463214,

2440192; 463183, 2440245; 463313, 2440375; 463246, 2440448; 463287, 2440505; 463298, 2440609; 463256, 2440635; 463287, 2440671; 463272, 2440744; 463433, 2440739; 463496, 2440650; 463491, 2440588; 463465, 2440479; 463459, 2440333; 463465, 2440187; 463438, 2440000; 463511, 2439916; 463517, 2439870; 463449, 2439802; 463360, 2439771; 463287, 2439792; 463256, 2439766; 463183, 2439745; 463194, 2439724; 463246, 2439703; 463272, 2439677; 463183, 2439474; 463126, 2439438; 463063, 2439365; 462954, 2439297; 462938, 2439230; 462756, 2439001; return to starting point.

(B) Note: Map 21 follows:

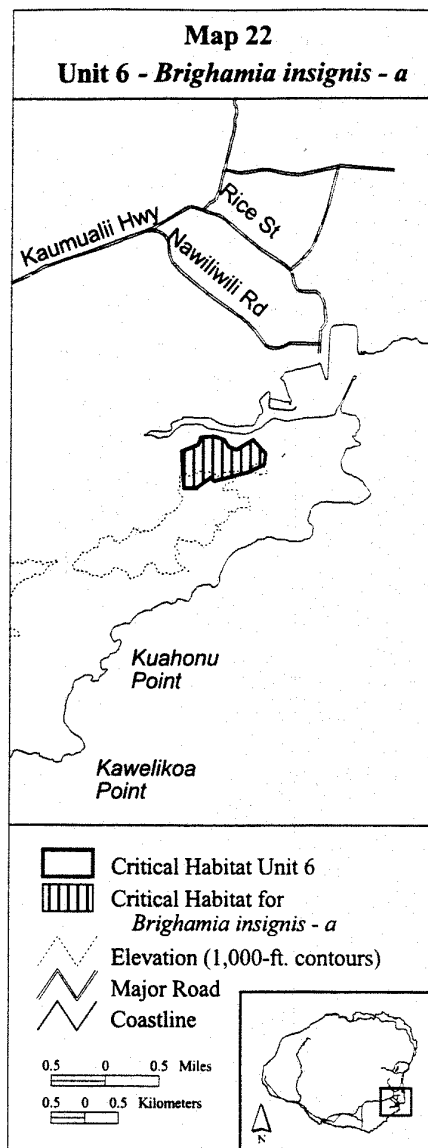


(xxii) Kauai 6—*Brighamia insignis*—a (63 ha; 156 ac)

(A) Unit consists of the following 22 boundary points: Start at 462682, 2426559; 462657, 2426391; 462532, 2426329; 462422, 2426274; 462417,

2426272; 462234, 2426225; 462055, 2426178; 461911, 2426141; 461862, 2426197; 461719, 2426089; 461655, 2426041; 461649, 2426036; 461464, 2426045; 461448, 2426165; 461433, 2426586; 461678, 2426687; 461714, 2426795; 461907, 2426808; 462068, 2426762; 462130, 2426658; 462247, 2426612; 462487, 2426760; return to starting point.

(B) Note: Map 22 follows:

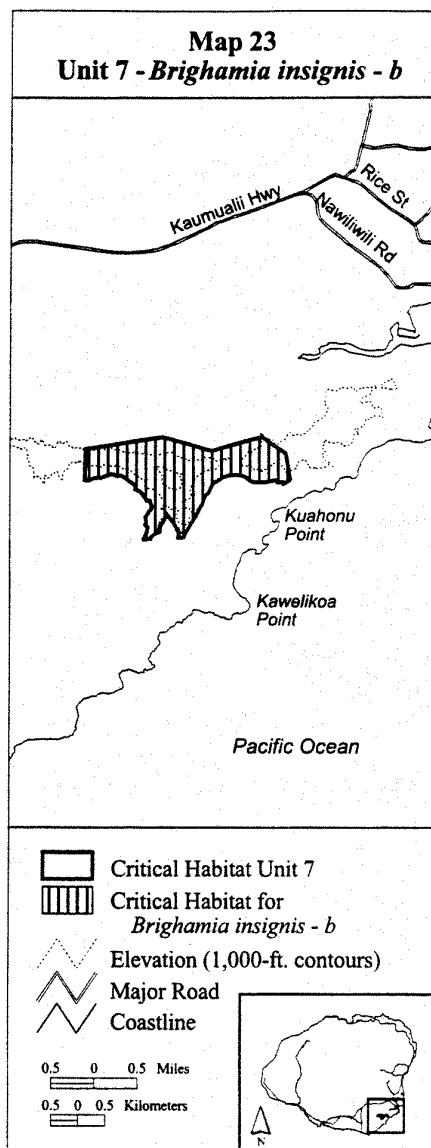


(xxiii) Kauai 7—*Brighamia insignis*—b (341 ha; 842 ac)

(A) Unit consists of the following 118 boundary points: Start at 458142, 2423455; 458117, 2423452; 458106, 2423450; 458074, 2423446; 458031, 2423441; 458022, 2423439; 458014, 2423466; 458021, 2423472; 458036, 2423485; 458058, 2423560; 458086, 2423655; 458073, 2423681; 458043, 2423708; 458049, 2423751; 458049, 2423808; 458039, 2423854; 458066,

2423887; 458092, 2423928; 458096, 2423934; 458119, 2423970; 458122, 2423978; 458149, 2423997; 458162, 2424054; 458136, 2424097; 458136, 2424099; 458133, 2424118; 458126, 2424160; 458066, 2424167; 458043, 2424217; 458009, 2424240; 457966, 2424313; 457930, 2424340; 457853, 2424376; 457860, 2424406; 457833, 2424456; 457640, 2424596; 457594, 2424622; 457527, 2424612; 457504, 2424622; 457474, 2424636; 457421, 2424646; 457371, 2424652; 457358, 2424642; 457321, 2424612; 457298, 2424612; 457252, 2424591; 457238, 2424585; 457218, 2424576; 457204, 2424580; 457203, 2424580; 457195, 2424582; 457148, 2424589; 457099, 2424582; 457036, 2424556; 457019, 2424549; 457006, 2424540; 456924, 2424561; 456949, 2425099; 458411, 2425339; 458609, 2425269; 459268, 2425094; 459490, 2425148; 460208, 2425361; 460651, 2425063; 460662, 2424997; 460736, 2424562; 460732, 2424559; 460721, 2424548; 460705, 2424534; 460688, 2424518; 460619, 2424484; 460594, 2424517; 460594, 2424517; 460495, 2424517; 460475, 2424550; 460373, 2424536; 460281, 2424513; 460170, 2424523; 460066, 2424516; 459976, 2424546; 459929, 2424597; 459855, 2424638; 459740, 2424652; 459629, 2424638; 459499, 2424606; 459384, 2424532; 459286, 2424472; 459212, 2424315; 459157, 2424250; 459134, 2424204; 459105, 2424102; 459085, 2424072; 459037, 2423991; 458986, 2423894; 458939, 2423815; 458891, 2423732; 458854, 2423668; 458826, 2423618; 458786, 2423542; 458741, 2423531; 458744, 2423558; 458688, 2423585; 458658, 2423661; 458631, 2423661; 458551, 2423758; 458541, 2423798; 458512, 2423871; 458445, 2423921; 458405, 2423884; 458382, 2423834; 458335, 2423824; 458305, 2423771; 458295, 2423728; 458279, 2423668; 458315, 2423638; 458312, 2423581; 458199, 2423551; 458142, 2423478; return to starting point.

(B) Note: Map 23 follows:

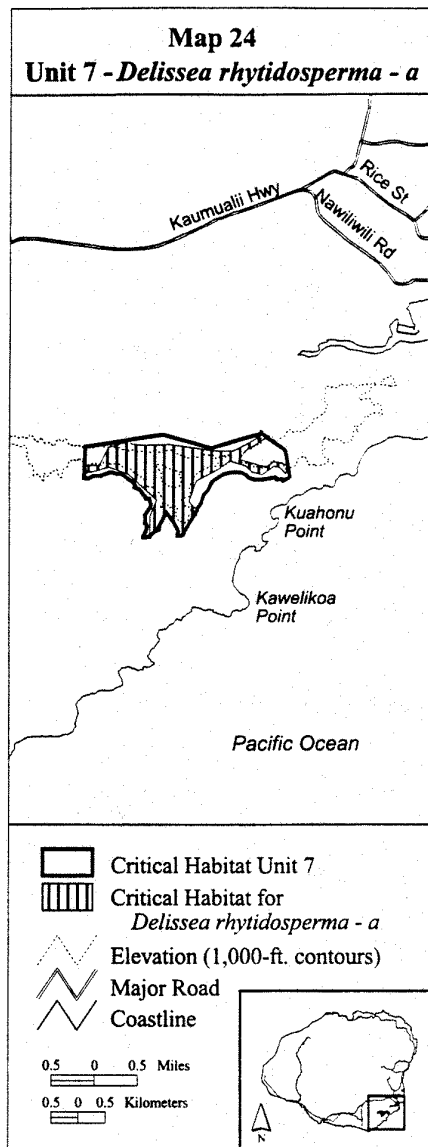


(xxiv) Kauai 7—*Delissea rhytidosperra*—a (221 ha; 545 ac)

(A) Unit consists of the following 53 boundary points: Start at 457776, 2425183; 457996, 2425162; 458503, 2425167; 459357, 2425044; 459695, 2425039; 459982, 2425193; 460156, 2425290; 460184, 2425357; 460210, 2425363; 460315, 2425300; 460202, 2425218; 460110, 2425157; 459890, 2425029; 459823, 2424886; 460294, 2424732; 460443, 2424844; 460683, 2424773; 460693, 2424691; 460663, 2424614; 460555, 2424732; 460443, 2424757; 460228, 2424599; 460038, 2424650; 459920, 2424768; 459634, 2424845; 459393, 2424691; 459009, 2424491; 458866, 2424113; 458958, 2423990; 459032, 2423977; 458955, 2423865; 458897, 2423775; 458840, 2423683; 458785, 2423540; 458756, 2423487; 458737, 2423478; 458661, 2423469; 458671, 2423560; 458523, 2423816; 458446, 2423913; 458293,

2423606; 458134, 2423468; 458139, 2423836; 458267, 2424138; 457955, 2424420; 457735, 2424620; 457371, 2424748; 457156, 2424676; 456952, 2424640; 456931, 2424789; 457197, 2424778; 457361, 2425116; 457765, 2425229; return to starting point.

(B) Note: Map 24 follows:

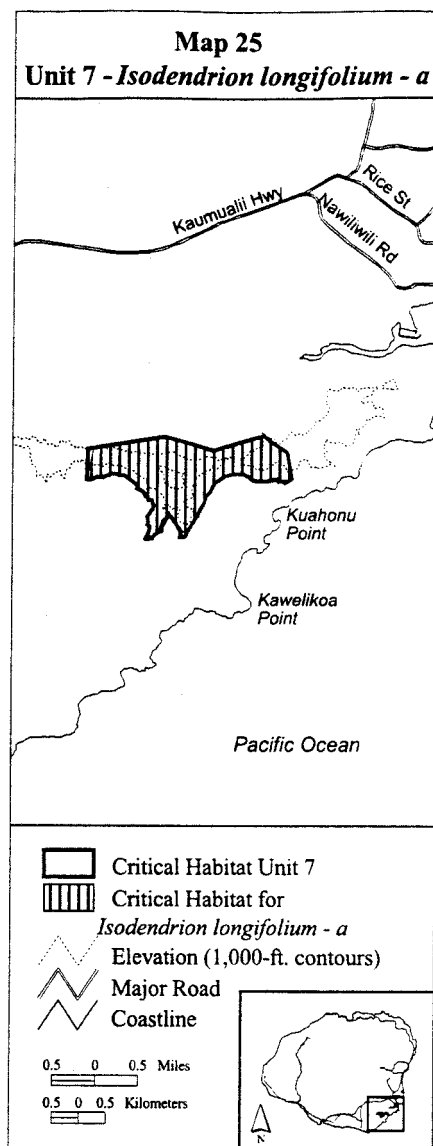


(xxv) Kauai 7—*Isodendron longifolium*—a (337 ha; 833 ac)

(A) Unit consists of the following 127 boundary points: Start at 456913, 2424541; 457040, 2425134; 457651, 2425234; 458371, 2425346; 459277, 2425049; 460211, 2425364; 460651, 2425063; 460662, 2424997; 460736, 2424562; 460732, 2424559; 460721, 2424548; 460705, 2424534; 460602, 2424507; 460593, 2424514; 460496, 2424516; 460475, 2424550; 460373, 2424536; 460281, 2424513; 460213, 2424515; 460213, 2424515; 460213, 2424515; 460209, 2424517; 460185,

2424518; 460184, 2424516; 460184, 2424516; 460184, 2424516; 460169, 2424516; 460068, 2424515; 459976, 2424546; 459929, 2424597; 459855, 2424638; 459740, 2424652; 459629, 2424638; 459499, 2424606; 459384, 2424532; 459286, 2424472; 459212, 2424315; 459157, 2424250; 459134, 2424204; 459105, 2424102; 459085, 2424072; 459037, 2423991; 458982, 2423888; 458939, 2423815; 458890, 2423741; 458869, 2423724; 458842, 2423663; 458811, 2423619; 458777, 2423544; 458741, 2423531; 458744, 2423558; 458688, 2423585; 458658, 2423661; 458631, 2423661; 458551, 2423758; 458541, 2423798; 458512, 2423871; 458445, 2423921; 458405, 2423884; 458382, 2423834; 458335, 2423824; 458305, 2423771; 458295, 2423728; 458279, 2423668; 458315, 2423638; 458312, 2423581; 458199, 2423551; 458142, 2423478; 458142, 2423455; 458117, 2423452; 458106, 2423450; 458058, 2423560; 458086, 2423655; 458073, 2423681; 458043, 2423708; 458049, 2423751; 458049, 2423808; 458039, 2423854; 458066, 2423887; 458092, 2423928; 458096, 2423934; 458119, 2423970; 458122, 2423978; 458149, 2423997; 458162, 2424054; 458136, 2424097; 458136, 2424099; 458133, 2424118; 458126, 2424160; 458066, 2424167; 458043, 2424217; 458009, 2424240; 457966, 2424313; 457930, 2424340; 457853, 2424376; 457860, 2424406; 457833, 2424456; 457640, 2424596; 457594, 2424622; 457527, 2424612; 457504, 2424622; 457474, 2424636; 457421, 2424646; 457371, 2424652; 457358, 2424642; 457321, 2424612; 457298, 2424612; 457252, 2424591; 457238, 2424585; 457218, 2424576; 457204, 2424580; 457203, 2424580; 457195, 2424582; 457148, 2424589; 457099, 2424582; 457036, 2424556; 457019, 2424549; 456995, 2424533; 456994, 2424532; 456986, 2424527; 456979, 2424529; 456977, 2424529; 456926, 2424539; 456919, 2424552; 456919, 2424552; 456919, 2424552; 456917, 2424541; return to starting point.

(B) Note: Map 25 follows:

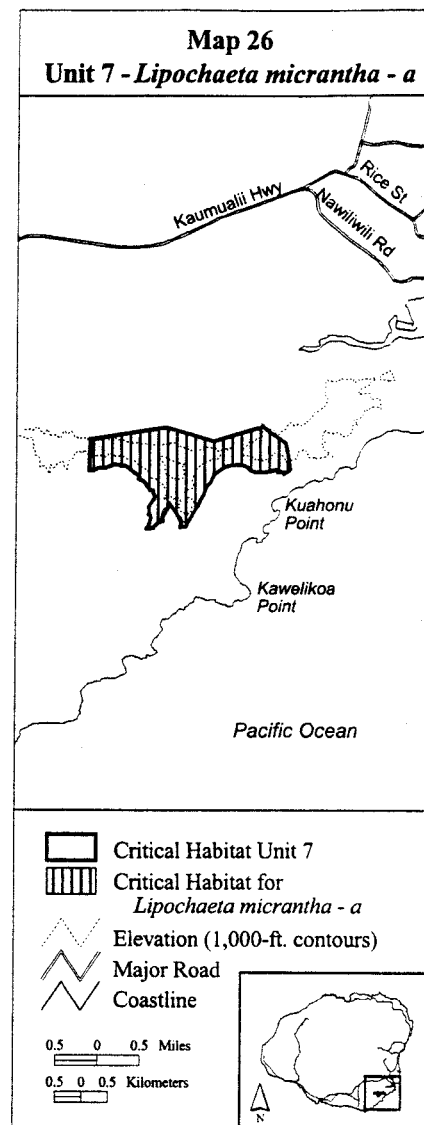


(xxvi) Kauai 7—*Lipochaeta micrantha*—a (341 ha; 842 ac)

(A) Unit consists of the following 125 boundary points: Start at 456916, 2424553; 456952, 2425094; 458386, 2425333; 459277, 2425098; 459948, 2425284; 460206, 2425358; 460327, 2425282; 460590, 2425104; 460617, 2425086; 460649, 2425064; 460662, 2424997; 460736, 2424562; 460732, 2424559; 460721, 2424548; 460705, 2424534; 460688, 2424518; 460619, 2424484; 460594, 2424518; 460497, 2424515; 460475, 2424550; 460373, 2424536; 460281, 2424513; 460213, 2424515; 460209, 2424517; 460185, 2424518; 460184, 2424516; 460178, 2424516; 460073, 2424516; 459976, 2424546; 459929, 2424597; 459855, 2424638; 459740, 2424652; 459629, 2424638; 459499, 2424606; 459384, 2424532; 459286, 2424472; 459212, 2424315; 459157, 2424250; 459134, 2424204; 459105, 2424102; 459085,

2424072; 459037, 2423991; 458985, 2423890; 458939, 2423815; 458892, 2423732; 458852, 2423677; 458849, 2423670; 458825, 2423622; 458784, 2423557; 458741, 2423531; 458744, 2423558; 458688, 2423585; 458658, 2423661; 458631, 2423661; 458551, 2423758; 458541, 2423798; 458512, 2423871; 458445, 2423921; 458405, 2423884; 458382, 2423834; 458335, 2423824; 458305, 2423771; 458295, 2423728; 458279, 2423668; 458315, 2423638; 458312, 2423581; 458199, 2423551; 458142, 2423478; 458142, 2423455; 458117, 2423452; 458106, 2423450; 458074, 2423446; 458031, 2423441; 458021, 2423472; 458036, 2423485; 458058, 2423560; 458086, 2423655; 458073, 2423681; 458043, 2423708; 458049, 2423751; 458049, 2423808; 458039, 2423854; 458066, 2423887; 458092, 2423928; 458096, 2423934; 458119, 2423970; 458122, 2423978; 458149, 2423997; 458162, 2424054; 458136, 2424097; 458136, 2424099; 458133, 2424118; 458126, 2424160; 458066, 2424167; 458043, 2424217; 458009, 2424240; 457966, 2424313; 457930, 2424340; 457853, 2424376; 457860, 2424406; 457833, 2424456; 457640, 2424596; 457594, 2424622; 457527, 2424612; 457504, 2424622; 457474, 2424636; 457421, 2424646; 457371, 2424652; 457358, 2424642; 457321, 2424612; 457298, 2424612; 457252, 2424591; 457238, 2424585; 457218, 2424576; 457204, 2424580; 457203, 2424580; 457195, 2424582; 457148, 2424589; 457099, 2424582; 457036, 2424556; 457019, 2424549; 456995, 2424533; 456919, 2424552; 456919, 2424552; return to starting point.

(B) Note: Map 26 follows:

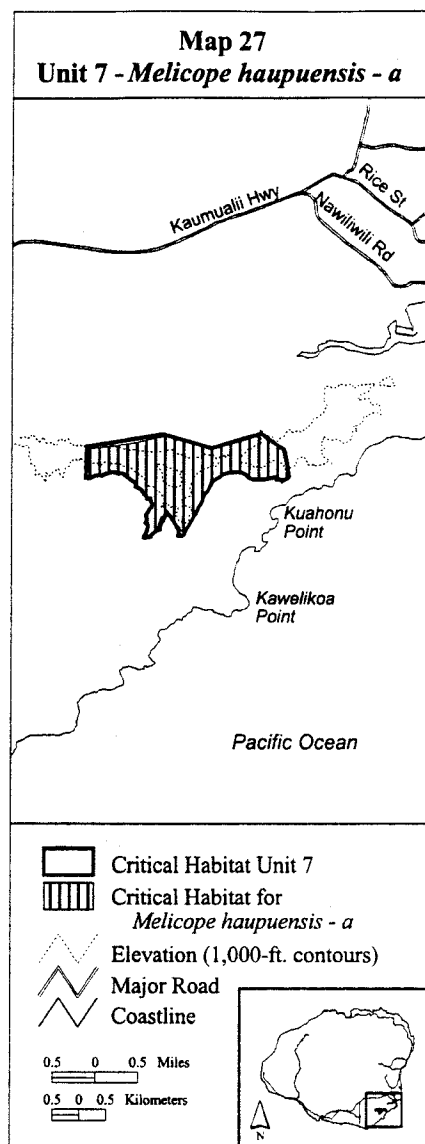


(xxvii) Kauai 7—*Melicope haupuensis*—a (330 ha; 816 ac)

(A) Unit consists of the following 115 boundary points: Start at 456977, 2424529; 456957, 2425070; 457830, 2425189; 458432, 2425322; 458875, 2425201; 459283, 2425089; 459699, 2425210; 459897, 2425266; 460048, 2425310; 460143, 2425340; 460188, 2425357; 460207, 2425364; 460327, 2425282; 460590, 2425104; 460615, 2425036; 460721, 2424548; 460705, 2424534; 460688, 2424518; 460617, 2424483; 460594, 2424517; 460497, 2424515; 460475, 2424550; 460373, 2424536; 460284, 2424515; 460212, 2424516; 460209, 2424517; 460185, 2424518; 460184, 2424516; 460179, 2424516; 460114, 2424515; 460051, 2424519; 460009, 2424534; 459976, 2424546; 459929, 2424597; 459855, 2424638; 459740, 2424652; 459629, 2424638; 459499, 2424606; 459384, 2424532; 459286, 2424472; 459212, 2424315; 459157, 2424250; 459134,

2424204; 459105, 2424102; 459085, 2424072; 459037, 2423991; 458972, 2423889; 458939, 2423815; 458892, 2423732; 458845, 2423670; 458816, 2423623; 458792, 2423564; 458741, 2423531; 458744, 2423558; 458688, 2423585; 458658, 2423661; 458631, 2423661; 458551, 2423758; 458541, 2423798; 458512, 2423871; 458445, 2423921; 458405, 2423884; 458382, 2423834; 458335, 2423824; 458305, 2423771; 458295, 2423728; 458279, 2423668; 458315, 2423638; 458312, 2423581; 458199, 2423551; 458142, 2423478; 458142, 2423455; 458117, 2423452; 458106, 2423450; 458074, 2423446; 458042, 2423453; 458091, 2423660; 458086, 2423872; 458096, 2423934; 458119, 2423970; 458122, 2423978; 458149, 2423997; 458162, 2424054; 458136, 2424097; 458136, 2424099; 458133, 2424118; 458126, 2424160; 458066, 2424167; 458043, 2424217; 458009, 2424240; 457966, 2424313; 457930, 2424340; 457853, 2424376; 457860, 2424406; 457833, 2424456; 457640, 2424596; 457594, 2424622; 457527, 2424612; 457504, 2424622; 457474, 2424636; 457421, 2424646; 457371, 2424652; 457358, 2424642; 457321, 2424612; 457298, 2424612; 457252, 2424591; 457203, 2424580; 457195, 2424582; 457148, 2424589; 457099, 2424582; 457036, 2424556; 457019, 2424549; 456995, 2424533; 456994, 2424532; 456979, 2424529; return to starting point.

(B) Note: Map 27 follows:

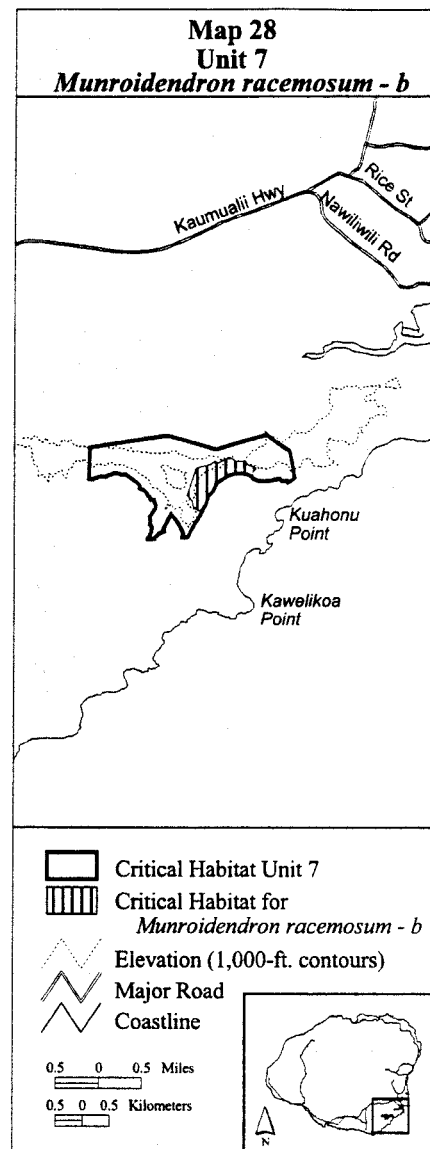


(xxviii) Kauai 7—*Munroidendron racemosum*—b (50 ha; 123 ac)

(A) Unit consists of the following 42 boundary points: Start at 460171, 2424516; 460070, 2424515; 459976, 2424546; 459929, 2424597; 459855, 2424638; 459740, 2424652; 459629, 2424638; 459499, 2424606; 459384, 2424532; 459286, 2424472; 459212, 2424315; 459157, 2424250; 459134, 2424204; 459105, 2424102; 459085, 2424072; 459037, 2423991; 459025, 2423961; 458943, 2423966; 458866, 2424034; 458846, 2424063; 458831, 2424156; 458744, 2424248; 458909, 2424734; 459045, 2424788; 459167, 2424803; 459201, 2424827; 459259, 2424875; 459327, 2424841; 459405, 2424890; 459507, 2424919; 459585, 2424919; 459643, 2424880; 459721, 2424875; 459838, 2424870; 459882, 2424802; 459964, 2424778; 460013, 2424759; 460023, 2424725; 459959, 2424666; 459964, 2424593; 460081,

2424530; 460149, 2424530; return to starting point.

(B) Note: Map 28 follows:

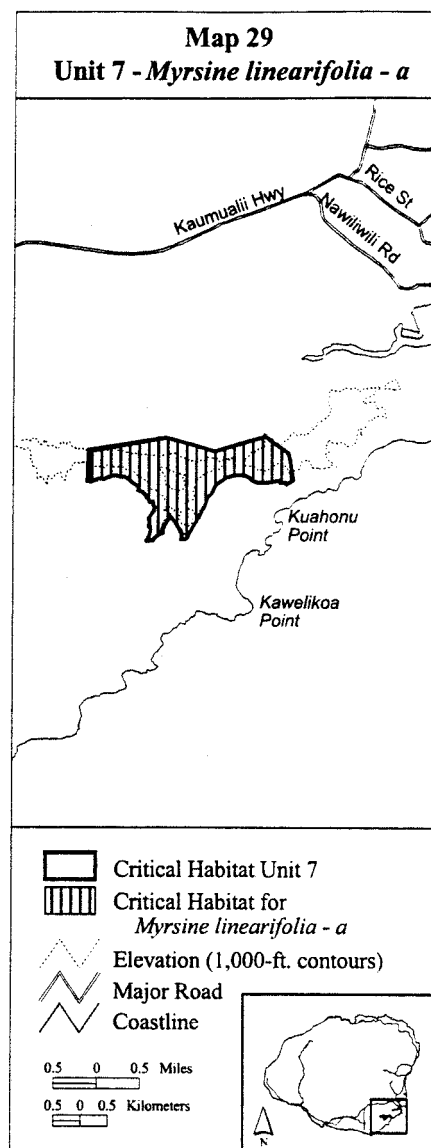


(xxix) Kauai 7—*Myrsine linearifolia*—a (334 ha; 826 ac)

(A) Unit consists of the following 109 boundary points: Start at 460009, 2424534; 459976, 2424546; 459929, 2424597; 459855, 2424638; 459740, 2424652; 459629, 2424638; 459499, 2424606; 459384, 2424532; 459286, 2424472; 459212, 2424315; 459157, 2424250; 459134, 2424204; 459105, 2424102; 459085, 2424072; 459037, 2423991; 458985, 2423890; 458939, 2423815; 458893, 2423731; 458860, 2423681; 458827, 2423624; 458787, 2423540; 458741, 2423531; 458744, 2423558; 458688, 2423585; 458658, 2423661; 458631, 2423661; 458551, 2423758; 458541, 2423798; 458512, 2423871; 458445, 2423921; 458405, 2423884; 458382, 2423834; 458335,

2423824; 458305, 2423771; 458295,
2423728; 458279, 2423668; 458315,
2423638; 458312, 2423581; 458199,
2423551; 458142, 2423478; 458142,
2423455; 458117, 2423452; 458056,
2423466; 458103, 2423665; 458082,
2423889; 458092, 2423928; 458096,
2423934; 458119, 2423970; 458122,
2423978; 458149, 2423997; 458162,
2424054; 458136, 2424097; 458136,
2424099; 458139, 2424114; 458133,
2424118; 458126, 2424160; 458066,
2424167; 458043, 2424217; 458009,
2424240; 457966, 2424313; 457930,
2424340; 457853, 2424376; 457860,
2424406; 457833, 2424456; 457640,
2424596; 457594, 2424622; 457527,
2424612; 457504, 2424622; 457474,
2424636; 457421, 2424646; 457371,
2424652; 457358, 2424642; 457321,
2424612; 457298, 2424612; 457252,
2424591; 457238, 2424585; 457204,
2424580; 457203, 2424580; 457195,
2424582; 457148, 2424589; 457099,
2424582; 457036, 2424556; 456975,
2424548; 456943, 2425070; 458384,
2425331; 459271, 2425086; 459894,
2425257; 460207, 2425364; 460327,
2425282; 460590, 2425104; 460617,
2425086; 460732, 2424559; 460721,
2424548; 460705, 2424534; 460688,
2424518; 460619, 2424484; 460594,
2424517; 460594, 2424517; 460495,
2424517; 460475, 2424550; 460373,
2424536; 460281, 2424513; 460213,
2424515; 460209, 2424517; 460185,
2424518; 460184, 2424516; 460176,
2424516; 460170, 2424523; 460118,
2424515; return to starting point.

(B) Note: Map 29 follows:

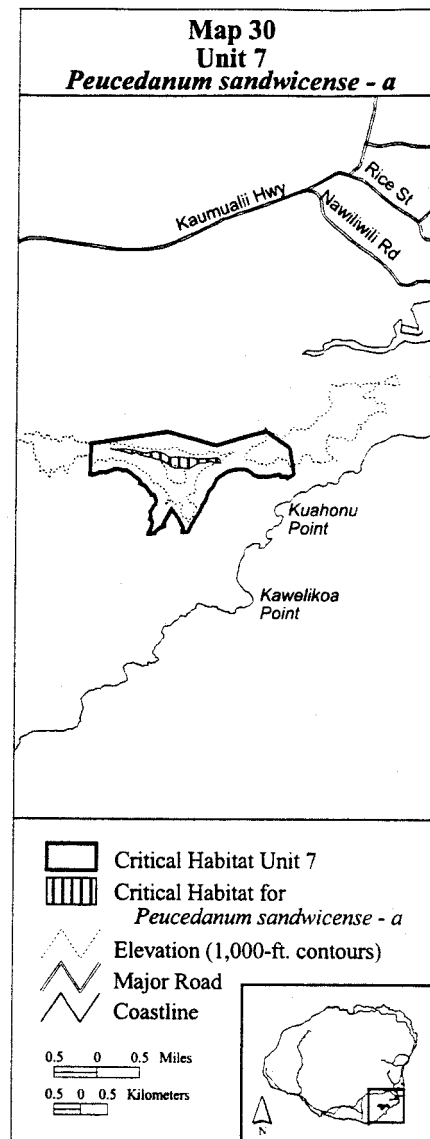


(xxx) Kauai 7—*Peucedanum sandwicense*—a (21 ha; 52 ac)

(A) Unit consists of the following 53 boundary points: Start at 457285, 2425044; 457378, 2425011; 457470, 2425024; 457559, 2425031; 457622, 2425008; 457671, 2425005; 457727, 2425005; 457806, 2424982; 457869, 2424952; 457961, 2424945; 458037, 2424958; 458110, 2424972; 458258, 2424958; 458301, 2424932; 458367, 2424889; 458417, 2424863; 458479, 2424866; 458568, 2424873; 458618, 2424876; 458680, 2424859; 458726, 2424853; 458789, 2424859; 458845, 2424853; 458888, 2424836; 458971, 2424836; 459043, 2424836; 459126, 2424836; 459182, 2424836; 459231, 2424853; 459304, 2424859; 459350, 2424823; 459353, 2424790; 459310, 2424764; 459251, 2424767; 459182, 2424797; 459060, 2424764; 458987, 2424764; 458888, 2424724; 458816, 2424681; 458756, 2424648; 458644,

2424671; 458499, 2424675; 458420, 2424698; 458360, 2424751; 458248, 2424803; 458050, 2424863; 457830, 2424909; 457787, 2424955; 457721, 2424949; 457691, 2424925; 457599, 2424958; 457421, 2425001; 457338, 2425005; return to starting point.

(B) Note: Map 30 follows:

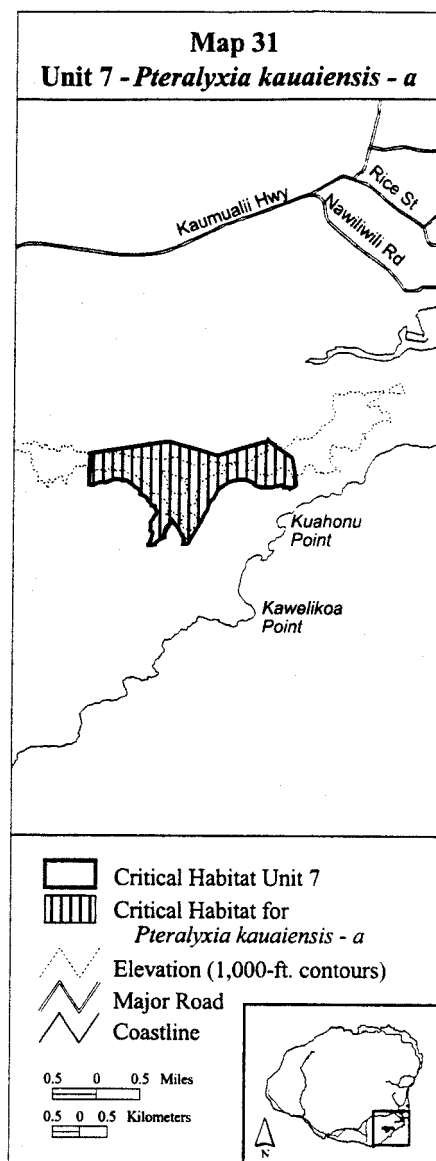


(xxxi) Kauai 7—*Pteralyxia kauaiensis*—a (346 ha; 854 ac)

(A) Unit consists of the following 149 boundary points: Start at 460212, 2424515; 460204, 2424515; 460183, 2424515; 460180, 2424516; 460074, 2424516; 460073, 2424516; 460066, 2424516; 460017, 2424532; 460009, 2424534; 459976, 2424546; 459929, 2424597; 459855, 2424638; 459740, 2424652; 459629, 2424638; 459499, 2424606; 459384, 2424532; 459286, 2424472; 459212, 2424315; 459157, 2424250; 459134, 2424204; 459105, 2424102; 459085, 2424072; 459037,

2423991; 458985, 2423890; 458939,
 2423815; 458894, 2423737; 458893,
 2423735; 458892, 2423732; 458890,
 2423730; 458851, 2423668; 458827,
 2423621; 458787, 2423543; 458741,
 2423531; 458744, 2423558; 458688,
 2423585; 458658, 2423661; 458631,
 2423661; 458551, 2423758; 458541,
 2423798; 458512, 2423871; 458445,
 2423921; 458405, 2423884; 458382,
 2423834; 458335, 2423824; 458305,
 2423771; 458295, 2423728; 458279,
 2423668; 458315, 2423638; 458312,
 2423581; 458199, 2423551; 458142,
 2423478; 458142, 2423455; 458117,
 2423452; 458106, 2423450; 458074,
 2423446; 458031, 2423441; 458029,
 2423440; 458011, 2423438; 458009,
 2423462; 458021, 2423472; 458021,
 2423472; 458036, 2423485; 458058,
 2423560; 458086, 2423655; 458073,
 2423681; 458043, 2423708; 458049,
 2423751; 458049, 2423808; 458039,
 2423854; 458066, 2423887; 458092,
 2423928; 458096, 2423934; 458119,
 2423970; 458122, 2423978; 458149,
 2423997; 458162, 2424054; 458136,
 2424097; 458136, 2424099; 458133,
 2424118; 458126, 2424160; 458066,
 2424167; 458043, 2424217; 458009,
 2424240; 457966, 2424313; 457930,
 2424340; 457853, 2424376; 457860,
 2424406; 457833, 2424456; 457640,
 2424596; 457594, 2424622; 457527,
 2424612; 457504, 2424622; 457474,
 2424636; 457421, 2424646; 457371,
 2424652; 457358, 2424642; 457321,
 2424612; 457298, 2424612; 457252,
 2424591; 457238, 2424585; 457218,
 2424576; 457204, 2424580; 457203,
 2424580; 457195, 2424582; 457148,
 2424589; 457099, 2424582; 457036,
 2424556; 457019, 2424549; 456995,
 2424533; 456994, 2424532; 456986,
 2424527; 456979, 2424529; 456977,
 2424529; 456926, 2424539; 456919,
 2424552; 456919, 2424552; 456919,
 2424552; 456917, 2424541; 456913,
 2424541; 456912, 2424542; 456911,
 2424542; 456922, 2424860; 456931,
 2425122; 456931, 2425122; 458355,
 2425346; 458360, 2425344; 458369,
 2425346; 458371, 2425346; 458372,
 2425346; 459274, 2425092; 460209,
 2425362; 460217, 2425356; 460218,
 2425356; 460651, 2425063; 460662,
 2424997; 460736, 2424562; 460732,
 2424559; 460721, 2424548; 460705,
 2424534; 460688, 2424518; 460619,
 2424484; 460596, 2424515; 460497,
 2424515; 460495, 2424517; 460495,
 2424517; 460475, 2424550; 460373,
 2424536; 460281, 2424513; 460214,
 2424515; return to starting point.

(B) Note: Map 31 follows:

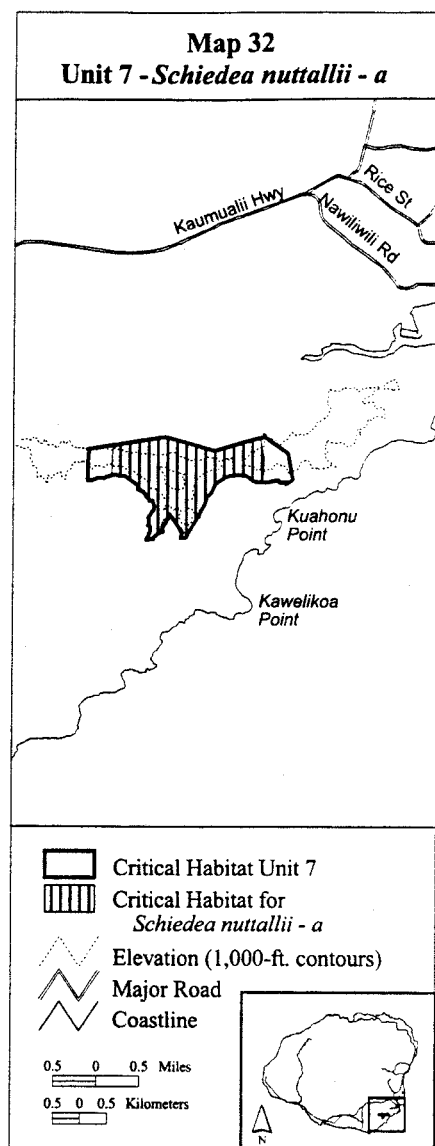


(xxxii) Kauai 7—*Schiedea nuttallii*—a
 (282 ha; 697 ac)

(A) Unit consists of the following 93 boundary points: Start at 460009, 2424534; 459976, 2424546; 459929, 2424597; 459855, 2424638; 459740, 2424652; 459629, 2424638; 459499, 2424606; 459384, 2424532; 459286, 2424472; 459212, 2424315; 459157, 2424250; 459134, 2424204; 459105, 2424102; 459085, 2424072; 459037, 2423991; 458985, 2423890; 458939, 2423815; 458893, 2423731; 458860, 2423681; 458827, 2423624; 458787, 2423540; 458741, 2423531; 458744, 2423558; 458688, 2423585; 458658, 2423661; 458631, 2423661; 458551, 2423758; 458541, 2423798; 458512, 2423871; 458445, 2423921; 458405, 2423884; 458382, 2423834; 458335, 2423824; 458305, 2423771; 458295, 2423728; 458279, 2423668; 458315, 2423638; 458312, 2423581; 458199,

2423551; 458142, 2423478; 458142, 2423455; 458117, 2423452; 458106, 2423450; 458074, 2423446; 458031, 2423441; 458029, 2423440; 458021, 2423472; 458036, 2423485; 458058, 2423560; 458086, 2423655; 458073, 2423681; 458043, 2423708; 458049, 2423751; 458049, 2423808; 458039, 2423854; 458066, 2423887; 458092, 2423928; 458096, 2423934; 458119, 2423970; 458122, 2423978; 458149, 2423997; 458162, 2424054; 458136, 2424097; 458136, 2424099; 458133, 2424118; 458126, 2424160; 458066, 2424167; 458043, 2424217; 458009, 2424240; 457966, 2424313; 457930, 2424340; 457853, 2424376; 457860, 2424406; 457833, 2424456; 457640, 2424596; 457594, 2424622; 457527, 2424612; 457504, 2424622; 457474, 2424636; 457421, 2424646; 457371, 2424652; 457358, 2424642; 457377, 2425117; 457456, 2425204; 457651, 2425234; 458369, 2425346; 459306, 2425071; 460130, 2425340; 460207, 2424964; 460176, 2424516; 460170, 2424523; 460118, 2424515; 460074, 2424516; return to starting point.

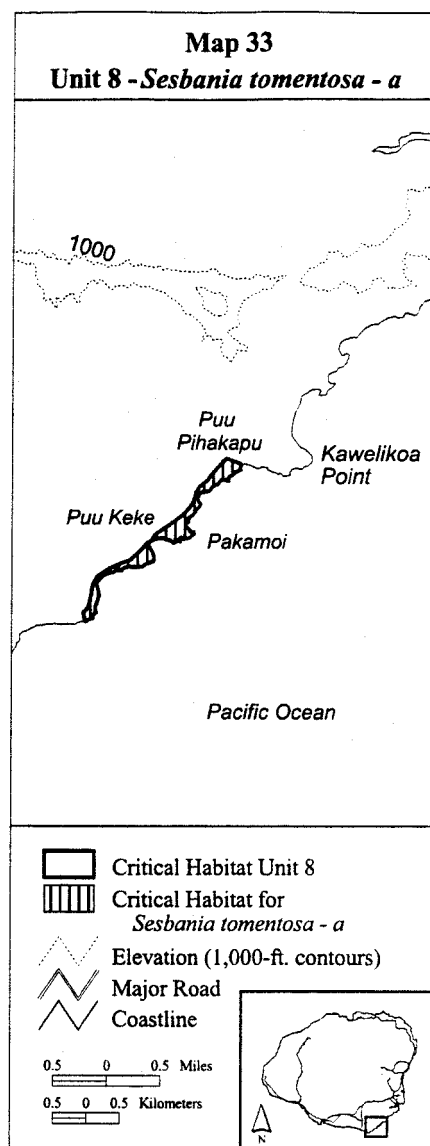
(B) Note: Map 32 follows:



(xxxiii) Kauai 8—*Sesbania tomentosa*—a (47 ha; 117 ac)

(A) Unit consists of the following 26 boundary points: coastline; 458938, 2422136; 456613, 2419801; 456582, 2419934; 456653, 2420011; 456705, 2420236; 456722, 2420354; 456790, 2420479; 456952, 2420581; 457154, 2420676; 457284, 2420717; 457481, 2420921; 457534, 2420977; 457598, 2421003; 457649, 2421080; 457665, 2421106; 457862, 2421239; 458083, 2421412; 458182, 2421516; 458226, 2421605; 458262, 2421722; 458324, 2421821; 458434, 2421911; 458499, 2422001; 458665, 2422178; 458720, 2422231; 458912, 2422161; coastline.

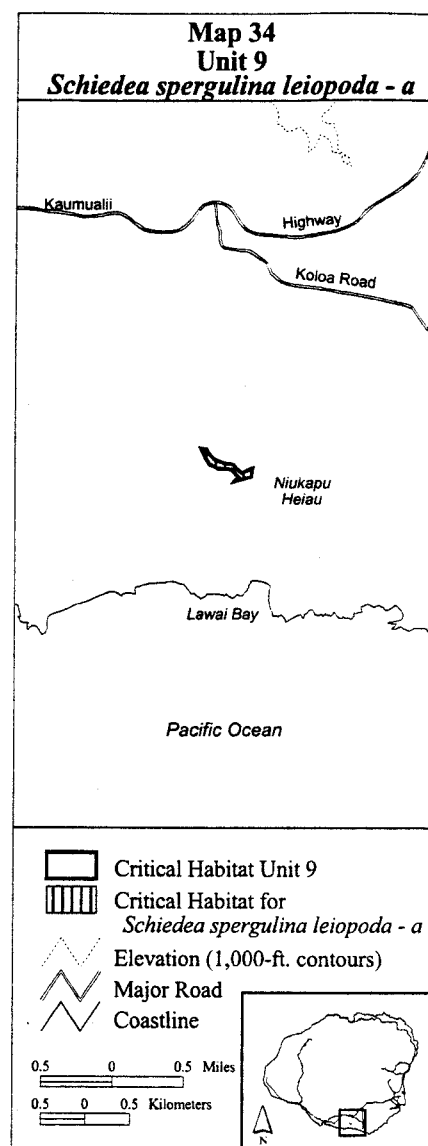
(B) **Note:** Map 33 follows:



(xxxiv) Kauai 9—*Schiedea spergulina* var. *leiopoda*—a (5 ha; 11 ac)

(A) Unit consists of the following 23 boundary points: Start at 447953, 2421713; 447951, 2421694; 447757, 2421647; 447804, 2421699; 447721, 2421781; 447613, 2421788; 447569, 2421791; 447544, 2421803; 447473, 2421836; 447445, 2421889; 447380, 2422014; 447420, 2422010; 447443, 2422008; 447482, 2421943; 447527, 2421894; 447574, 2421872; 447636, 2421848; 447702, 2421846; 447752, 2421830; 447806, 2421767; 447843, 2421739; 447843, 2421739; 447961, 2421793; return to starting point.

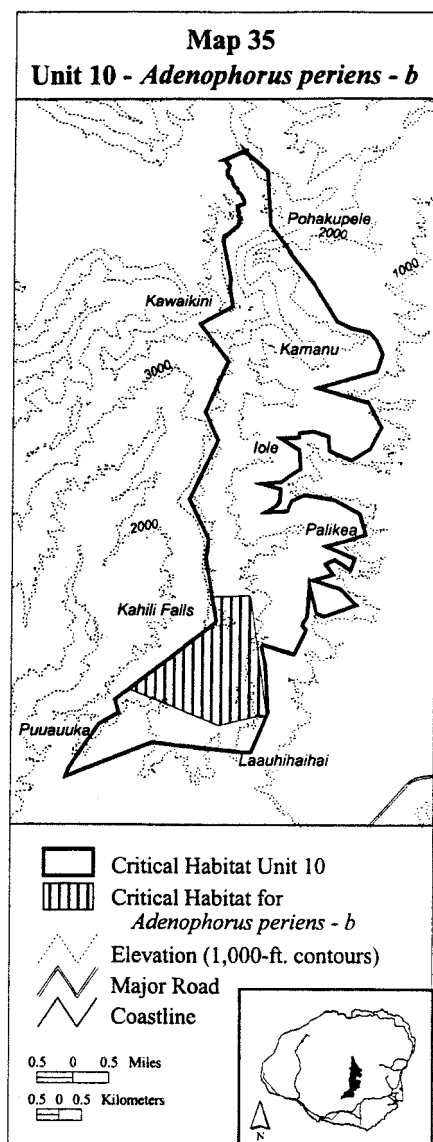
(B) **Note:** Map 34 follows:



(xxxv) Kauai 10—*Adenophorus periens*—b (491 ha; 1,215 ac)

(A) Unit consists of the following 13 boundary points: Start at 448417, 2432669; 449262, 2432700; 449291, 2432590; 449659, 2430034; 449634, 2429983; 449569, 2430034; 448593, 2429793; 446563, 2430607; 447808, 2431562; 448023, 2431693; 448011, 2431718; 448515, 2432105; 448503, 2432172; return to starting point.

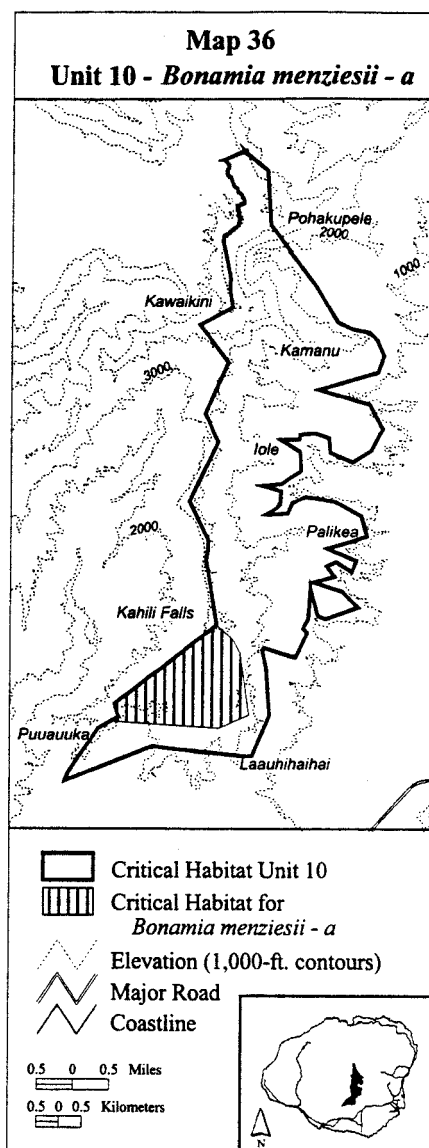
(B) **Note:** Map 35 follows:



(xxxvi) Kauai 10—*Bonamia menziesii*—a (421 ha; 1,039 ac)

(A) Unit consists of the following 8 boundary points: Start at 448513, 2432103; 448882, 2431783; 449031, 2431495; 449240, 2430109; 448586, 2429812; 446148, 2429968; 446327, 2430072; 446237, 2430356; return to starting point.

(B) Note: Map 36 follows:

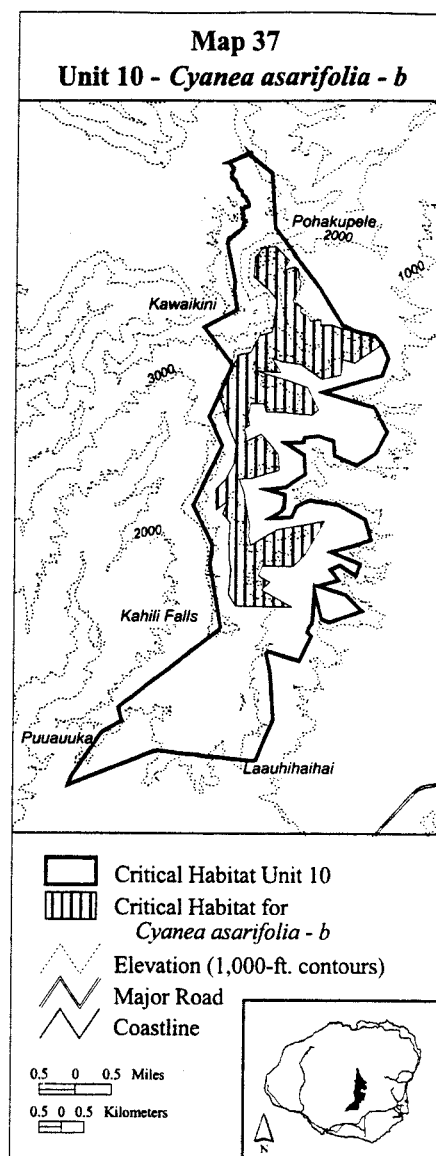


(xxxvii) Kauai 10—*Cyanea asarifolia*—b (903 ha; 2,232 ac)

(A) Unit consists of the following 103 boundary points: Start at 451083, 2438783; 451901, 2438605; 452064, 2438426; 451856, 2438263; 451455, 2437996; 451187, 2438070; 451143, 2437728; 450727, 2437639; 450252, 2437966; 449850, 2438026; 449613, 2438100; 449806, 2437788; 449271, 2437818; 449925, 2437625; 450415, 2437446; 450653, 2436956; 450519, 2436837; 449776, 2436897; 449494, 2436897; 449449, 2437090; 449152, 2437105; 449093, 2436808; 449122, 2436615; 449018, 2436541; 449063, 2436318; 449018, 2436229; 449390, 2436422; 449628, 2436125; 449761, 2435976; 449791, 2435605; 449167, 2435427; 448900, 2435412; 449018, 2435115; 449078, 2434773; 449137, 2434416; 449122, 2434149; 449167, 2433956; 449761, 2434298; 450816, 2434491; 450400, 2433763; 450118,

2433481; 449449, 2433495; 449345, 2433287; 449613, 2433139; 449420, 2432961; 450088, 2432589; 448840, 2432604; 448677, 2432872; 448706, 2433154; 448736, 2433421; 448692, 2433629; 448677, 2434030; 448706, 2434461; 448543, 2434654; 448662, 2434921; 448394, 2434743; 448380, 2435189; 448617, 2435427; 448781, 2435753; 448825, 2436169; 448647, 2436630; 448544, 2437006; 448458, 2437328; 448714, 2437911; 448825, 2438056; 448840, 2438160; 449137, 2438219; 449330, 2438605; 449613, 2438679; 449712, 2439392; 449522, 2439625; 449191, 2439915; 449211, 2440336; 449375, 2440536; 449671, 2440580; 449971, 2440270; 449870, 2440076; 449899, 2440063; 450011, 2440098; 450059, 2440101; 450106, 2440129; 450147, 2440093; 450162, 2440075; 450162, 2440075; 450185, 2440030; 450190, 2440016; 450203, 2439969; 450175, 2439897; 450247, 2439815; 450203, 2439630; 450115, 2439486; 450071, 2439407; 450084, 2439338; 450175, 2439294; 450238, 2439250; 450252, 2439220; 450237, 2439156; 450297, 2439075; 450379, 2439062; 450463, 2438924; 450671, 2438949; 450714, 2438836; 450940, 2438833; return to starting point.

(B) Note: Map 37 follows:

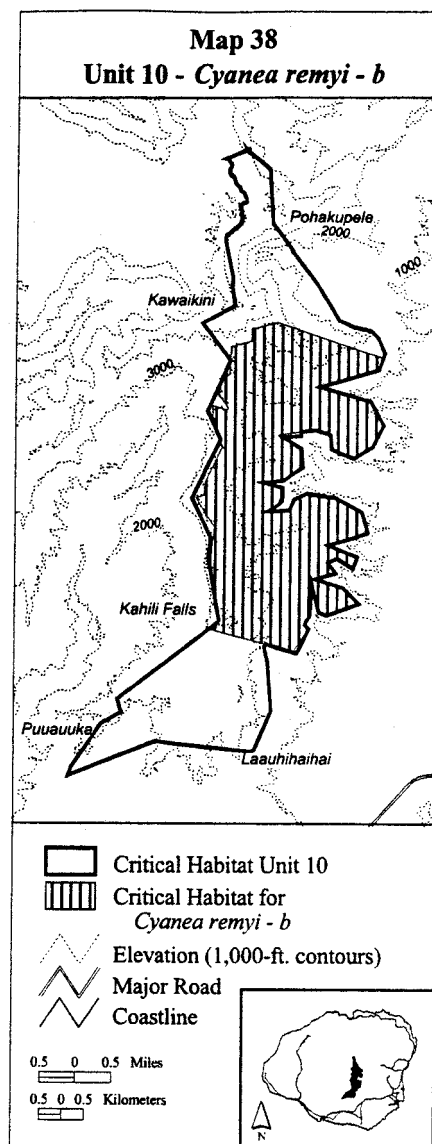


(xxxviii) Kauai 10—*Cyanea remyi*—b (1,904 ha; 4,705 ac)

(A) Unit consists of the following 71 boundary points: Start at 449428, 2431642; 448291, 2431933; 448515, 2432105; 448503, 2432172; 448417, 2432669; 448308, 2433302; 448343, 2433782; 448405, 2434199; 447967, 2434846; 448155, 2434909; 448176, 2435180; 448551, 2435973; 448503, 2436133; 448515, 2436159; 448453, 2436296; 448343, 2436661; 448343, 2436932; 448656, 2436828; 448697, 2436870; 448489, 2437141; 448465, 2437344; 448553, 2437544; 448718, 2437621; 448739, 2438246; 449198, 2438372; 449198, 2438643; 449782, 2438789; 452161, 2437996; 452078, 2437725; 450763, 2437349; 451890, 2437015; 452182, 2436473; 451932, 2435993; 451514, 2435722; 451014, 2435931; 450993, 2436264; 450659, 2436369; 449845, 2436265; 450346,

2435952; 450367, 2435514; 449908, 2435222; 449490, 2435201; 449929, 2435075; 449908, 2434825; 449845, 2434700; 449595, 2434554; 450075, 2434575; 450179, 2434804; 450471, 2434950; 451118, 2434846; 451723, 2434533; 451848, 2434074; 451431, 2433928; 450972, 2433803; 451619, 2433532; 451514, 2433281; 451160, 2433511; 450951, 2433406; 451139, 2433177; 450680, 2433052; 451285, 2432864; 451660, 2432488; 450930, 2432238; 450763, 2432322; 450596, 2432927; 450555, 2432217; 450429, 2432050; 450533, 2431929; 450459, 2431769; 450429, 2431800; 450200, 2431445; return to starting point.

(B) Note: Map 38 follows:

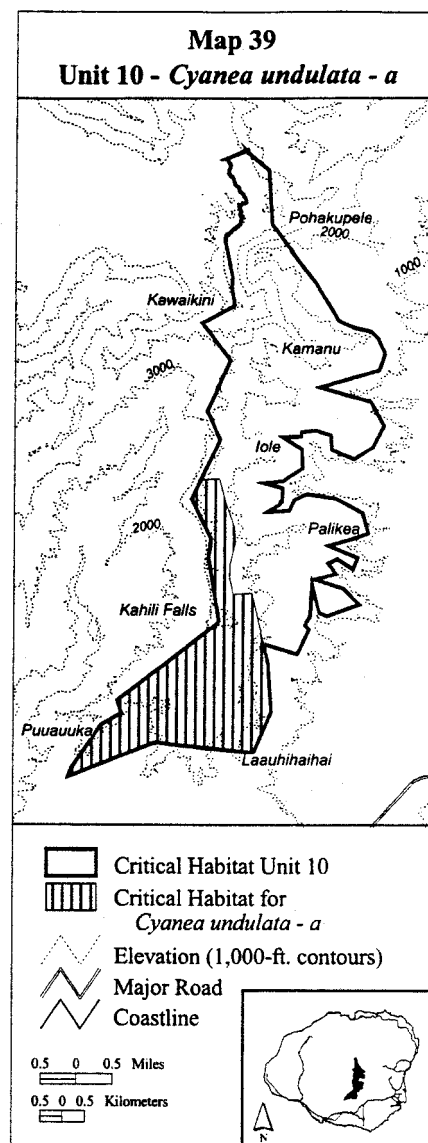


(xxxix) Kauai 10—*Cyanea undulata*—a (1,005 ha; 2,484 ac)

(A) Unit consists of the following 28 boundary points: Start at 448088, 2435267; 448504, 2435281; 448661,

2434734; 448844, 2434201; 448877, 2433868; 448746, 2433374; 448740, 2433286; 448740, 2433060; 448779, 2432916; 448823, 2432729; 449256, 2432753; 449617, 2431161; 449696, 2430088; 449318, 2429191; 447115, 2429408; 447101, 2429410; 447100, 2429410; 447092, 2429411; 445133, 2428627; 445203, 2428817; 445869, 2429806; 446327, 2430072; 446237, 2430356; 448515, 2432105; 448503, 2432172; 448267, 2433542; 448319, 2433974; 447886, 2434845; return to starting point.

(B) Note: Map 39 follows:



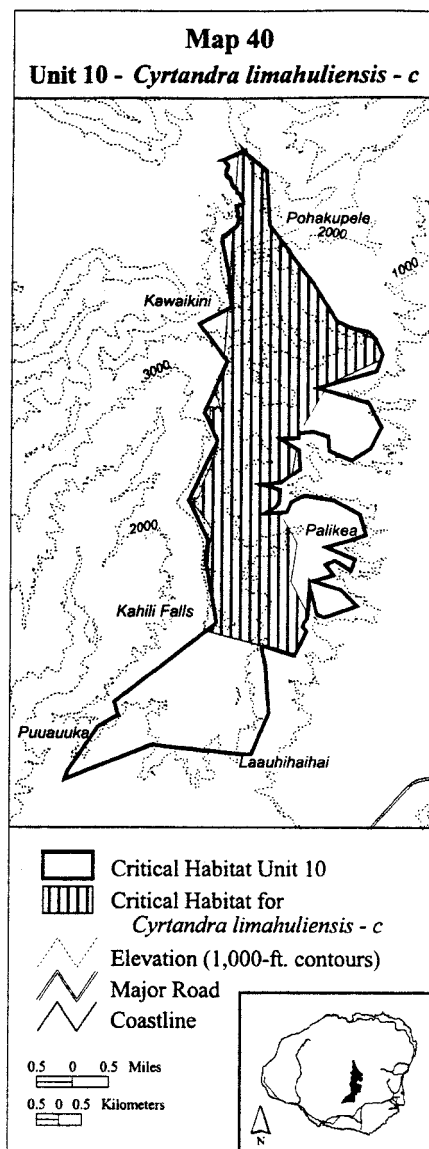
(xl) Kauai 10—*Cyrtandra limahuliensis*—c (2,013 ha; 4,975 ac)

(A) Unit consists of the following 172 boundary points: Start at 450986, 2437413; 450763, 2437349; 450920, 2437303; 450356, 2436356; 450332, 2436229; 449924, 2436215; 450288, 2435988; 450188, 2435455; 450167,

2435387; 450091, 2435338; 449939, 2435224; 449909, 2435222; 449908, 2435222; 449889, 2435221; 449520, 2435192; 449929, 2435075; 449908, 2434825; 449890, 2434790; 449906, 2434762; 449866, 2434742; 449845, 2434700; 449602, 2434558; 449641, 2434556; 449926, 2434568; 450308, 2433891; 450180, 2433045; 450561, 2432319; 450555, 2432217; 450489, 2432130; 450442, 2432036; 450533, 2431929; 450364, 2431564; 450270, 2431394; 449620, 2431593; 449428, 2431642; 448291, 2431933; 448515, 2432105; 448503, 2432172; 448417, 2432669; 448308, 2433302; 448343, 2433782; 448405, 2434199; 448223, 2434468; 447893, 2434860; 447894, 2434861; 448013, 2434861; 448101, 2434891; 448168, 2435077; 448176, 2435180; 448299, 2435441; 448519, 2436050; 448518, 2436082; 448503, 2436133; 448515, 2436159; 448453, 2436296; 448343, 2436661; 448343, 2436932; 448488, 2436884; 448486, 2436941; 448585, 2436875; 448512, 2437111; 448489, 2437141; 448480, 2437211; 448450, 2437310; 448728, 2437943; 448662, 2438032; 448728, 2439126; 448819, 2439175; 448756, 2439586; 448770, 2439804; 448837, 2440912; 448841, 2440914; 448861, 2440927; 448877, 2440939; 448918, 2440982; 448940, 2441006; 448941, 2441024; 448943, 2441044; 448943, 2441053; 448943, 2441063; 448944, 2441075; 448948, 2441084; 448954, 2441097; 448964, 2441109; 448969, 2441116; 448971, 2441119; 448972, 2441136; 448973, 2441143; 448972, 2441150; 448967, 2441159; 448961, 2441163; 448949, 2441170; 448941, 2441177; 448933, 2441184; 448930, 2441194; 448926, 2441212; 448934, 2441230; 448940, 2441238; 448944, 2441250; 448946, 2441259; 448948, 2441264; 448948, 2441273; 448948, 2441281; 448944, 2441291; 448935, 2441302; 448928, 2441313; 448925, 2441322; 448920, 2441333; 448919, 2441341; 448917, 2441357; 448916, 2441369; 448918, 2441381; 448922, 2441392; 448930, 2441400; 448936, 2441403; 448940, 2441404; 448945, 2441411; 448948, 2441420; 448952, 2441427; 448964, 2441441; 448971, 2441443; 449003, 2441449; 449032, 2441461; 449040, 2441466; 449049, 2441471; 449053, 2441472; 449060, 2441481; 449064, 2441492; 449065, 2441502; 449066, 2441511; 449061, 2441528; 449050, 2441561; 449046, 2441569; 449043, 2441578; 449037, 2441588; 449030, 2441595; 449017, 2441611; 449012, 2441616; 449009, 2441625; 449006, 2441639; 449004, 2441650; 449000, 2441660; 448995, 2441668; 448986, 2441677; 448972,

2441689; 448957, 2441700; 448939, 2441710; 448933, 2441715; 448925, 2441722; 448915, 2441738; 448913, 2441753; 448914, 2441760; 448913, 2441774; 448915, 2441796; 448910, 2441807; 448900, 2441814; 448892, 2441817; 448898, 2441915; 448939, 2442579; 449163, 2442553; 449589, 2442203; 449662, 2441006; 449663, 2440988; 450101, 2440409; 450094, 2440396; 450653, 2439686; 451170, 2438845; 452064, 2438419; 452203, 2438108; 452189, 2438063; 452160, 2437988; 451002, 2437441; return to starting point.

(B) Note: Map 40 follows:

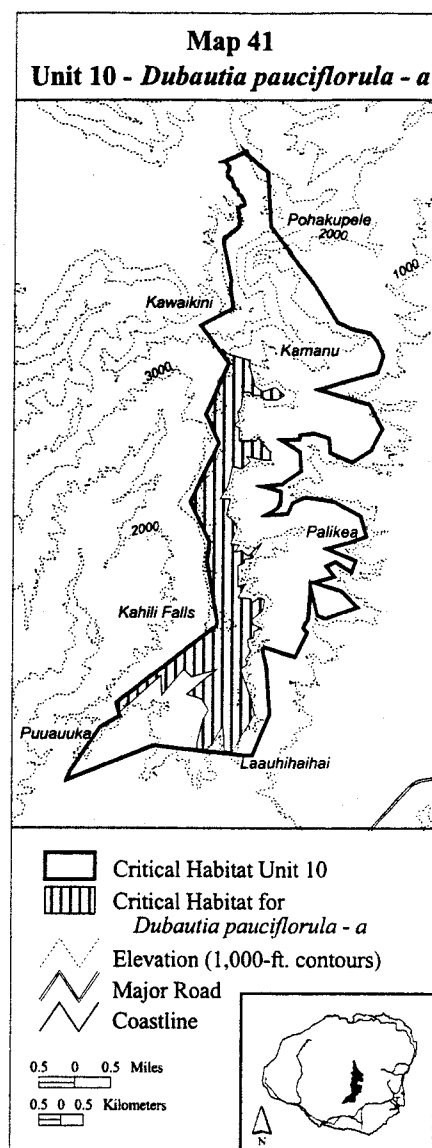


(xli) Kauai 10—*Dubautia pauciflora*—a (814 ha; 2,012 ac)

(A) Unit consists of the following 96 boundary points: Start at 448697, 2438146; 449173, 2438007; 449213, 2437809; 449273, 2437571; 449312, 2437432; 449491, 2437293; 449788,

2437392; 449987, 2437214; 449808, 2437114; 449570, 2437114; 449451, 2437214; 449273, 2437214; 449174, 2437313; 449054, 2437273; 449015, 2436936; 448935, 2436857; 448975, 2436658; 448856, 2436559; 448975, 2436500; 448975, 2436202; 449372, 2436202; 449392, 2436281; 449669, 2435944; 449669, 2435766; 449550, 2435766; 449134, 2435865; 449233, 2435746; 449035, 2435567; 448816, 2435627; 448737, 2435191; 448559, 2434913; 448777, 2434913; 448697, 2434556; 448876, 2434417; 448935, 2434219; 448797, 2433921; 448995, 2433881; 448896, 2433723; 449055, 2433762; 449193, 2433643; 449511, 2433941; 449293, 2433584; 449114, 2433564; 449114, 2433485; 448955, 2433405; 448975, 2433167; 448955, 2432949; 449154, 2433009; 448975, 2432711; 449253, 2432691; 449273, 2432592; 449451, 2432711; 449570, 2432671; 449531, 2432414; 449273, 2432215; 449312, 2432116; 449511, 2432037; 449332, 2431957; 449332, 2431819; 449193, 2431779; 449213, 2431600; 449273, 2431521; 449154, 2431342; 449193, 2431223; 449035, 2431104; 449154, 2430787; 449273, 2430450; 449352, 2430093; 448856, 2429259; 448678, 2429299; 448658, 2429855; 448283, 2429271; 448109, 2429291; 448055, 2429297; 448063, 2429438; 448201, 2429974; 448320, 2430192; 448162, 2430450; 447825, 2430549; 448499, 2431104; 447944, 2430926; 447765, 2431104; 447269, 2430529; 447249, 2430966; 446310, 2430125; 446237, 2430356; 448515, 2432105; 448503, 2432172; 448267, 2433542; 448319, 2433974; 447886, 2434845; 448515, 2436159; 448226, 2436801; 448728, 2437943; 448612, 2438099; 448598, 2438245; return to starting point.

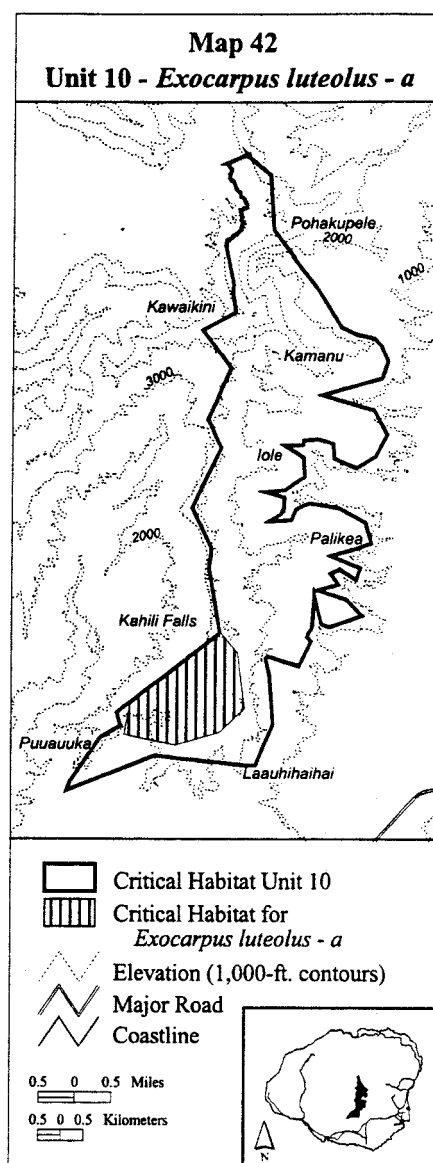
(B) Note: Map 41 follows:



(xlii) Kauai 10—*Exocarpos luteolus*—a (401 ha; 991 ac)

(A) Unit consists of the following 10 boundary points: Start at 448504, 2432168; 448908, 2431685; 449077, 2430445; 448532, 2429929; 447543, 2429635; 446414, 2429881; 446462, 2430141; 446530, 2430532; 446530, 2430581; 448515, 2432105; return to starting point.

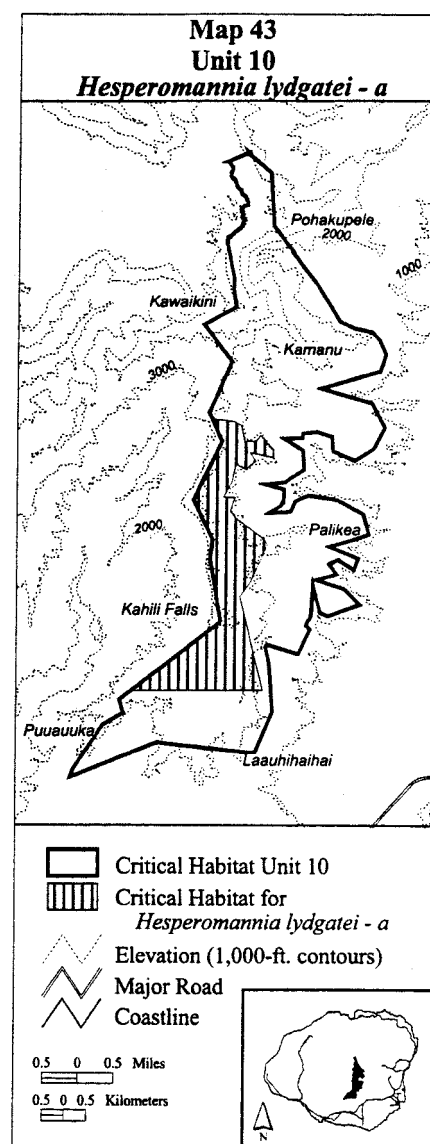
(B) **Note:** Map 42 follows:



(xliii) Kauai 10—*Hesperomannia lydgatei*—a (646 ha; 1,596 ac)

(A) Unit consists of the following 29 boundary points: Start at 448286, 2436668; 448802, 2436599; 448953, 2436524; 449029, 2436158; 449294, 2436158; 449395, 2436284; 449672, 2435981; 449672, 2435780; 449155, 2435893; 449281, 2435704; 449067, 2435527; 448840, 2435641; 448751, 2435237; 448562, 2434909; 448827, 2434897; 448713, 2434594; 448877, 2434417; 449496, 2433951; 449559, 2433825; 449193, 2433005; 448953, 2432677; 449466, 2430577; 446508, 2430564; 448515, 2432105; 448503, 2432172; 448267, 2433542; 448319, 2433974; 447886, 2434845; 448515, 2436159; return to starting point.

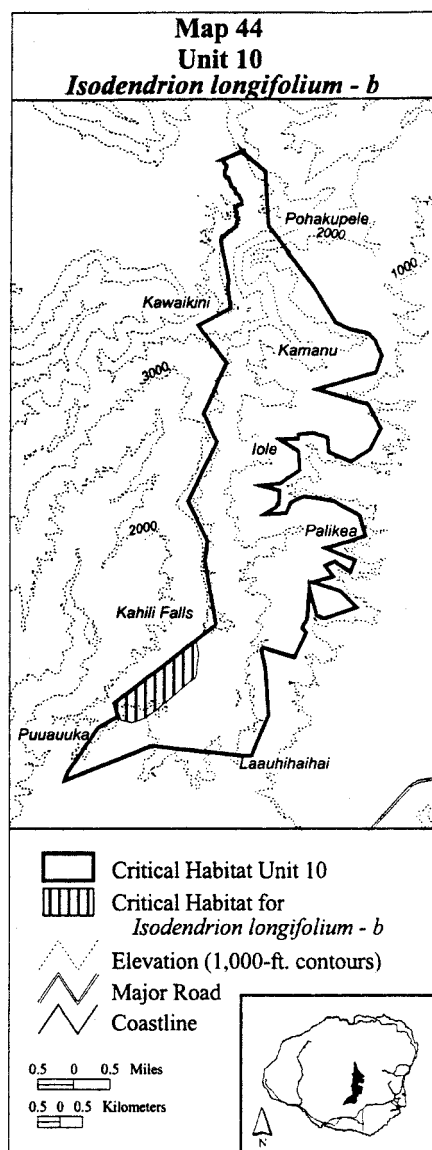
(B) **Note:** Map 43 follows:



(xliv) Kauai 10—*Isodendron longifolium*—b (142 ha; 350 ac)

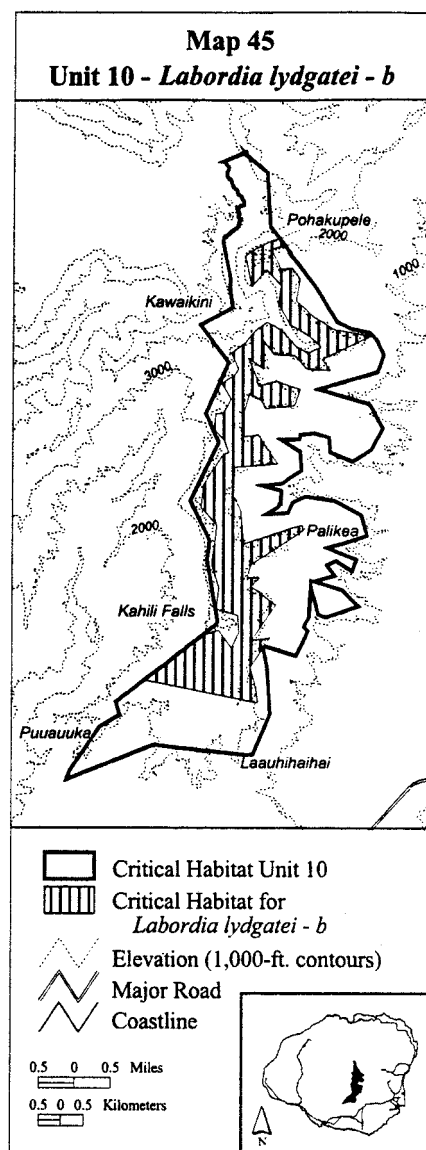
(A) Unit consists of the following 14 boundary points: Start at 448057, 2430921; 448043, 2430923; 447940, 2430853; 447794, 2430722; 447574, 2430543; 447170, 2430191; 446888, 2429999; 446635, 2429933; 446414, 2429985; 446295, 2430053; 446327, 2430072; 446237, 2430356; 448077, 2431769; 448127, 2431466; return to starting point.

(B) **Note:** Map 44 follows:



2438293; 450535, 2438535; 450100, 2438800; 449835, 2439259; 449907, 2439669; 449773, 2439813; 449569, 2440031; 449255, 2439645; 449122, 2440175; 449086, 2440321; 449255, 2440442; 449617, 2440635; 449861, 2440726; 449987, 2440561; 449690, 2440490; 449823, 2440174; 449883, 2440031; 449894, 2440032; 450149, 2440055; 450318, 2439814; 450245, 2439331; 450632, 2438969; 450873, 2438824; 451090, 2438679; 451911, 2438534; 450825, 2438003; 451018, 2437762; 450487, 2437810; 450221, 2438100; 449762, 2438124; 449521, 2438414; 449521, 2437810; 449183, 2438028; 449352, 2437617; 449400, 2437424; 449810, 2437521; 450342, 2437352; 450221, 2436989; 449569, 2436917; 449472, 2437110; 449207, 2437255; 449086, 2436845; 449086, 2436555; 449086, 2436289; 449400, 2436314; 449835, 2435686; 448869, 2435589; 448844, 2434961; 449014, 2434623; 449086, 2433875; 450390, 2434309; 450414, 2434165; 449255, 2433416; 449158, 2433126; 449448, 2433126; 449255, 2432933; 449810, 2432523; return to starting point.

(B) Note: Map 45 follows:



(xlv) Kauai 10—*Labordia lydgatei*—b (1,035 ha; 2,558 ac)

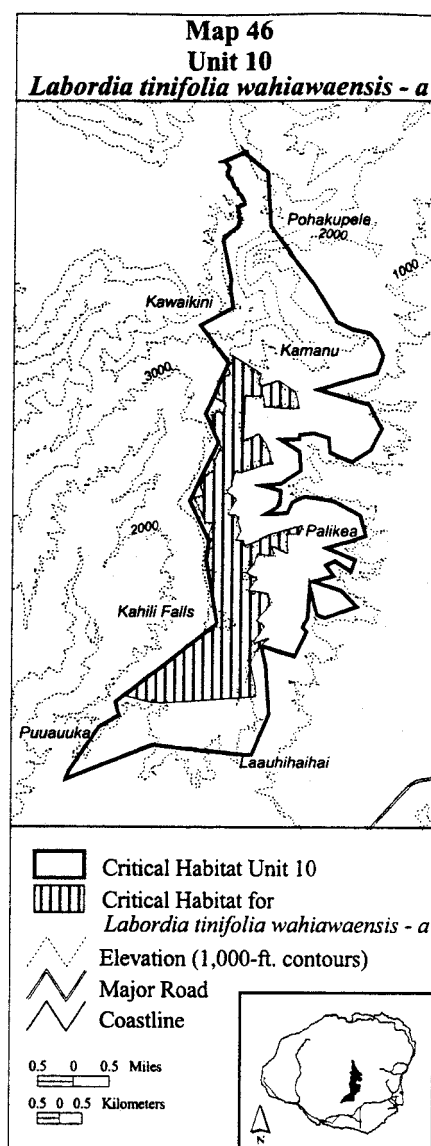
(A) Unit consists of the following 97 boundary points: Start at 449391, 2431894; 449279, 2431726; 449412, 2431749; 449690, 2431798; 449457, 2431436; 449255, 2431122; 449376, 2430639; 449421, 2430343; 446873, 2430844; 448170, 2431840; 448531, 2431943; 448820, 2431557; 448989, 2431895; 448965, 2432281; 448482, 2432426; 448508, 2432672; 448531, 2432885; 448362, 2433440; 448458, 2434020; 448482, 2434310; 448120, 2434696; 448168, 2435203; 448627, 2435903; 448748, 2435927; 448627, 2436217; 448410, 2436458; 448458, 2436796; 448603, 2436796; 448724, 2436965; 448796, 2437134; 448579, 2437473; 448869, 2437666; 448965, 2437810; 448796, 2438149; 449110, 2438390; 449327, 2438655; 449593, 2438848; 449931, 2438655; 450245, 2438317; 450511, 2438148; 450801,

(xlv) Kauai 10—*Labordia tinifolia* var. *wahiawaensis*—a (913 ha; 2,255 ac)

(A) Unit consists of the following 89 boundary points: Start at 448798, 2438127; 449165, 2437887; 449468, 2437696; 449420, 2437473; 449516, 2437425; 449867, 2437552; 450250, 2437297; 450329, 2436930; 450170, 2436914; 449563, 2436962; 449516, 2437201; 449117, 2437201; 449101, 2436627; 449069, 2436196; 449436, 2436356; 449579, 2436132; 449739, 2435670; 449579, 2435654; 449021, 2435463; 448893, 2435494; 448814, 2435175; 448718, 2435048; 448941, 2434888; 448750, 2434537; 448941, 2434521; 449037, 2434154; 448941, 2433963; 449101, 2433963; 449117, 2433835; 449468, 2433979; 449659, 2434090; 450425, 2434298; 450361, 2434106; 450074, 2434106; 450090, 2433676; 449739, 2433835; 449771, 2433628; 449420, 2433660; 449324, 2433436; 449165, 2433245; 449404,

2433133; 449228, 2432846; 449420, 2432830; 449659, 2432782; 449707, 2432527; 449420, 2432192; 449595, 2432048; 449340, 2431713; 449356, 2431681; 449675, 2431777; 449404, 2431506; 449276, 2431218; 449388, 2430692; 449404, 2430484; 449404, 2430484; 447362, 2430345; 447060, 2430364; 446435, 2430508; 448515, 2432105; 448503, 2432172; 448267, 2433542; 448294, 2433768; 448383, 2433787; 448415, 2433963; 448303, 2434059; 448415, 2434362; 448223, 2434362; 448111, 2434649; 447968, 2434904; 448191, 2434968; 448127, 2435159; 448207, 2435415; 448415, 2435510; 448415, 2435750; 448574, 2436037; 448494, 2436244; 448462, 2436277; 448367, 2436488; 448367, 2436771; 448526, 2436866; 448606, 2436787; 448670, 2437058; 448446, 2437186; 448510, 2437313; 448510, 2437448; 448571, 2437587; 448766, 2437696; 448718, 2437856; 448829, 2437999; return to starting point.

(B) Note: Map 46 follows:

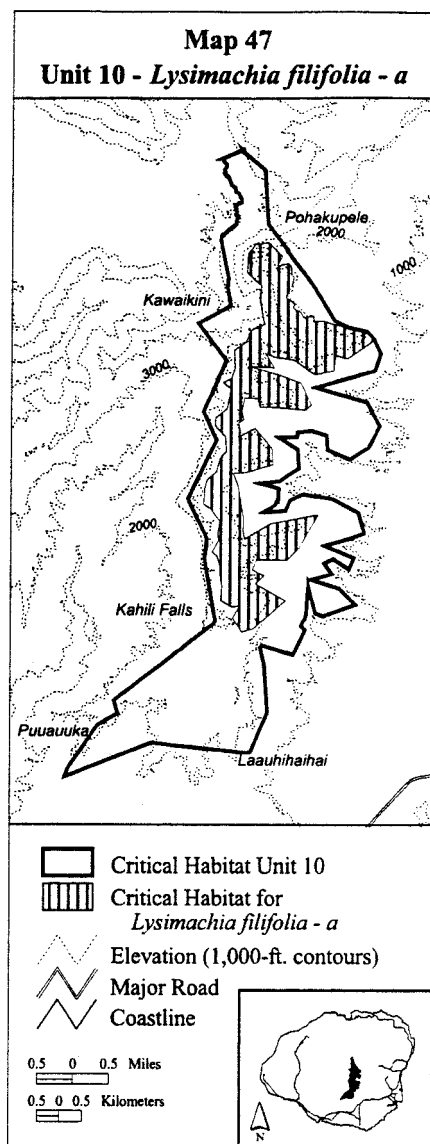


2433481; 449449, 2433495; 449345, 2433287; 449613, 2433139; 449420, 2432961; 450088, 2432589; 449381, 2431977; 449117, 2431900; 448904, 2432197; 449065, 2432473; 448889, 2432462; 448635, 2432590; 448650, 2432917; 448613, 2433130; 448599, 2433373; 448547, 2433571; 448444, 2433659; 448580, 2433916; 448573, 2434107; 448610, 2434346; 448386, 2434622; 448239, 2434732; 448261, 2435063; 448312, 2435268; 448522, 2435445; 448610, 2435753; 448749, 2435904; 448720, 2436242; 448496, 2436469; 448485, 2436660; 448753, 2436862; 448830, 2437318; 448669, 2437450; 448845, 2437549; 448922, 2437766; 448915, 2438166; 449164, 2438353; 449293, 2438629; 449580, 2438754; 449469, 2439364; 449522, 2439625; 449191, 2439915; 449211, 2440336; 449375, 2440536; 449671, 2440580; 449971, 2440270; 449870, 2440076; 449899, 2440063; 450011, 2440098; 450059, 2440101; 450106, 2440129; 450147, 2440093; 450162, 2440075; 450162, 2440075; 450185, 2440030; 450190, 2440016; 450203, 2439969; 450175, 2439897; 450247, 2439815; 450203, 2439630; 450115, 2439486; 450071, 2439407; 450084, 2439338; 450175, 2439294; 450238, 2439250; 450252, 2439220; 450237, 2439156; 450297, 2439075; 450379, 2439062; 450463, 2438924; 450671, 2438949; 450714, 2438836; 450940, 2438833; return to starting point.

(B) Note: Map 47 follows:

(xlvii) Kauai 10—*Lysimachia filifolia*—a (995 ha; 2,458 ac)

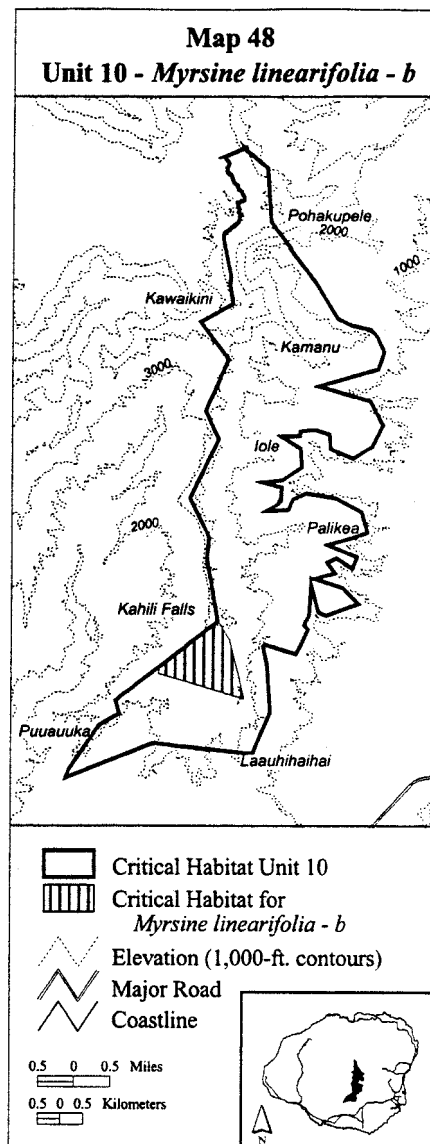
(A) Unit consists of the following 113 boundary points: Start at 451083, 2438783; 451901, 2438605; 452064, 2438426; 451856, 2438263; 451455, 2437996; 451187, 2438070; 451143, 2437728; 450727, 2437639; 450252, 2437966; 449850, 2438026; 449613, 2438100; 449806, 2437788; 449271, 2437818; 449925, 2437625; 450415, 2437446; 450653, 2436956; 450519, 2436837; 449776, 2436897; 449494, 2436897; 449449, 2437090; 449152, 2437105; 449093, 2436808; 449122, 2436615; 449018, 2436541; 449063, 2436318; 449018, 2436229; 449390, 2436422; 449628, 2436125; 449761, 2435976; 449791, 2435605; 449167, 2435427; 448900, 2435412; 449018, 2435115; 449078, 2434773; 449137, 2434416; 449122, 2434149; 449167, 2433956; 449761, 2434298; 450816, 2434491; 450400, 2433763; 450118,



(xlvi) Kauai 10—*Myrsine linearifolia*—b (167 ha; 413 ac)

(A) Unit consists of the following 6 boundary points: Start at 448507, 2432148; 448782, 2431712; 449112, 2430394; 447193, 2430959; 447222, 2431112; 448515, 2432105; return to starting point.

(B) Note: Map 48 follows:

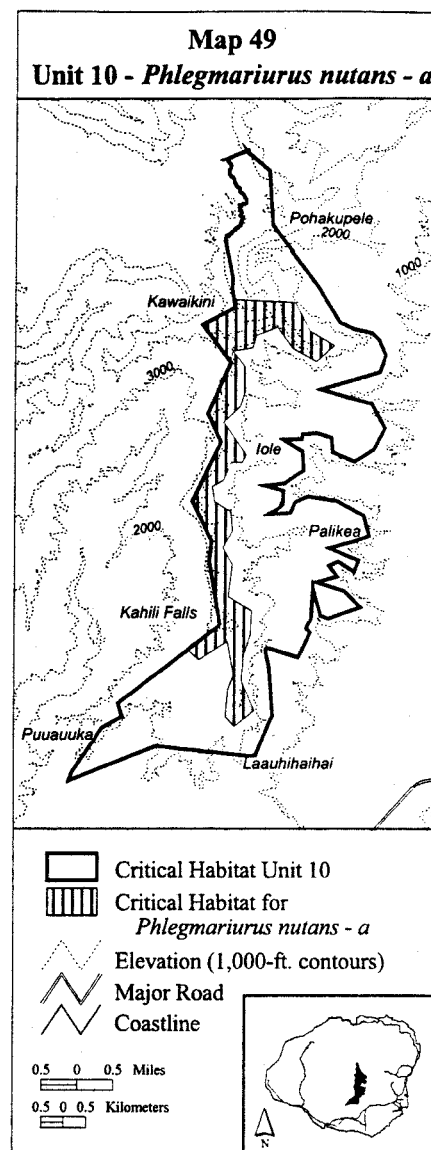


(xlix) Kauai 10—*Phlegmariurus nutans*—a (620 ha; 1,533 ac)

(A) Unit consists of the following 47 boundary points: Start at 448793, 2439345; 450186, 2439278; 450512, 2438647; 451062, 2438321; 450655, 2437974; 450105, 2438280; 449779, 2438728; 449310, 2438545; 449228, 2438280; 448780, 2438199; 449045, 2437852; 449065, 2437302; 448943, 2436956; 448576, 2436610; 449086, 2435876; 449004, 2435713; 448760, 2435713; 448576, 2435306; 448332, 2435163; 448373, 2434837; 448739, 2434613; 448780, 2434165; 448576, 2433818; 448780, 2433452; 448699, 2432739; 449229, 2432413; 449208, 2431903; 449045, 2431434; 449004, 2430864; 449290, 2430212; 448841, 2429845; 448638, 2430069; 448699, 2430681; 448821, 2430986; 448678, 2431740; 448047, 2431333; 447800, 2431556; 448515, 2432105; 448503, 2432172; 448267, 2433542; 448319,

2433974; 447886, 2434845; 448515, 2436159; 448226, 2436801; 448728, 2437943; 448103, 2438785; 448819, 2439175; return to starting point.

(B) Note: Map 49 follows:



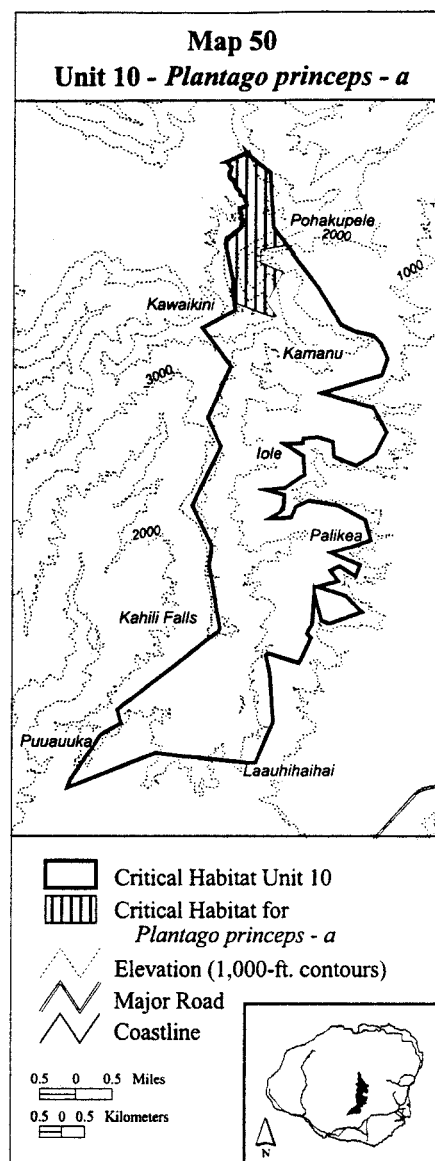
(l) Kauai 10—*Plantago princeps*—a (276 ha; 683 ac)

(A) Unit consists of the following 195 boundary points: Start at 449378, 2440492; 449378, 2440219; 449753, 2440049; 449884, 2440014; 449514, 2439343; 449731, 2439042; 449653, 2439026; 448873, 2439316; 448605, 2440582; 448605, 2440585; 448604, 2440594; 448603, 2440603; 448601, 2440618; 448600, 2440627; 448599, 2440637; 448600, 2440668; 448601, 2440679; 448606, 2440704; 448612, 2440722; 448615, 2440731; 448619, 2440740; 448622, 2440749; 448630, 2440759; 448638, 2440764; 448650, 2440769; 448663, 2440773; 448678, 2440780; 448691, 2440790; 448711,

2440806; 448720, 2440813; 448727,
2440820; 448735, 2440829; 448745,
2440841; 448764, 2440857; 448788,
2440878; 448802, 2440889; 448811,
2440896; 448841, 2440914; 448861,
2440927; 448877, 2440939; 448918,
2440982; 448940, 2441006; 448941,
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2442572; 449576, 2442210; 449620,
2441513; 449654, 2441008; 449662,
2441006; 449663, 2440988; 449955,
2440602; return to starting point.

(B) Note: Map 50 follows:



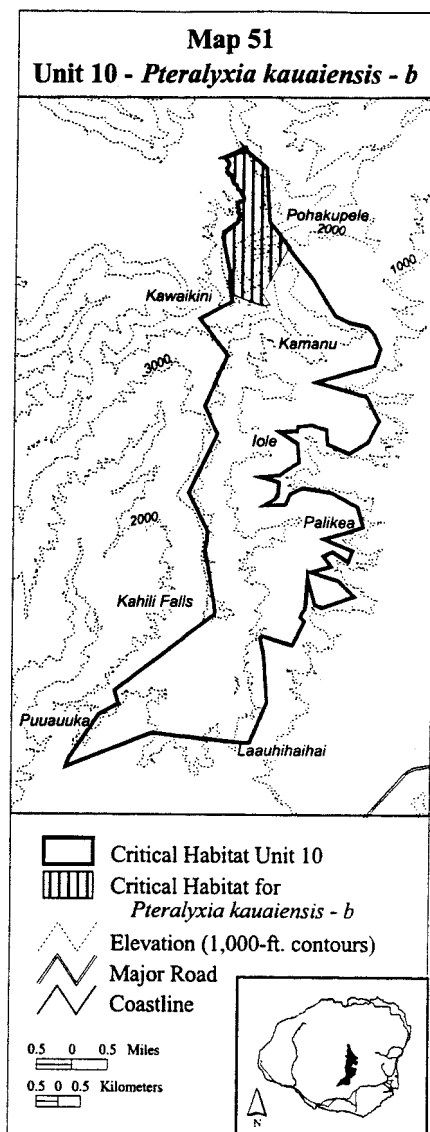
(li) Kauai 10—*Pteralyxia kauaiensis*—b
(304 ha; 751 ac)

(A) Unit consists of the following 183
boundary points: Start at 448642,
2442419; 449125, 2442584; 449589,
2442203; 449662, 2441006; 449663,

2440988; 450101, 2440409; 449514,
2439343; 449691, 2439097; 449529,
2439072; 448873, 2439316; 448605,
2440582; 448605, 2440585; 448604,
2440594; 448603, 2440603; 448601,
2440618; 448600, 2440627; 448599,
2440637; 448600, 2440668; 448601,
2440679; 448606, 2440704; 448612,
2440722; 448615, 2440731; 448619,
2440740; 448622, 2440749; 448630,
2440759; 448638, 2440764; 448650,
2440769; 448663, 2440773; 448678,
2440780; 448691, 2440790; 448711,
2440806; 448720, 2440813; 448727,
2440820; 448735, 2440829; 448745,
2440841; 448764, 2440857; 448788,
2440878; 448802, 2440889; 448811,
2440896; 448841, 2440914; 448861,
2440927; 448877, 2440939; 448918,
2440982; 448940, 2441006; 448941,
2441024; 448943, 2441044; 448943,
2441053; 448943, 2441063; 448944,
2441075; 448948, 2441084; 448954,
2441097; 448964, 2441109; 448969,
2441116; 448971, 2441119; 448972,
2441136; 448973, 2441143; 448972,
2441150; 448967, 2441159; 448961,
2441163; 448949, 2441170; 448941,
2441177; 448933, 2441184; 448930,
2441194; 448926, 2441212; 448934,
2441230; 448940, 2441238; 448944,
2441250; 448946, 2441259; 448948,
2441264; 448948, 2441273; 448948,
2441281; 448944, 2441291; 448935,
2441302; 448928, 2441313; 448925,
2441322; 448920, 2441333; 448919,
2441341; 448917, 2441357; 448916,
2441369; 448918, 2441381; 448922,
2441392; 448930, 2441400; 448936,
2441403; 448940, 2441404; 448945,
2441411; 448948, 2441420; 448952,
2441427; 448964, 2441441; 448971,
2441443; 449003, 2441449; 449032,
2441461; 449040, 2441466; 449049,
2441471; 449053, 2441472; 449060,
2441481; 449064, 2441492; 449065,
2441502; 449066, 2441511; 449061,
2441528; 449050, 2441561; 449046,
2441569; 449043, 2441578; 449037,
2441588; 449030, 2441595; 449017,
2441611; 449012, 2441616; 449009,
2441625; 449006, 2441639; 449004,
2441650; 449000, 2441660; 448995,
2441668; 448986, 2441677; 448972,
2441689; 448957, 2441700; 448939,
2441710; 448933, 2441715; 448925,
2441722; 448915, 2441738; 448913,
2441753; 448914, 2441760; 448913,
2441774; 448915, 2441796; 448910,
2441807; 448900, 2441814; 448890,
2441818; 448884, 2441820; 448877,
2441825; 448850, 2441844; 448840,
2441852; 448831, 2441859; 448820,
2441871; 448817, 2441884; 448814,
2441894; 448813, 2441900; 448803,
2441914; 448789, 2441938; 448787,
2441967; 448781, 2441990; 448777,
2442002; 448773, 2442013; 448768,

2442019; 448764, 2442029; 448755, 2442041; 448746, 2442051; 448736, 2442055; 448728, 2442058; 448723, 2442061; 448718, 2442069; 448710, 2442077; 448694, 2442089; 448683, 2442101; 448677, 2442115; 448675, 2442123; 448677, 2442140; 448682, 2442148; 448684, 2442157; 448680, 2442169; 448674, 2442187; 448671, 2442202; 448673, 2442209; 448678, 2442221; 448684, 2442226; 448692, 2442233; 448699, 2442238; 448705, 2442250; 448706, 2442257; 448707, 2442267; 448712, 2442283; 448718, 2442295; 448722, 2442303; 448723, 2442309; 448724, 2442320; 448721, 2442331; 448711, 2442341; 448697, 2442342; 448682, 2442350; 448677, 2442356; 448673, 2442365; 448671, 2442369; 448665, 2442379; 448657, 2442387; 448648, 2442399; 448643, 2442410; return to starting point.

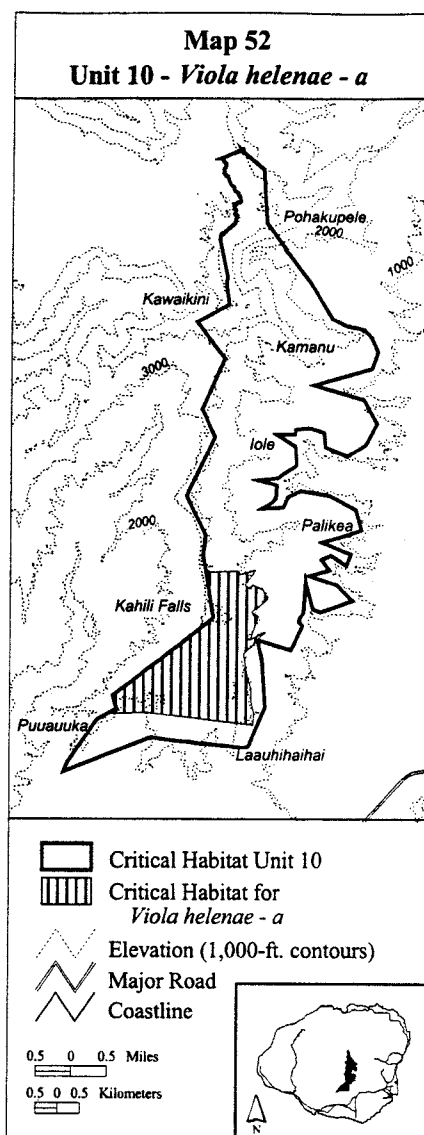
(B) Note: Map 51 follows:



(lii) Kauai 10—*Viola helenae*—a (611 ha; 1,510 ac)

(A) Unit consists of the following 31 boundary points: Start at 448328, 2433188; 448454, 2433140; 449088, 2433152; 449076, 2433067; 449466, 2433177; 449222, 2432836; 449320, 2432763; 449405, 2432848; 449636, 2432738; 449746, 2432531; 449527, 2432361; 449380, 2432239; 449551, 2432153; 449344, 2431617; 449685, 2431800; 449417, 2431508; 449198, 2431301; 449234, 2431142; 449271, 2430923; 449320, 2430692; 449380, 2430484; 449380, 2430229; 449441, 2429961; 449429, 2429693; 446980, 2429985; 446274, 2429948; 446193, 2429994; 446327, 2430072; 446237, 2430356; 448515, 2432105; 448503, 2432172; return to starting point.

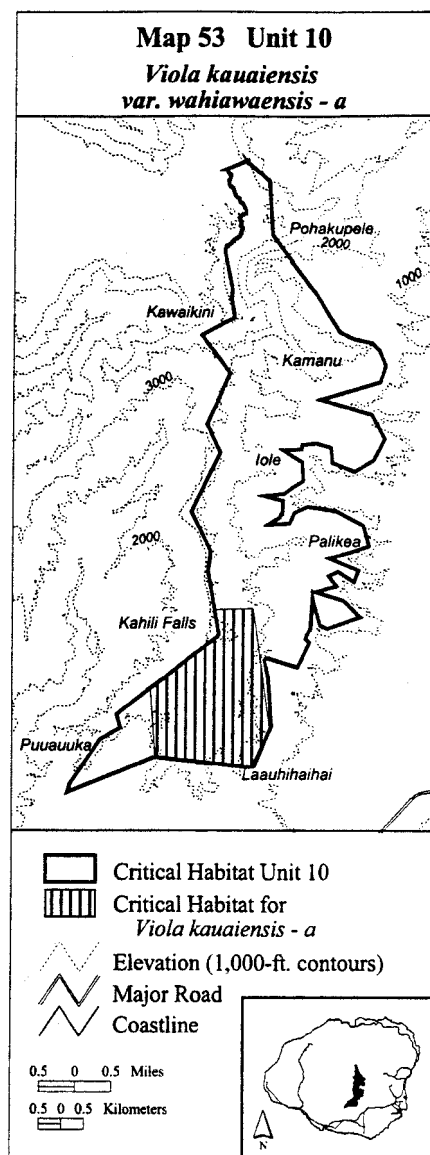
(B) Note: Map 52 follows:



(liii) Kauai 10—*Viola kauaiensis* var. *wahiawaensis*—a (657 ha; 1,623 ac)

(A) Unit consists of the following 10 boundary points: Start at 448417, 2432669; 449275, 2432700; 449659, 2430034; 449241, 2429178; 447613, 2429349; 447532, 2429359; 447101, 2429410; 446996, 2430939; 448515, 2432105; 448503, 2432172; return to starting point.

(B) Note: Map 53 follows:

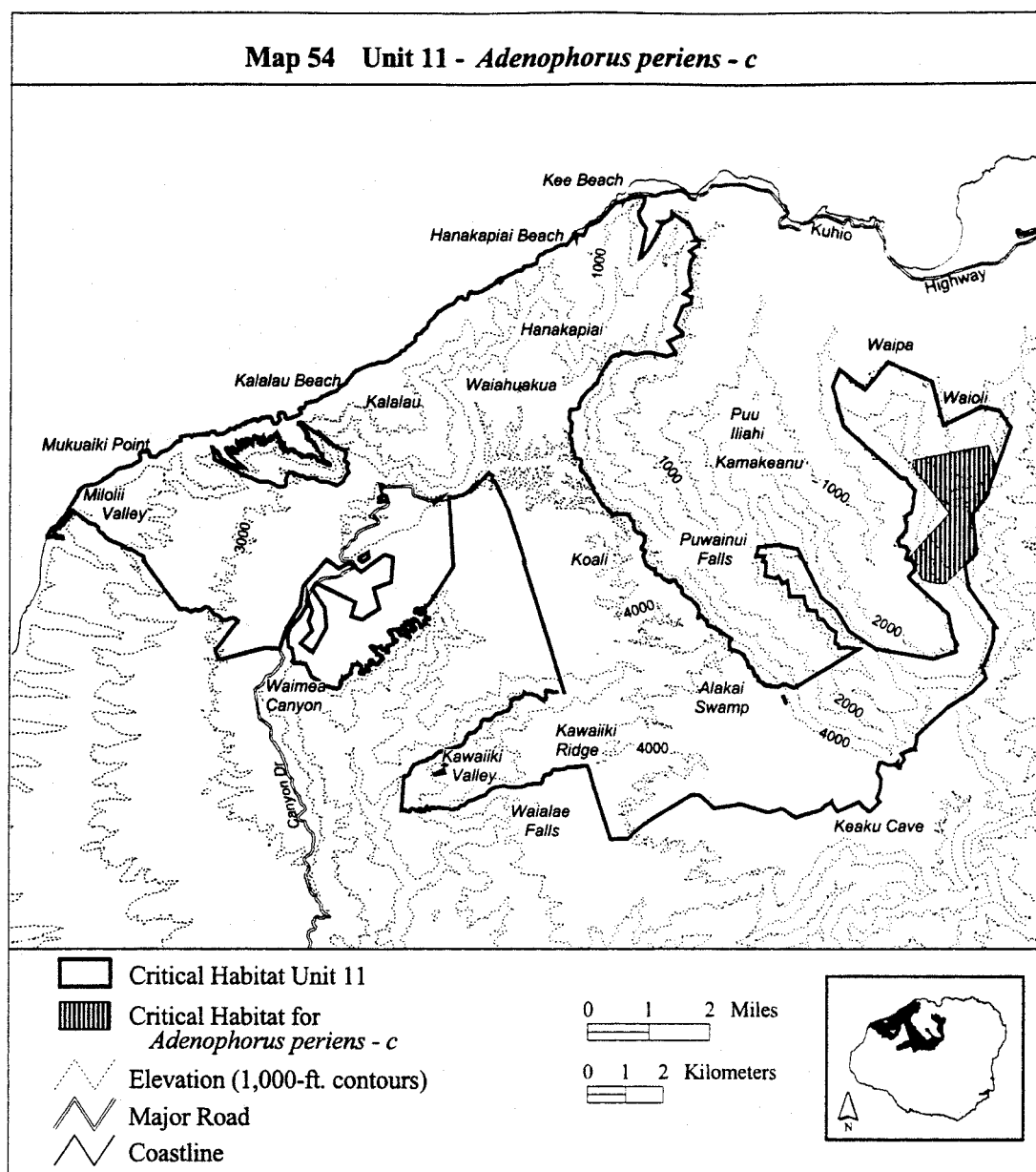


(liv) Kauai 11—*Adenophorus periens*—c (469 ha; 1,158 ac)

(A) Unit consists of the following 14 boundary points: Start at 449704, 2450172; 449432, 2449395; 449073, 2448923; 449147, 2447868; 448881, 2447609; 448393, 2447136; 448172, 2447124; 447753, 2447224; 447428, 2447829; 448470, 2448968; 447485, 2450219; 447507, 2450366; 449486,

2450747; 449649, 2450316; return to starting point.

(B) Note: Map 54 follows:



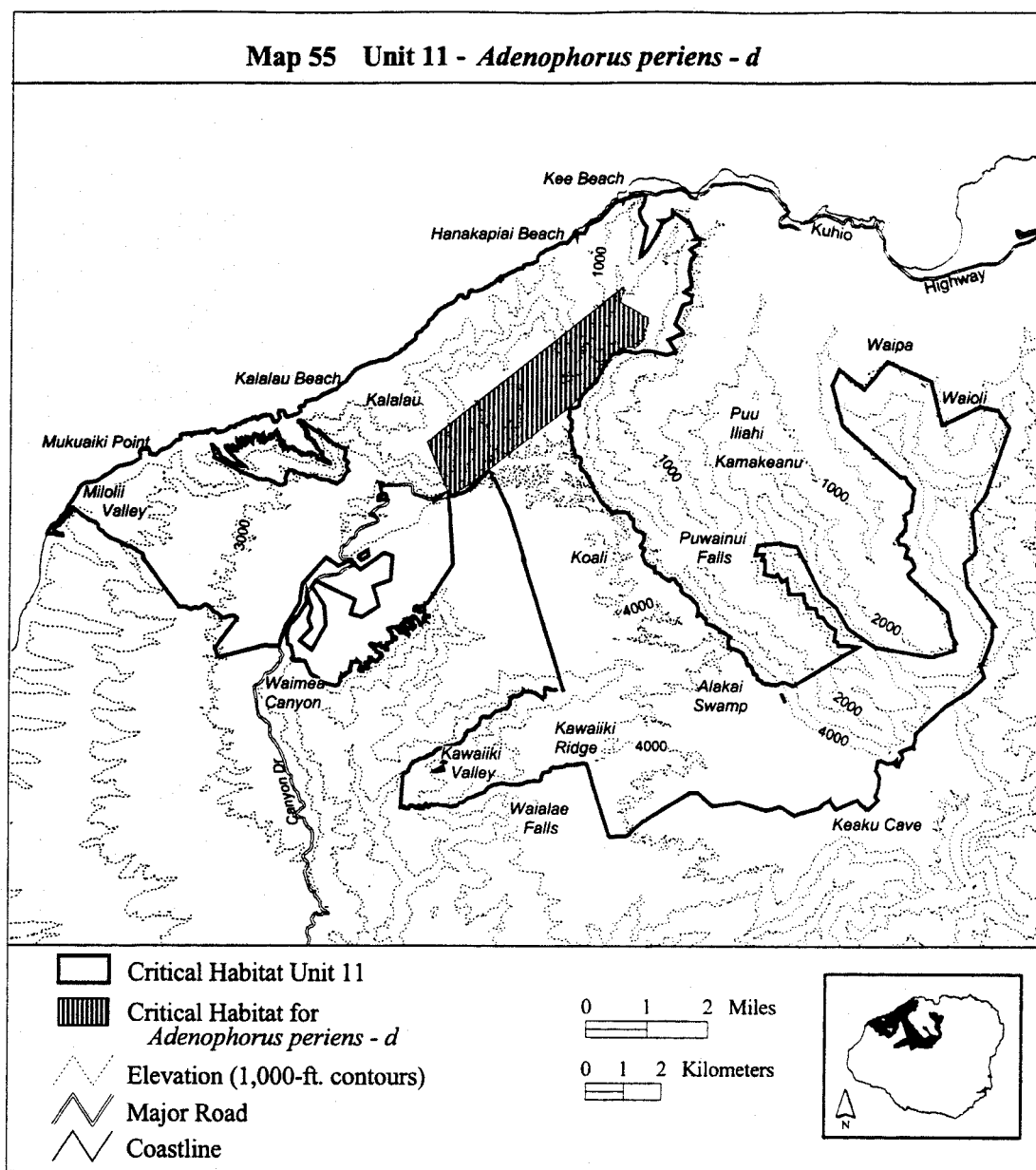
(lv) Kauai 11—*Adenophorus periens*—d
(1,006 ha; 2,485 ac)

(A) Unit consists of the following 82 boundary points: Start at 439347, 2452789; 439324, 2452794; 439098, 2452402; 438924, 2452225; 438478, 2451772; 438422, 2451715; 438390, 2451682; 436328, 2450087; 436296, 2450046; 436244, 2450016; 436213, 2450009; 436203, 2450009; 436111, 2449924; 436104, 2449902; 436086, 2449869; 436075, 2449855; 436058, 2449842; 436017, 2449817; 436001, 2449805; 435988, 2449789; 435985, 2449783; 435308, 2449368; 435292,

2449379; 435269, 2449384; 435247, 2449385; 434652, 2450774; 434814, 2450917; 434829, 2450928; 435956, 2451815; 438144, 2453533; 438500, 2453813; 439711, 2454765; 439738, 2454786; 439842, 2454868; 439760, 2454456; 440303, 2454155; 440294, 2454127; 440436, 2454081; 440496, 2454047; 440485, 2453995; 440492, 2453950; 440484, 2453922; 440461, 2453865; 440450, 2453851; 440432, 2453815; 440421, 2453780; 440412, 2453745; 440410, 2453716; 440404, 2453694; 440384, 2453655; 440378, 2453623; 440380, 2453590; 440370, 2453517; 440363, 2453496; 440355,

2453461; 440350, 2453451; 440333, 2453428; 440315, 2453408; 440288, 2453388; 440275, 2453381; 440244, 2453334; 440223, 2453322; 440199, 2453305; 440147, 2453289; 440119, 2453282; 440093, 2453280; 439987, 2453284; 439962, 2453283; 439924, 2453275; 439905, 2453264; 439787, 2453162; 439724, 2453135; 439639, 2453119; 439600, 2453107; 439553, 2453082; 439503, 2453046; 439481, 2453022; 439473, 2452985; 439464, 2452963; 439414, 2452909; 439390, 2452876; 439355, 2452801; return to starting point.

(B) Note: Map 55 follows:



(lvi) Kauai 11—*Alectryon macrococcus*—a (382 ha; 943 ac)

(A) Unit consists of the following 292 boundary points: Start at 435336,

2442801; 435344, 2442802; 435367, 2442807; 435391, 2442814; 435415, 2442819; 435435, 2442826; 435454, 2442831; 435476, 2442838; 435496, 2442844; 435516, 2442850; 435530, 2442853; 435534, 2442855; 435543, 2442858; 435556, 2442862; 435571, 2442867; 435585, 2442876; 435596, 2442883; 435624, 2442882; 435632, 2442910; 435642, 2442920; 435658, 2442932; 435668, 2442948; 435673, 2442959; 435681, 2442977; 435688, 2442995; 435693, 2443006; 435698, 2443024; 435704, 2443036; 435708, 2443047; 435715, 2443064; 435722,

2443078; 435725, 2443086; 435729, 2443093; 435735, 2443103; 435738, 2443112; 435743, 2443127; 435749, 2443138; 435753, 2443149; 435757, 2443155; 435766, 2443169; 435778, 2443179; 435790, 2443186; 435804, 2443188; 435821, 2443194; 435842, 2443199; 435861, 2443202; 435874, 2443204; 435889, 2443208; 435904, 2443211; 435933, 2443223; 435942, 2443232; 435949, 2443246; 435958, 2443255; 435969, 2443263; 435979, 2443271; 435993, 2443281; 436010, 2443297; 436032, 2443316; 436048, 2443332; 436064, 2443343; 436080, 2443358; 436089, 2443375; 436095, 2443390; 436100, 2443403; 436107, 2443421; 436113, 2443456; 436118, 2443477; 436123, 2443502; 436134, 2443520; 436146, 2443534; 436160,

2443543; 436175, 2443554; 436190, 2443560; 436213, 2443563; 436227, 2443563; 436240, 2443562; 436254, 2443557; 436265, 2443552; 436274, 2443547; 436287, 2443540; 436300, 2443537; 436315, 2443532; 436328, 2443529; 436337, 2443528; 436348, 2443531; 436357, 2443536; 436369, 2443546; 436380, 2443558; 436392, 2443572; 436403, 2443585; 436421, 2443611; 436438, 2443631; 436460, 2443655; 436478, 2443676; 436497, 2443688; 436518, 2443696; 436534, 2443700; 436558, 2443707; 436576, 2443711; 436597, 2443714; 436611, 2443716; 436630, 2443718; 436644, 2443720; 436655, 2443724; 436666, 2443731; 436678, 2443742; 436697, 2443756; 436708, 2443763; 436726, 2443769; 436745, 2443772; 436758,

2443775; 436771, 2443776; 436788, 2443776; 436799, 2443778; 436808, 2443781; 436818, 2443785; 436823, 2443786; 436829, 2443790; 436837, 2443797; 436841, 2443801; 436845, 2443807; 436852, 2443819; 436861, 2443831; 436870, 2443847; 436882, 2443863; 436890, 2443877; 436900, 2443900; 436911, 2443923; 436914, 2443936; 436914, 2443948; 436913, 2443962; 436910, 2443981; 436908, 2443995; 436908, 2443995; 436943, 2444066; 436951, 2444073; 436961, 2444084; 436969, 2444094; 436975, 2444098; 436983, 2444102; 436994, 2444107; 437009, 2444108; 437026, 2444105; 437049, 2444100; 437067, 2444092; 437076, 2444089; 437106, 2444090; 437119, 2444096; 437128, 2444104; 437129, 2444107; 437182, 2444088; 437303, 2444229; 437310, 2444225; 437332, 2444217; 437351, 2444217; 437365, 2444221; 437566, 2444182; 437578, 2444179; 437593, 2444170; 437610, 2444160; 437624, 2444146; 437636, 2444132; 437651, 2444119; 437671, 2444112; 437691, 2444102; 437703, 2444093; 437722, 2444082; 437732, 2444069; 437749, 2444061; 437758, 2444058; 437768, 2444060; 437780, 2444066; 437810, 2444080; 437821, 2444088; 437831, 2444100; 437833, 2444111; 437835, 2444126; 437833, 2444139; 437827, 2444163; 437822, 2444185; 437820,

2444206; 437818, 2444236; 437824, 2444265; 437828, 2444292; 437836, 2444314; 437843, 2444322; 437854, 2444327; 437871, 2444328; 437887, 2444323; 437909, 2444314; 437933, 2444302; 437960, 2444289; 437984, 2444274; 438007, 2444260; 438028, 2444258; 438048, 2444258; 438072, 2444260; 438087, 2444266; 438109, 2444271; 438133, 2444273; 438164, 2444270; 438196, 2444263; 438335, 2444214; 438238, 2444515; 438251, 2444591; 438333, 2444564; 438464, 2444701; 438540, 2444598; 438837, 2444584; 438878, 2444453; 438982, 2444481; 439071, 2444639; 439712, 2444756; 439712, 2444935; 439774, 2444949; 439816, 2444749; 439747, 2444687; 439395, 2444474; 439271, 2444301; 438988, 2444026; 438609, 2444178; 438554, 2444019; 438154, 2443806; 438037, 2443916; 437368, 2443785; 437354, 2443668; 437354, 2443516; 437203, 2443323; 436548, 2443254; 436617, 2443027; 436224, 2442848; 436210, 2442751; 436637, 2442799; 436982, 2442606; 436644, 2442510; 437023, 2442303; 436989, 2442144; 437223, 2442103; 436975, 2442027; 436975, 2441958; 436803, 2441986; 436734, 2442110; 436672, 2442034; 436623, 2442034; 436389, 2442076; 436375, 2441993; 436175, 2441965; 436072, 2442041; 435879, 2441972; 435617, 2441890; 435810,

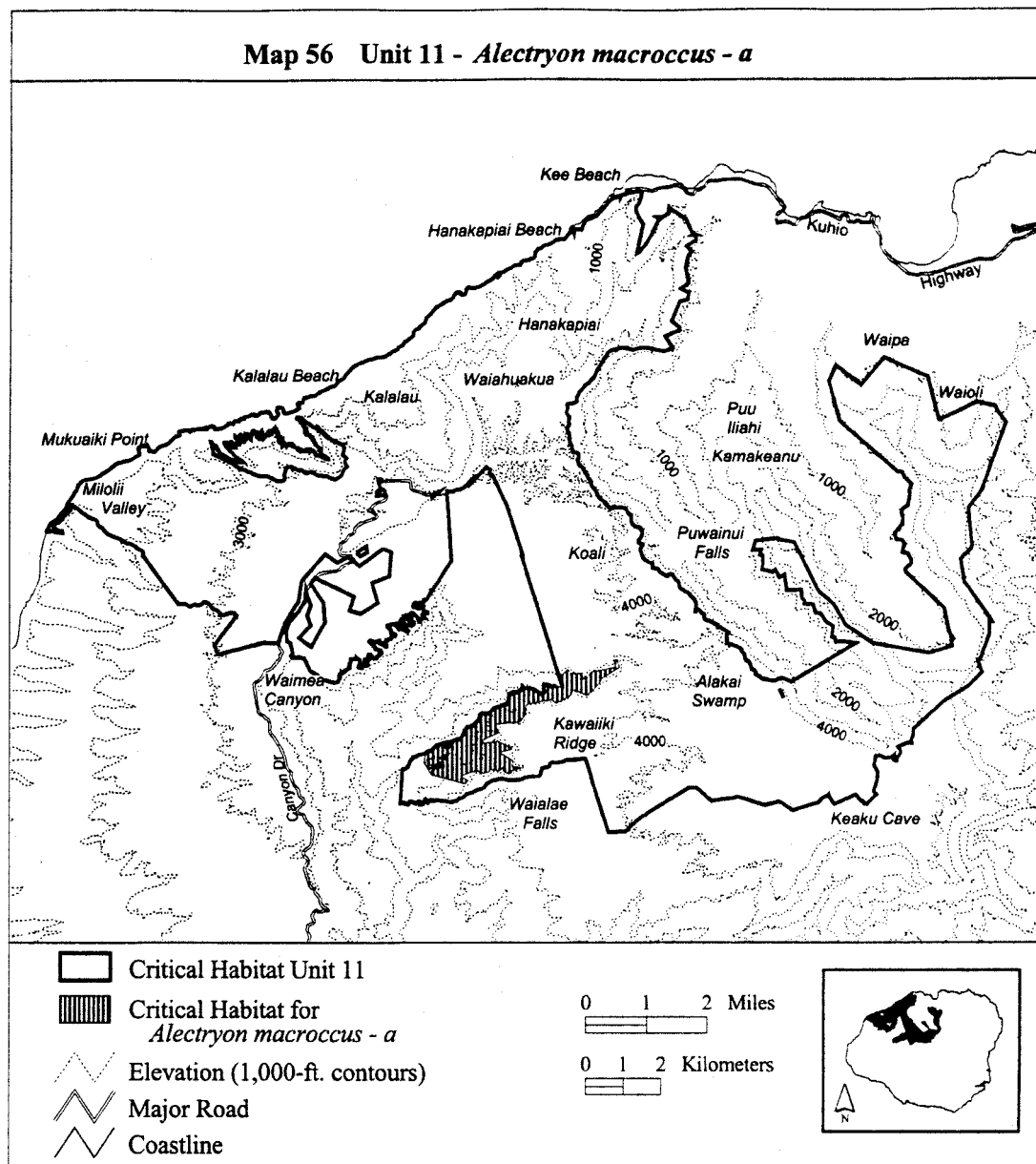
2441766; 435755, 2441683; 434852, 2441917; 434645, 2442255; 434684, 2442495; 434700, 2442502; 434713, 2442515; 434725, 2442524; 434735, 2442532; 434755, 2442542; 434775, 2442551; 434800, 2442556; 434822, 2442562; 434842, 2442574; 434862, 2442596; 434883, 2442613; 434896, 2442626; 434916, 2442647; 434934, 2442668; 434949, 2442681; 434972, 2442699; 434986, 2442705; 434997, 2442708; 435006, 2442713; 435012, 2442717; 435026, 2442719; 435039, 2442722; 435061, 2442727; 435081, 2442733; 435100, 2442739; 435119, 2442747; 435135, 2442754; 435150, 2442764; 435164, 2442771; 435184, 2442774; 435201, 2442777; 435219, 2442778; 435237, 2442782; 435251, 2442783; 435228, 2442762; 435237, 2442643; 435284, 2442631; return to starting point.

(B) Excluding 2 areas:

(1) Bounded by the following 3 points (1 ha; 3 ac): Start at 435132, 2442248; 435160, 2442164; 434848, 2442098; return to starting point; and

(2) Bounded by the following 4 points: (0 ha; 1 ac): Start at 435151, 2442425; 435215, 2442393; 435195, 2442353; 435128, 2442379; return to starting point.

(C) **Note:** Map 56 follows:



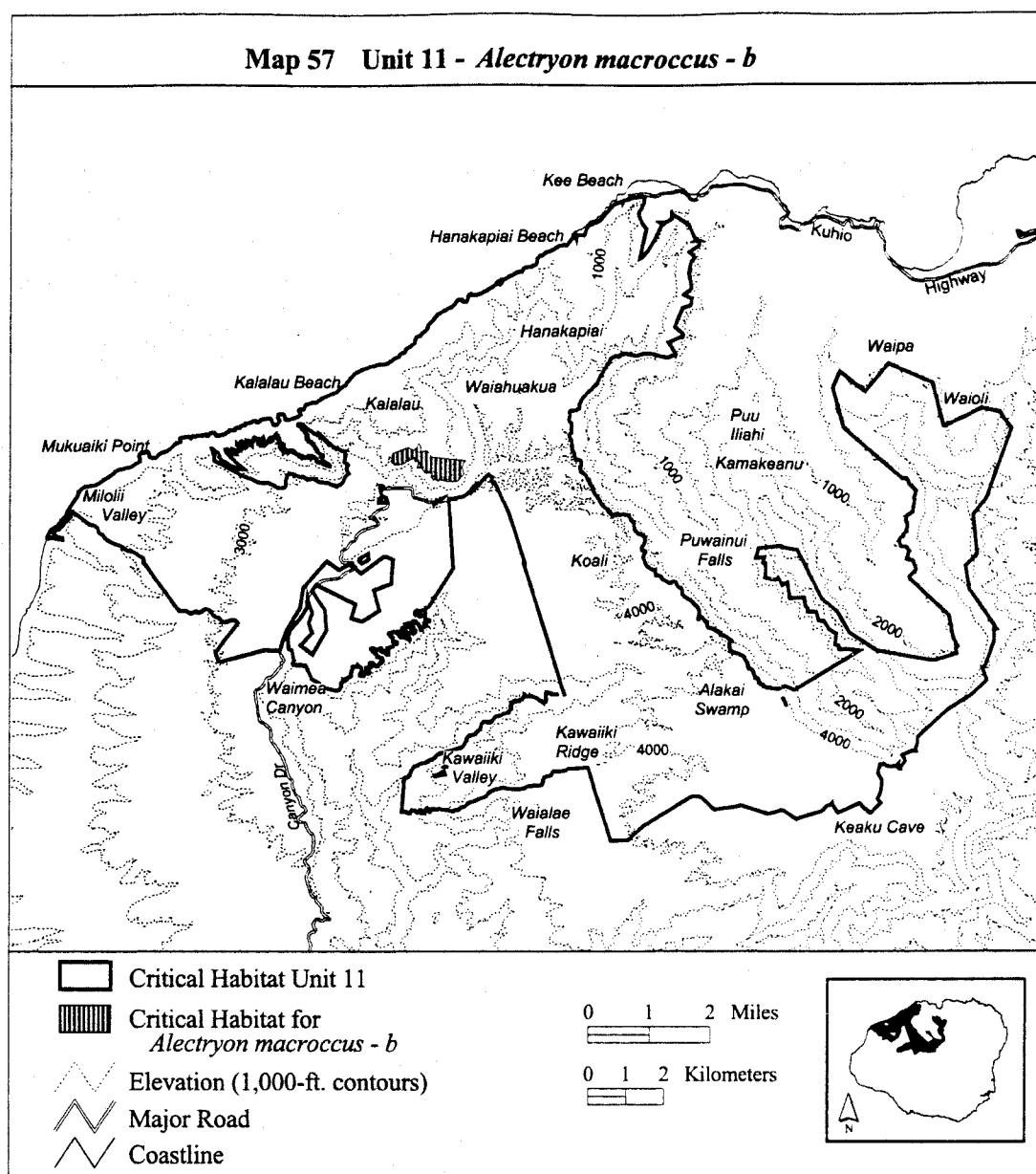
(lvii) Kauai 11—*Alectryon macroccus*—b (90 ha; 222 ac)

(A) Unit consists of the following 42 boundary points: Start at 434114, 2450720; 434166, 2450751; 434206, 2450682; 434246, 2450687; 434293, 2450650; 434374, 2450717; 434437, 2450858; 434504, 2450749; 434475, 2450619; 434648, 2450659; 434778,

2450484; 435695, 2450389; 435608, 2450327; 435588, 2450199; 435632, 2450023; 435535, 2449928; 435447, 2449835; 435182, 2449829; 435011, 2449895; 434939, 2449841; 434894, 2449891; 434816, 2449871; 434773, 2449947; 434755, 2449958; 434787, 2450016; 434784, 2450052; 434742, 2450070; 434609, 2450052; 434578,

2450109; 434543, 2450151; 434504, 2450195; 434399, 2450200; 434430, 2450325; 434417, 2450370; 434363, 2450363; 434331, 2450386; 434320, 2450475; 434145, 2450379; 433991, 2450281; 433804, 2450277; 433704, 2450352; 433744, 2450570; return to starting point.

(B) **Note:** Map 57 follows:



(lviii) Kauai 11—*Alsinidendron lychnoides*—a (993 ha; 2,455 ac)

(A) Unit consists of the following 192 boundary points: Start at 439360, 2452812; 439283, 2452730; 439242, 2452604; 439217, 2452559; 439144, 2452406; 439128, 2452379; 439125, 2452373; 439120, 2452368; 439061, 2452327; 439037, 2452297; 439020, 2452266; 438997, 2452241; 438936, 2452213; 438888, 2452163; 438833, 2452090; 438761, 2452013; 438715, 2451908; 438680, 2451858; 438680, 2451783; 438675, 2451766; 438670, 2451754; 438657, 2451738; 438599, 2451708; 438529, 2451692; 438484, 2451690; 438442, 2451682; 438429, 2451670; 438425, 2451652; 438440, 2451600; 438435, 2451571; 438419,

2451509; 438410, 2451464; 438422, 2451414; 438454, 2451380; 438478, 2451359; 438485, 2451346; 438481, 2451287; 438472, 2451261; 438467, 2451228; 438472, 2451209; 438481, 2451188; 438486, 2451163; 438484, 2451141; 438475, 2451113; 438455, 2451089; 438434, 2451069; 438425, 2451047; 438435, 2450985; 438427, 2450964; 438472, 2450910; 438501, 2450796; 438488, 2450686; 438554, 2450559; 438576, 2450448; 438571, 2450438; 438578, 2450438; 438581, 2450423; 438621, 2450415; 438690, 2450392; 438715, 2450373; 438731, 2450342; 438736, 2450325; 438737, 2450311; 438732, 2450286; 438717, 2450241; 438713, 2450206; 438716, 2450162; 438717, 2450158; 438658, 2450128; 438536, 2450165; 438407,

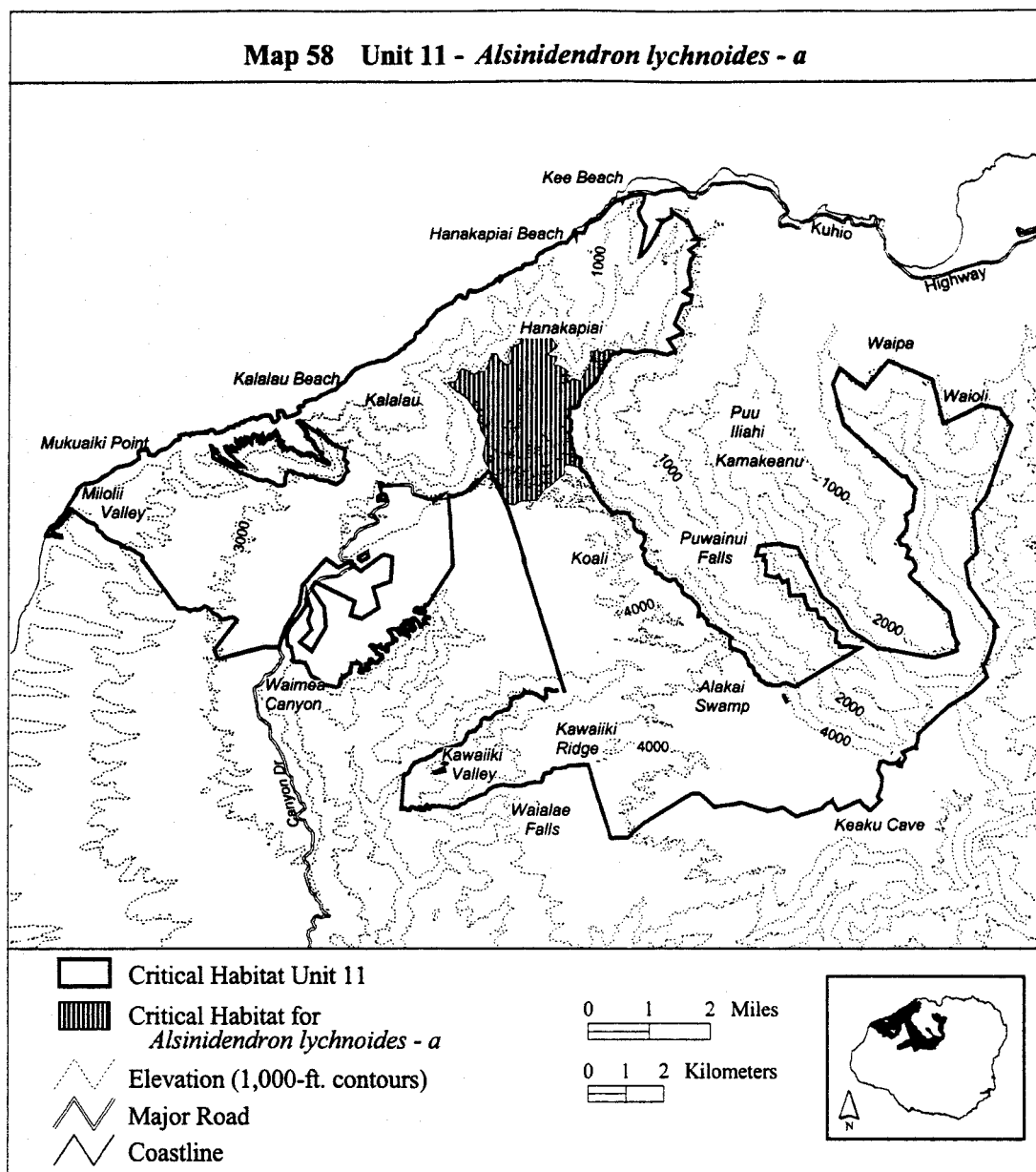
2450217; 438314, 2450210; 438311, 2450196; 438281, 2450069; 438277, 2449915; 438166, 2449844; 438107, 2449793; 437960, 2449667; 437875, 2449601; 437812, 2449579; 437668, 2449383; 437627, 2449302; 437550, 2449262; 437413, 2449247; 437247, 2449258; 437125, 2449214; 436955, 2449122; 436770, 2449170; 436737, 2449184; 436566, 2449559; 436578, 2449579; 436604, 2449675; 436575, 2449727; 436490, 2449760; 436423, 2449793; 436375, 2449838; 436375, 2449882; 436386, 2449952; 436334, 2449989; 436253, 2450044; 436310, 2450116; 436170, 2450294; 436132, 2450455; 436191, 2450690; 436218, 2450861; 436154, 2451005; 436084, 2451096; 436071, 2451235; 435999, 2451347; 436020, 2451545; 435900,

2451671; 435731, 2451919; 435437,
2452127; 435277, 2452266; 435202,
2452357; 435383, 2452379; 435442,
2452416; 435523, 2452667; 435587,
2452715; 435731, 2452662; 435859,
2452597; 435945, 2452592; 436009,
2452651; 436175, 2452641; 436293,
2452859; 436368, 2453095; 436491,
2453121; 436571, 2452971; 436699,
2452864; 436801, 2452816; 436876,
2452886; 436795, 2453040; 436902,
2453276; 437116, 2453404; 437116,
2453510; 437234, 2453580; 437239,
2453681; 437346, 2453810; 437426,
2453991; 437640, 2454012; 437710,

2453996; 437678, 2453943; 437635,
2453900; 437742, 2453809; 437849,
2453788; 437929, 2453799; 437993,
2453676; 437983, 2453510; 438004,
2453441; 438116, 2453323; 438079,
2453254; 437956, 2453184; 437844,
2453099; 437988, 2453045; 438100,
2453045; 438082, 2452951; 438047,
2452880; 438009, 2452858; 438009,
2452826; 438172, 2452798; 438248,
2452739; 438336, 2452682; 438357,
2452597; 438378, 2452559; 438453,
2452532; 438373, 2452458; 438368,
2452410; 438368, 2452361; 438512,
2452447; 438603, 2452442; 438705,

2452399; 438844, 2452644; 438928,
2452744; 439013, 2452928; 438986,
2453175; 439084, 2453179; 439154,
2453195; 439272, 2453141; 439389,
2453216; 439491, 2453221; 439576,
2453193; 439635, 2453173; 439658,
2453123; 439639, 2453119; 439600,
2453107; 439553, 2453082; 439503,
2453046; 439481, 2453022; 439473,
2452985; 439464, 2452963; 439414,
2452909; 439390, 2452876; return to
starting point.

(B) Note: Map 58 follows:



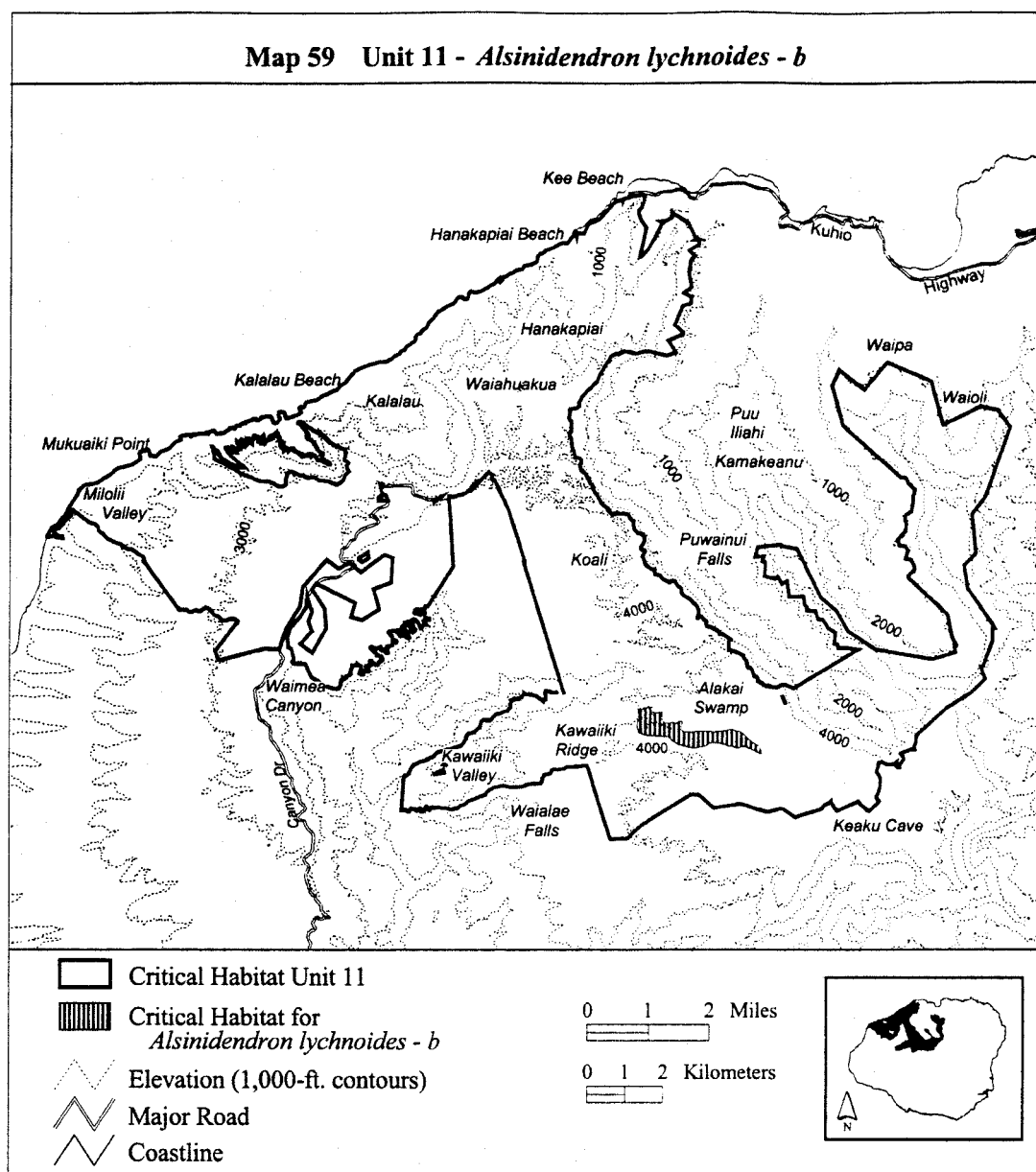
(lix) Kauai 11—*Alsinidendron lychnoides*—b (138 ha; 340 ac)

(A) Unit consists of the following 69 boundary points: Start at 442522, 2443254; 442609, 2443267; 442692, 2443312; 442829, 2443300; 442867, 2443258; 442962, 2443258; 443104, 2443163; 443187, 2443067; 443307, 2442972; 443473, 2442880; 443531, 2442768; 443548, 2442664; 443133, 2442864; 443045, 2442860; 442933, 2442822; 442746, 2442880; 442717, 2442860; 442622, 2442897; 442605,

2442901; 442522, 2442930; 442414, 2442951; 442265, 2442959; 442182, 2442935; 442099, 2442876; 441804, 2442823; 441629, 2442831; 441355, 2442906; 441177, 2443010; 441098, 2443101; 440998, 2443113; 440811, 2443118; 440487, 2443134; 440400, 2443172; 440350, 2443202; 440371, 2443201; 440305, 2443230; 440350, 2443202; 440309, 2443205; 440251, 2443371; 440271, 2443487; 440309, 2443591; 440300, 2443720; 440275, 2443832; 440346, 2443811; 440496, 2443865; 440579, 2443877; 440616,

2443852; 440633, 2443769; 440753, 2443736; 440923, 2443749; 440919, 2443678; 440919, 2443541; 440994, 2443479; 441127, 2443466; 441181, 2443487; 441280, 2443462; 441393, 2443516; 441451, 2443508; 441434, 2443437; 441417, 2443358; 441417, 2443288; 441488, 2443242; 441679, 2443229; 441775, 2443242; 441908, 2443263; 442020, 2443258; 442153, 2443263; 442298, 2443225; 442373, 2443262; return to starting point.

(B) Note: Map 59 follows:



(lx) Kauai 11—*Alsinidendron lychnoides*—c (55 ha; 136 ac)

(A) Unit consists of the following 113 boundary points: Start at 438531,

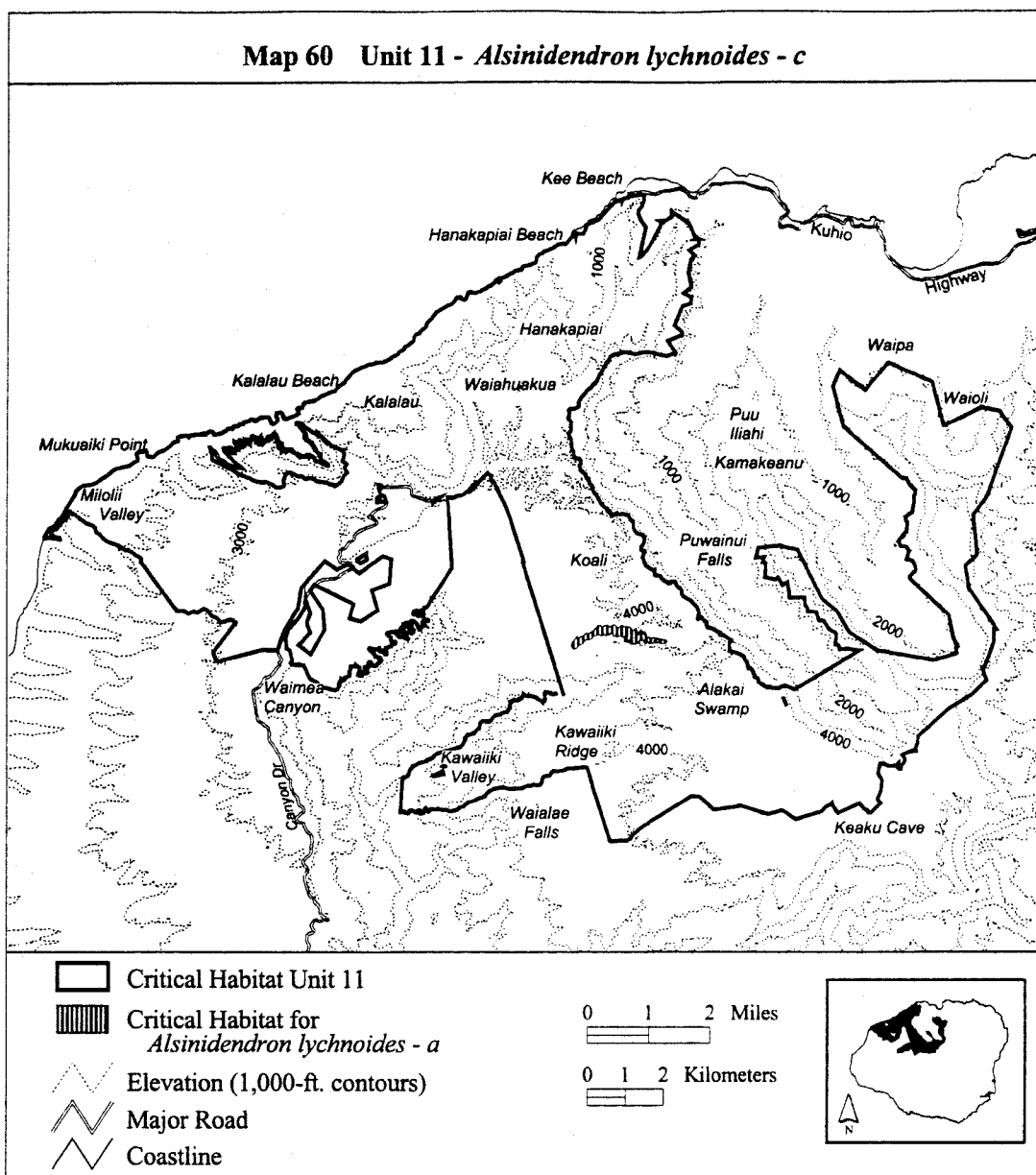
2445488; 438506, 2445513; 438506, 2445542; 438552, 2445621; 438610, 2445684; 438656, 2445758; 438656, 2445742; 438677, 2445713; 438697,

2445708; 438739, 2445721; 438760, 2445758; 438805, 2445779; 438847, 2445791; 438863, 2445825; 438913, 2445854; 438959, 2445820; 439001,

2445936; 440359, 2445882; 440363,
2445849; 440396, 2445857; 440462,
2445870; 440479, 2445791; 440512,
2445749; 440574, 2445716; 440658,
2445716; 440728, 2445729; 440765,
2445708; 440861, 2445683; 440911,
2445683; 441011, 2445670; 441035,
2445621; 440961, 2445579; 440869,
2445571; 440807, 2445604; 440753,
2445587; 440641, 2445571; 440591,
2445588; 440579, 2445612; 440491,
2445621; 440417, 2445608; 440412,
2445646; 440375, 2445671; 440342,
2445662; 440313, 2445633; 440255,
2445583; 440093, 2445567; 440047,
2445592; 440047, 2445654; 439985,
2445625; 439906, 2445621; 439893.

2445642; 439914, 2445696; 439922,
2445762; 439914, 2445779; 439881,
2445733; 439848, 2445758; 439806,
2445791; 439765, 2445754; 439690,
2445754; 439603, 2445779; 439603,
2445824; 439574, 2445849; 439507,
2445808; 439449, 2445787; 439399,
2445791; 439370, 2445837; 439366,
2445812; 439316, 2445775; 439254,
2445800; 439212, 2445808; 439100,
2445771; 439063, 2445700; 438947,
2445663; 438888, 2445663; 438805,
2445563; 438731, 2445542; 438710,
2445538; 438664, 2445459; 438589,
2445434; return to starting point.

(B) **Note:** Map 60 follows:



(lxi) Kauai 11—*Alsinidendron viscosum*—a (736 ha; 1,819 ac)

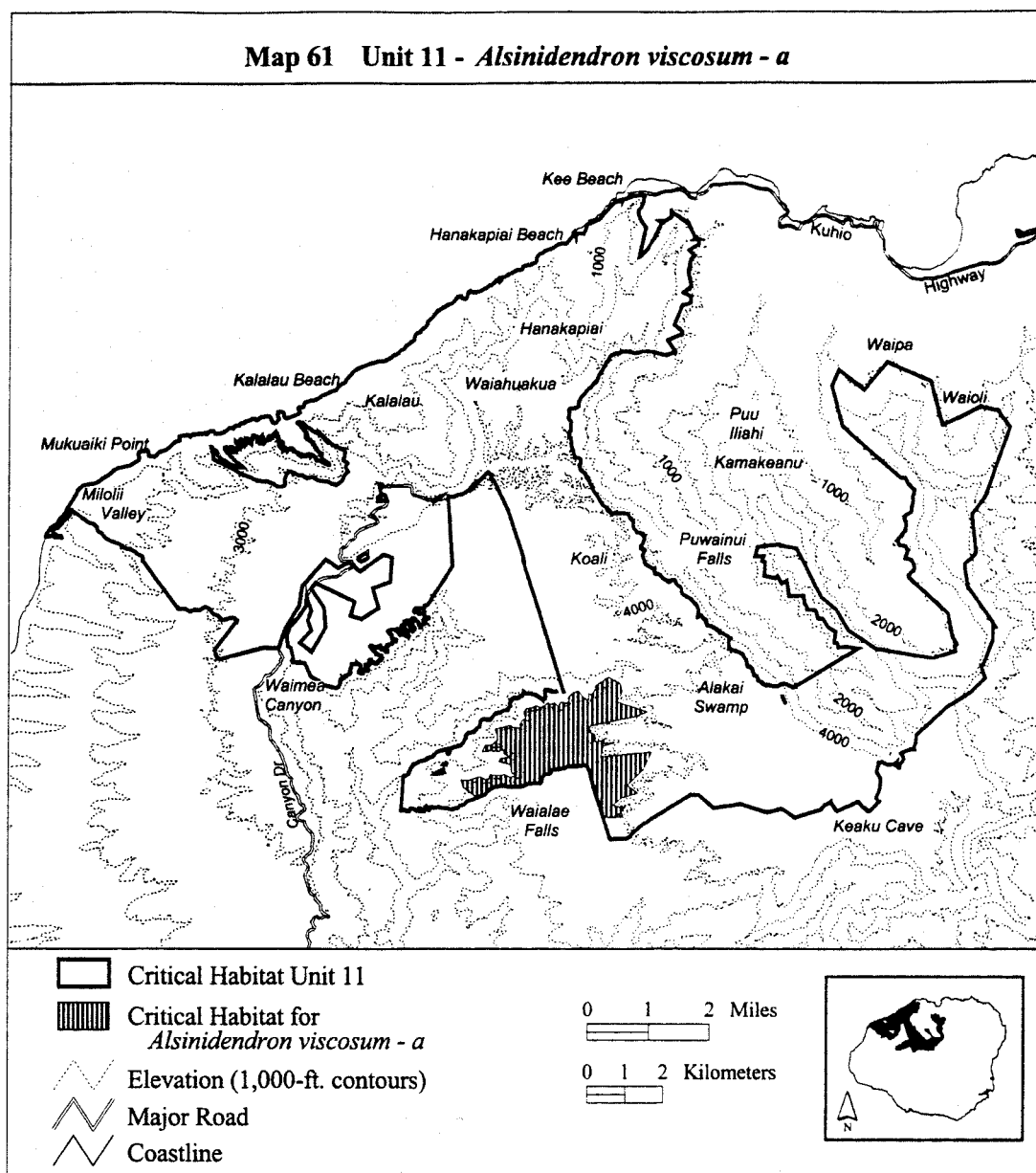
(A) Unit consists of the following 208 boundary points: Start at 439373,

2440983; 438934, 2442351; 438866, 2442347; 438838, 2442340; 438821, 2442339; 438757, 2442331; 438721, 2442329; 438704, 2442326; 438694, 2442327; 438679, 2442324; 438656, 2442321; 438626, 2442315; 438609, 2442314; 438561, 2442316; 438535, 2442314; 438523, 2442310; 438517, 2442310; 438496, 2442310; 438460, 2442320; 438453, 2442321; 438436, 2442321; 438433, 2442319; 438418, 2442311; 438392, 2442294; 438376, 2442278; 438355, 2442265; 438305, 2442256; 438254, 2442248; 438238, 2442248; 438219, 2442244; 438157, 2442234; 438130, 2442234; 438114, 2442232; 438098, 2442237; 438065, 2442246; 438049, 2442246; 438030, 2442243; 438012, 2442229; 438000, 2442216; 437998, 2442205; 437996, 2442188; 437984, 2442167; 437973, 2442147; 437954, 2442136; 437939, 2442128; 437926, 2442125; 437912, 2442123; 437873, 2442121; 437839, 2442110; 437826, 2442106; 437806, 2442092; 437791, 2442074; 437777, 2442052; 437766, 2442017; 437758, 2441998; 437754, 2441991; 437751, 2441981; 437745, 2441950; 437740, 2441938; 437736, 2441928; 437717, 2441899; 437711, 2441887; 437705, 2441878; 437689, 2441877; 437674, 2441875; 437647, 2441866; 437635,

2441866; 437617, 2441866; 437602, 2441867; 437566, 2441876; 437532, 2441880; 437522, 2441879; 437495, 2441869; 437460, 2441862; 437391, 2441858; 437366, 2441852; 437346, 2441845; 437332, 2441842; 437317, 2441835; 437287, 2441816; 437274, 2441809; 437240, 2441796; 437224, 2441791; 437181, 2441781; 437150, 2441777; 437111, 2441777; 437096, 2441779; 437062, 2441776; 437008, 2441775; 436960, 2441776; 436912, 2441780; 436895, 2441784; 436825, 2441795; 436799, 2441801; 436777, 2441809; 436730, 2441820; 436695, 2441811; 436666, 2441808; 436638, 2441803; 436618, 2441796; 436593, 2441792; 436583, 2441789; 436541, 2441785; 436492, 2441773; 436453, 2441759; 436419, 2441739; 436408, 2441737; 436374, 2441718; 436357, 2441708; 436342, 2441700; 436319, 2441681; 436285, 2441639; 436272, 2441618; 436247, 2441590; 436228, 2441575; 436203, 2441564; 436181, 2441558; 436167, 2441552; 436155, 2441546; 436121, 2441536; 436070, 2441515; 436039, 2441504; 436033, 2441502; 435654, 2441777; 435600, 2441959; 435782, 2441952; 436106, 2442053; 436248, 2441979; 436335, 2441979; 436369, 2442121; 436450, 2442100; 436659, 2442080; 436740, 2442121; 436915, 2442033; 437084, 2442087; 436936, 2442161; 436922, 2442363; 436625, 2442458; 436666, 2442525; 436888, 2442559; 436740,

2442647; 436720, 2442755; 436558, 2442714; 436524, 2442748; 436450, 2442707; 436403, 2442761; 436302, 2442714; 436160, 2442701; 436248, 2442883; 436410, 2442883; 436571, 2443011; 436551, 2443078; 436558, 2443159; 436504, 2443294; 436916, 2443395; 437003, 2443335; 437192, 2443314; 437152, 2443409; 437226, 2443523; 437327, 2443564; 437266, 2443705; 437320, 2443827; 437523, 2443847; 437583, 2443901; 437718, 2443833; 437921, 2443989; 437948, 2443935; 438062, 2443982; 438170, 2443867; 438251, 2444002; 438366, 2443955; 438447, 2444009; 438440, 2444117; 438575, 2444231; 438710, 2444285; 438804, 2444143; 438959, 2444042; 438986, 2444211; 439047, 2444184; 439074, 2444224; 439162, 2444325; 439155, 2444400; 439499, 2444649; 439823, 2444453; 439850, 2444238; 439735, 2444008; 440518, 2443732; 440241, 2443624; 439007, 2443361; 438993, 2443220; 439155, 2443132; 439128, 2442977; 439283, 2442970; 439405, 2443051; 439357, 2442916; 439668, 2442943; 439364, 2442849; 439283, 2442552; 440646, 2442700; 440437, 2442248; 440005, 2441810; 440281, 2441608; 439863, 2441513; 439641, 2441304; 439769, 2441257; 439964, 2441257; 439769, 2441055; 439904, 2440980; return to starting point.

(B) **Note:** Map 61 follows:



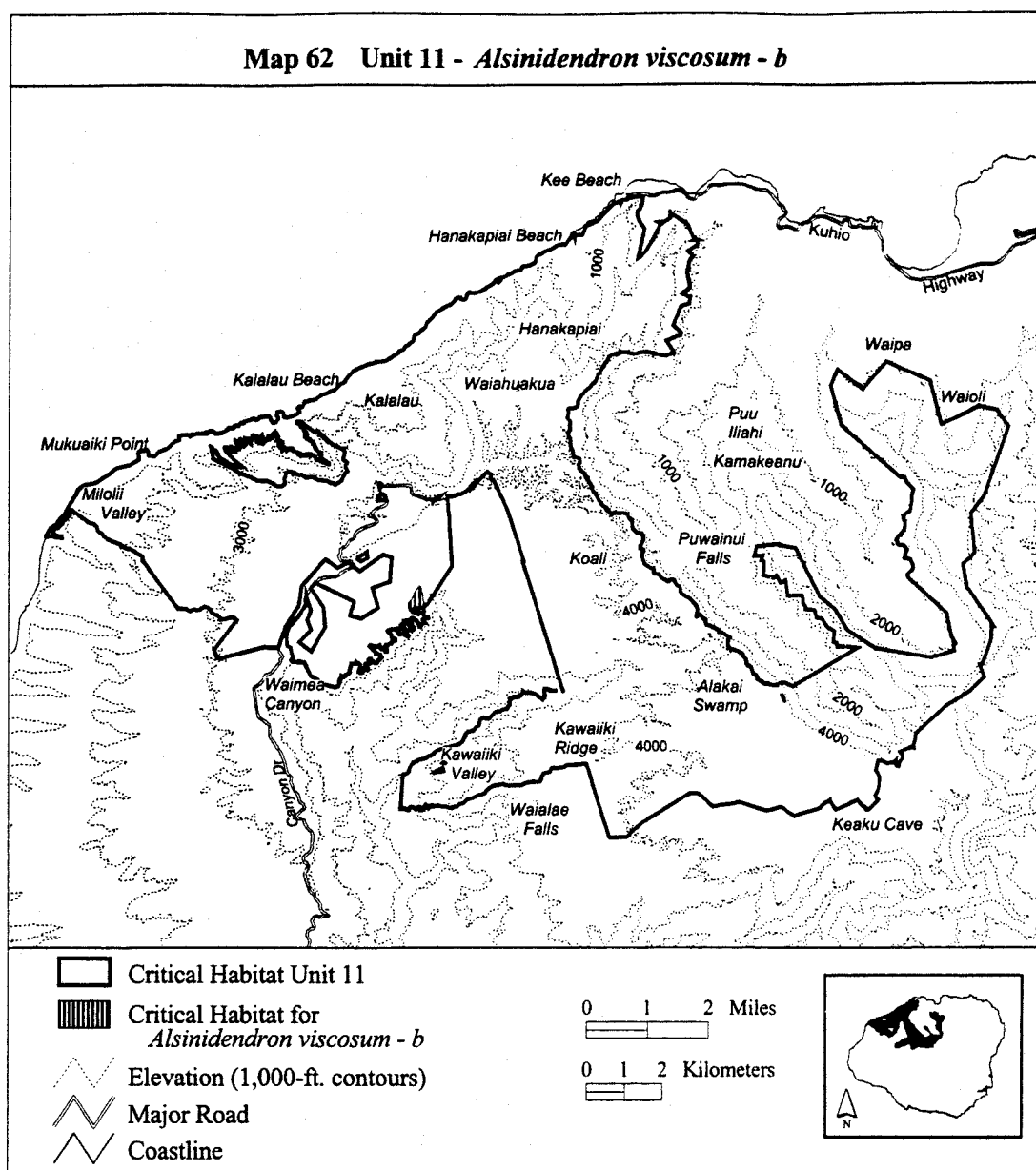
(Ixii) Kauai 11—*Alsinidendron viscosum*—b (17 ha; 42 ac)

(A) Unit consists of the following 106 boundary points: Start at 434696, 2446537; 434683, 2446522; 434681, 2446520; 434675, 2446517; 434668, 2446521; 434668, 2446521; 434668, 2446522; 434668, 2446522; 434668, 2446522; 434668, 2446523; 434668, 2446523; 434668, 2446524; 434668, 2446524; 434668, 2446525; 434668, 2446525; 434668, 2446525; 434668, 2446526; 434652, 2446530; 434615, 2446532; 434610, 2446511; 434615, 2446491; 434606, 2446463; 434569, 2446454; 434550, 2446470; 434504, 2446463; 434476, 2446440; 434460, 2446433; 434442, 2446465; 434423, 2446465; 434391,

2446428; 434366, 2446435; 434338, 2446426; 434320, 2446403; 434320, 2446371; 434336, 2446358; 434340, 2446352; 434353, 2446346; 434357, 2446343; 434387, 2446345; 434407, 2446334; 434435, 2446292; 434481, 2446285; 434479, 2446232; 434377, 2446272; 434294, 2446325; 434230, 2446392; 434193, 2446470; 434195, 2446546; 434211, 2446580; 434287, 2446652; 434320, 2446721; 434377, 2446857; 434453, 2446984; 434516, 2447023; 434534, 2447011; 434555, 2446861; 434573, 2446827; 434571, 2446746; 434587, 2446615; 434631, 2446567; 434684, 2446543; 434684, 2446543; 434684, 2446543; 434685, 2446543; 434685, 2446543; 434685, 2446543; 434686, 2446543; 434686, 2446543; 434686, 2446543; 434687,

2446543; 434687, 2446543; 434687, 2446543; 434688, 2446543; 434688, 2446543; 434689, 2446543; 434689, 2446543; 434690, 2446543; 434690, 2446543; 434690, 2446543; 434691, 2446543; 434691, 2446543; 434692, 2446543; 434692, 2446543; 434692, 2446543; 434693, 2446543; 434693, 2446543; 434694, 2446543; 434694, 2446543; 434695, 2446542; 434695, 2446542; 434695, 2446542; 434696, 2446542; 434696, 2446542; 434697, 2446542; 434697, 2446542; 434697, 2446541; 434698, 2446541; 434698, 2446541; 434698, 2446541; 434699, 2446541; return to starting point.

(B) **Note:** Map 62 follows:



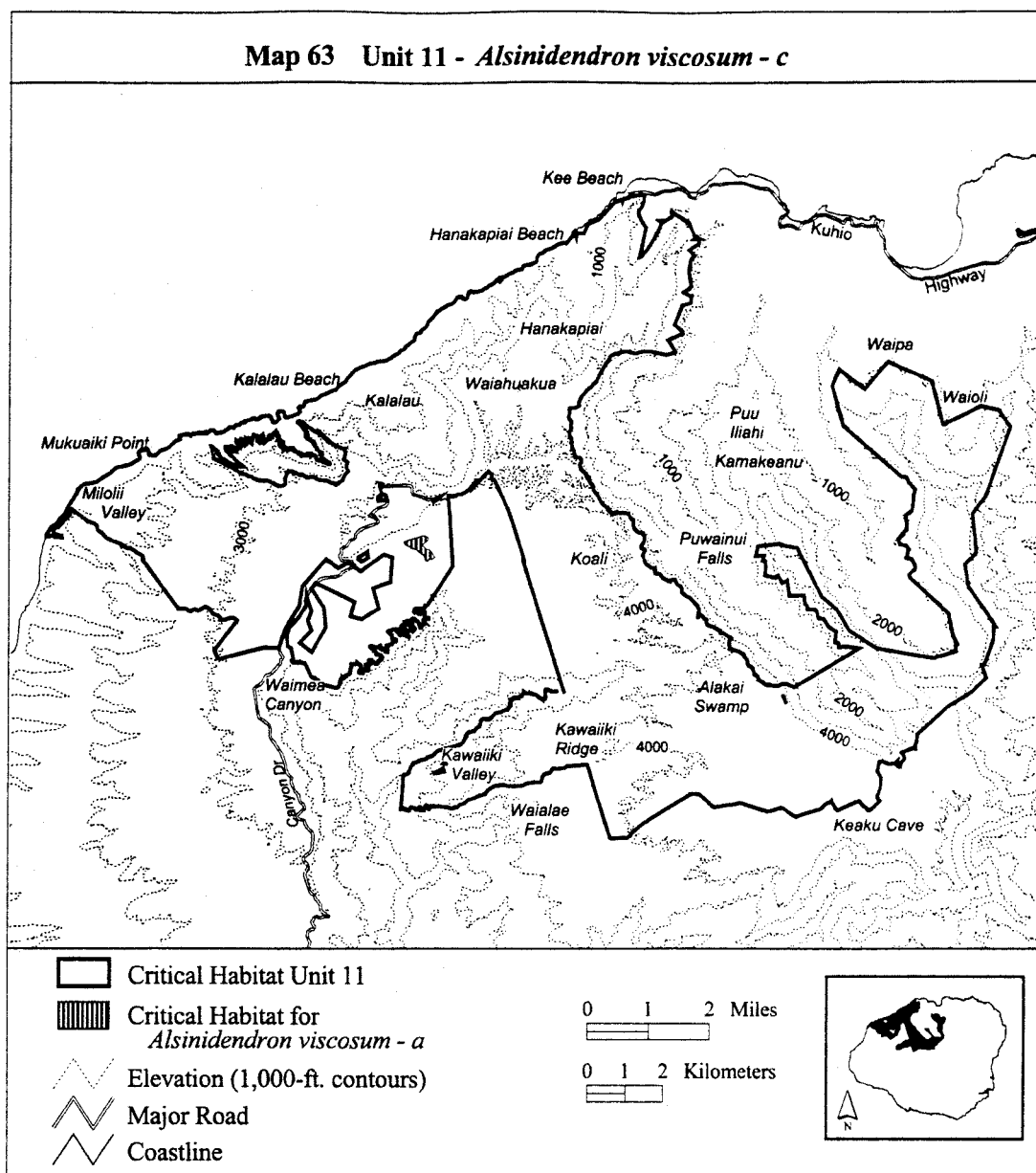
(lxiii) Kauai 11—*Alsinidendron viscosum*—c (22 ha; 55 ac)

(A) Unit consists of the following 27 boundary points: Start at 434055, 2448131; 434055, 2448166; 434207, 2448223; 434407, 2448288; 434564,

2448338; 434672, 2448322; 434718, 2448272; 434714, 2448223; 434679, 2448184; 434610, 2448154; 434550, 2448092; 434580, 2448043; 434656, 2447972; 434725, 2447970; 434765, 2447954; 434880, 2447767; 434825, 2447721; 434767, 2447721; 434714,

2447719; 434716, 2447684; 434672, 2447682; 434626, 2447707; 434610, 2447749; 434612, 2447797; 434400, 2447965; 434283, 2447995; 434151, 2448076; return to starting point.

(B) **Note:** Map 63 follows:



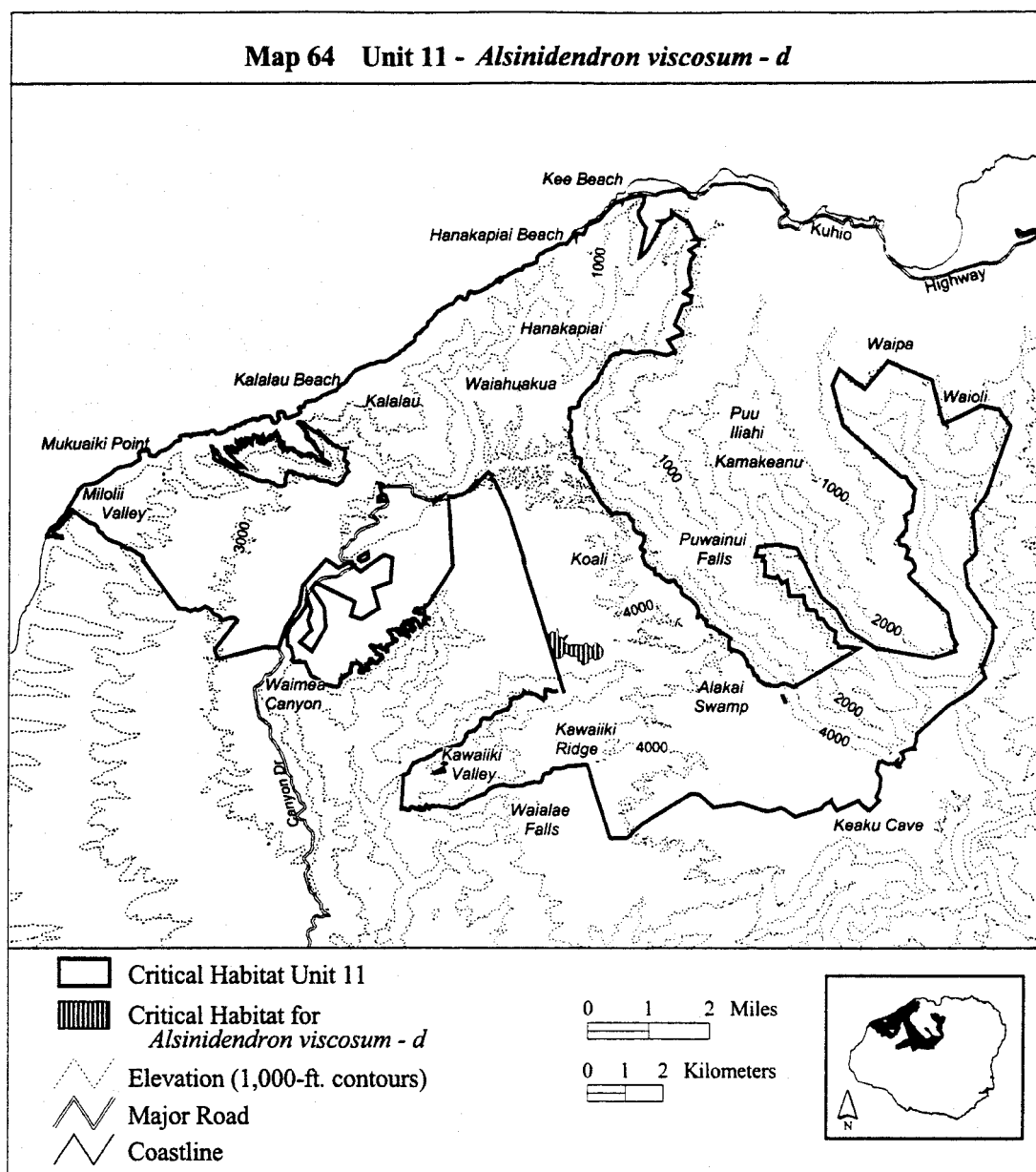
(lxiv) Kauai 11—*Alsinidendron viscosum*—d (61 ha; 150 ac)

(A) Unit consists of the following 63 boundary points: Start at 438024, 2445182; 437858, 2445698; 437863, 2445701; 437907, 2445735; 437930, 2445790; 437989, 2445842; 438041, 2445816; 438078, 2445809; 438112, 2445868; 438115, 2445913; 438130, 2445931; 438175, 2445835; 438156, 2445794; 438152, 2445742; 438193, 2445686; 438275, 2445657; 438297,

2445664; 438375, 2445727; 438401, 2445742; 438401, 2445709; 438368, 2445664; 438312, 2445590; 438312, 2445556; 438353, 2445523; 438464, 2445467; 438546, 2445489; 438609, 2445482; 438732, 2445482; 438814, 2445463; 438892, 2445541; 438929, 2445515; 438981, 2445441; 438999, 2445463; 439066, 2445397; 439137, 2445530; 439200, 2445534; 439330, 2445396; 439352, 2445333; 439333, 2445192; 439274, 2445133; 439192, 2445088; 439125, 2445088; 439085,

2445140; 438996, 2445126; 438970, 2445100; 438962, 2445018; 438921, 2445007; 438825, 2444947; 438784, 2444988; 438762, 2445062; 438713, 2445051; 438680, 2445055; 438680, 2445170; 438602, 2445196; 438535, 2445178; 438476, 2445204; 438431, 2445244; 438364, 2445267; 438286, 2445237; 438268, 2445185; 438219, 2445118; 438141, 2445118; 438030, 2445174; return to starting point.

(B) Note: Map 64 follows:



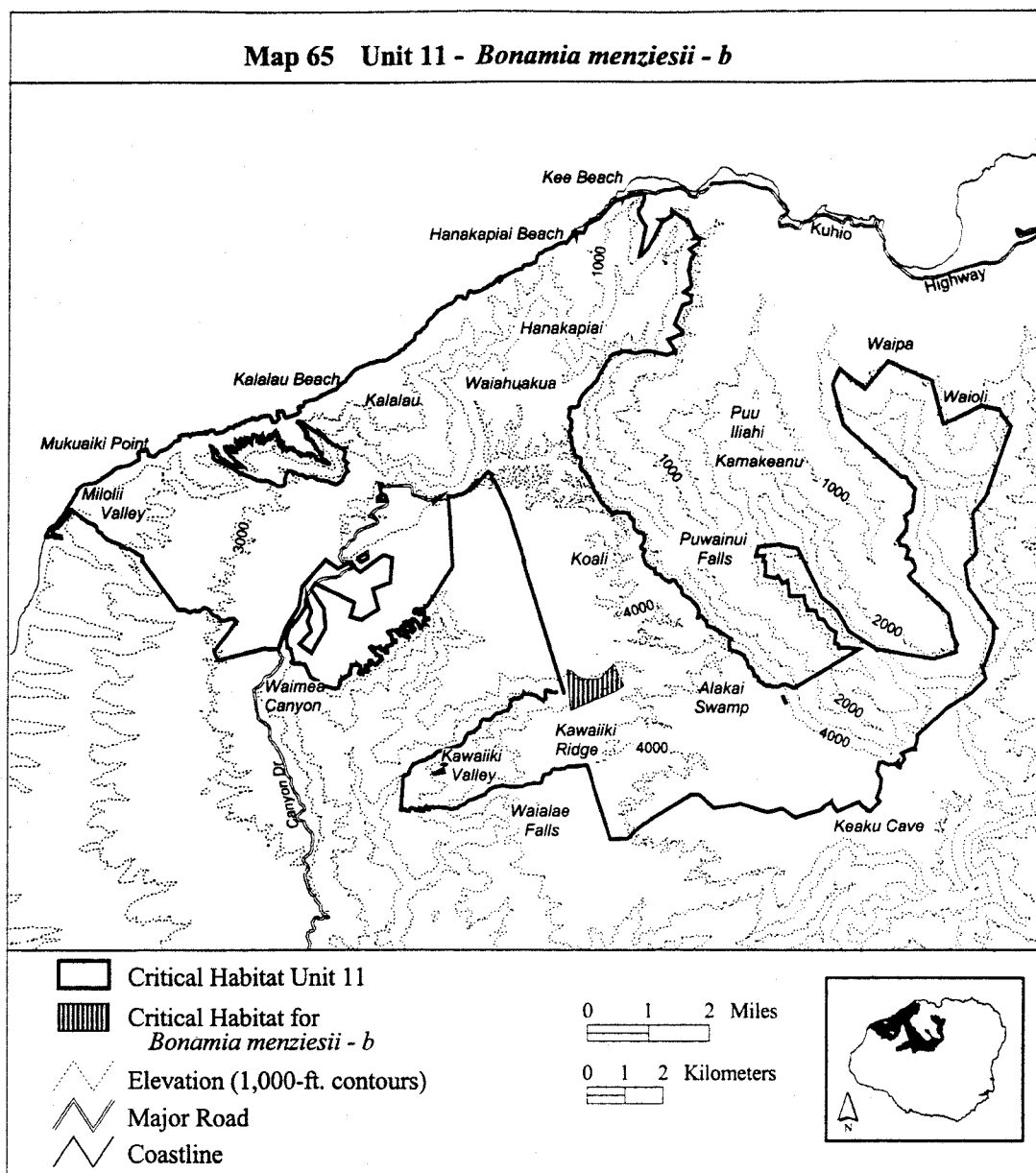
(lxv) Kauai 11—*Bonamia menziesii*—b
(93 ha; 229 ac)

(A) Unit consists of the following 12
boundary points: Start at 438424,

2444853; 438550, 2444811; 438668,
2444697; 438924, 2444597; 439252,
2444612; 439616, 2444997; 439629,
2445010; 439911, 2444437; 439905,

2444434; 439701, 2444298; 438490,
2443789; 438404, 2444823; return to
starting point.

(B) **Note:** Map 65 follows:



(lxvi) Kauai 11—*Brighamia insignis*—c
(1,645 ha; 4,066 ac)

(A) Unit consists of the following 807 boundary points: coastline; 430380, 2450816; 430372, 2450803; 430368, 2450818; 430364, 2450833; 430362, 2450842; 430355, 2450855; 430348, 2450863; 430335, 2450873; 430331, 2450883; 430328, 2450897; 430326, 2450922; 430319, 2450953; 430305, 2450972; 430295, 2450980; 430285, 2450982; 430281, 2450979; 430276, 2450975; 430272, 2450958; 430273, 2450938; 430261, 2450933; 430250, 2450924; 430246, 2450905; 430251, 2450875; 430256, 2450842; 430268, 2450786; 430261, 2450779; 430252, 2450779; 430249, 2450795; 430246, 2450807; 430242, 2450821; 430234,

2450838; 430217, 2450857; 430209, 2450860; 430204, 2450855; 430197, 2450844; 430193, 2450832; 430172, 2450844; 430173, 2450865; 430175, 2450880; 430183, 2450896; 430192, 2450910; 430197, 2450925; 430197, 2450937; 430194, 2450949; 430187, 2450962; 430177, 2450971; 430166, 2450974; 430154, 2450976; 430132, 2450976; 430116, 2450985; 430107, 2450980; 430091, 2450975; 430078, 2450990; 430069, 2450993; 430061, 2450978; 430054, 2450938; 430051, 2450920; 430030, 2450915; 430016, 2450914; 430010, 2450909; 430009, 2450885; 430018, 2450854; 430024, 2450828; 430018, 2450825; 430011, 2450820; 430009, 2450808; 430013, 2450787; 430022, 2450756; 430002, 2450778; 429994, 2450795; 429984,

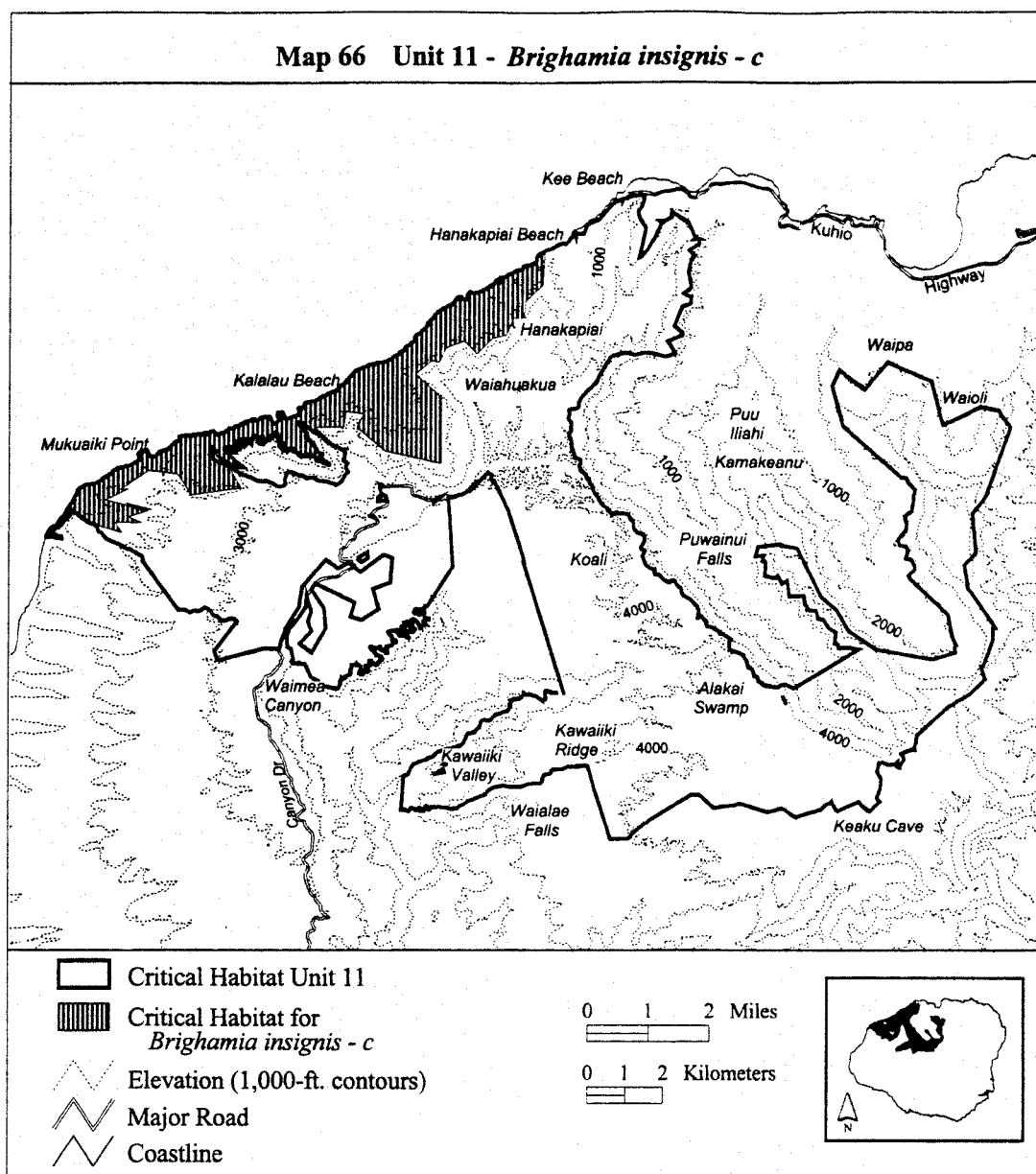
2450820; 429965, 2450849; 429939, 2450888; 429927, 2450906; 429914, 2450914; 429910, 2450911; 429907, 2450899; 429909, 2450889; 429915, 2450875; 429923, 2450865; 429926, 2450848; 429926, 2450827; 429923, 2450820; 429918, 2450819; 429909, 2450824; 429905, 2450835; 429897, 2450849; 429889, 2450860; 429879, 2450871; 429869, 2450875; 429863, 2450868; 429863, 2450852; 429861, 2450836; 429866, 2450814; 429870, 2450799; 429879, 2450785; 429885, 2450774; 429883, 2450763; 429879, 2450756; 429874, 2450750; 429875, 2450744; 429873, 2450736; 429866, 2450746; 429861, 2450753; 429854, 2450754; 429848, 2450756; 429843, 2450769; 429841, 2450785; 429827, 2450802; 429816, 2450819; 429797,

2450845; 429773, 2450868; 429738,
2450896; 429724, 2450899; 429720,
2450887; 429726, 2450875; 429733,
2450856; 429739, 2450832; 429742,
2450813; 429746, 2450791; 429752,
2450769; 429754, 2450756; 429748,
2450755; 429737, 2450753; 429731,
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2450732; 429745, 2450721; 429750,
2450701; 429741, 2450701; 429728,
2450698; 429722, 2450692; 429718,
2450681; 429709, 2450676; 429702,
2450682; 429696, 2450693; 429691,
2450714; 429680, 2450743; 429664,
2450781; 429652, 2450802; 429639,
2450818; 429619, 2450828; 429603,
2450830; 429601, 2450825; 429604,
2450812; 429619, 2450793; 429637,
2450771; 429654, 2450750; 429664,
2450735; 429667, 2450717; 429663,
2450706; 429661, 2450673; 429666,
2450641; 429663, 2450621; 429654,
2450603; 429645, 2450601; 429634,
2450610; 429619, 2450622; 429602,
2450633; 429558, 2450656; 429505,
2450692; 429490, 2450702; 429483,
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2450680; 429489, 2450657; 429496,
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2450553; 429468, 2450566; 429461,
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2450670; 429363, 2450681; 429359,
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2450434; 429500, 2450421; 429523,
2450406; 429541, 2450384; 429554,
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2450324; 429622, 2450305; 429645,

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2450394; 429200, 2450405; 429193,
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2450435; 429161, 2450444; 429158,
2450455; 429152, 2450468; 429143,
2450481; 429128, 2450496; 429115,
2450512; 429114, 2450524; 429113,
2450540; 429110, 2450557; 429103,
2450577; 429091, 2450594; 429077,
2450605; 429060, 2450608; 429041,
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2448872; 425192, 2448867; 425181,
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2448807; 425136, 2448801; 425124,
2448795; 425120, 2448790; 425112,
2448785; 425100, 2448774; 425094,
2448768; 425081, 2448757; 425070,
2448745; 425062, 2448734; 425053,
2448723; 425044, 2448711; 425043,
2448695; 425029, 2448684; 425024,
2448675; 425017, 2448667; 425011,
2448659; 424999, 2448650; 424991,
2448642; 424980, 2448628; 424973,
2448615; 424956, 2448592; 424936,
2448587; 424929, 2448581; 424924,
2448574; 424917, 2448569; 424910,
2448561; 424906, 2448551; 424898,
2448552; 424886, 2448554; 424877,
2448554; 424871, 2448552; 424863,
2448548; 424849, 2448543; 424840,
2448538; 424824, 2448534; 424811,
2448524; 424803, 2448521; 424795,
2448511; 424785, 2448498; 424778,
2448484; 424774, 2448461; 424778,
2448445; 424791, 2448421; 424819,
2448402; 424832, 2448389; 424848,
2448376; 424871, 2448368; 424900,
2448356; 424929, 2448346; 424953,
2448337; 424973, 2448335; 424990,
2448333; 424997, 2448333; 425003,
2448327; 425006, 2448318; 425009,
2448308; 425011, 2448298; 425013,
2448289; 425015, 2448280; 425010,
2448272; 424998, 2448277; 424991,
2448284; 424983, 2448288; 424971,
2448291; 424957, 2448291; 424948,
2448290; 424933, 2448287; 424927,
2448284; 424915, 2448289; 424892,
2448299; 424874, 2448301; 424841,
2448311; 424823, 2448330; 424803,
2448337; 424777, 2448336; 424735,
2448339; 424711, 2448334; 424677,
2448333; 424664, 2448328; 424648,
2448323; 424633, 2448323; 424626,
2448324; 437770, 2455823; coastline.

(B) **Note:** Map 66 follows:



(lxvii) Kauai 11—*Centaurium sebaeoides*—a (157 ha; 389 ac)

(A) Unit consists of the following 146 boundary points: coastline; 427095, 2450498; 427122, 2450315; 427060, 2450219; 426989, 2450139; 426899, 2450102; 426842, 2450083; 426718, 2450054; 426533, 2450045; 426396, 2449902; 426196, 2449751; 426078, 2449627; 425945, 2449585; 425683, 2449570; 425603, 2449523; 425935, 2449124; 425484, 2449385; 425361, 2449167; 425290, 2449017; 425272, 2449039; 425267, 2449033; 425259, 2449024; 425156, 2449046; 438151, 2455997; 438175, 2455951; 437980, 2455838; 437781, 2455767; 437748, 2455684; 437624, 2455686; 437596, 2455530; 437415, 2455416; 437353,

2455428; 437240, 2455402; 437187, 2455293; 437121, 2455312; 436893, 2455212; 436694, 2455108; 436670, 2454975; 436518, 2455013; 436186, 2454752; 435963, 2454705; 435782, 2454719; 435815, 2454383; 435773, 2454345; 435478, 2454572; 435355, 2454397; 435189, 2454316; 435198, 2454193; 435103, 2454269; 435087, 2454279; 435049, 2454273; 434968, 2454196; 434917, 2454149; 434823, 2454030; 434759, 2453950; 434695, 2453852; 434572, 2453716; 434563, 2453601; 434440, 2453605; 434431, 2453507; 434325, 2453410; 434159, 2453307; 434061, 2453235; 433716, 2452967; 433290, 2452789; 433133, 2452729; 433175, 2452661; 433086, 2452542; 433195, 2452368; 432916, 2452476; 432886, 2452378; 432815,

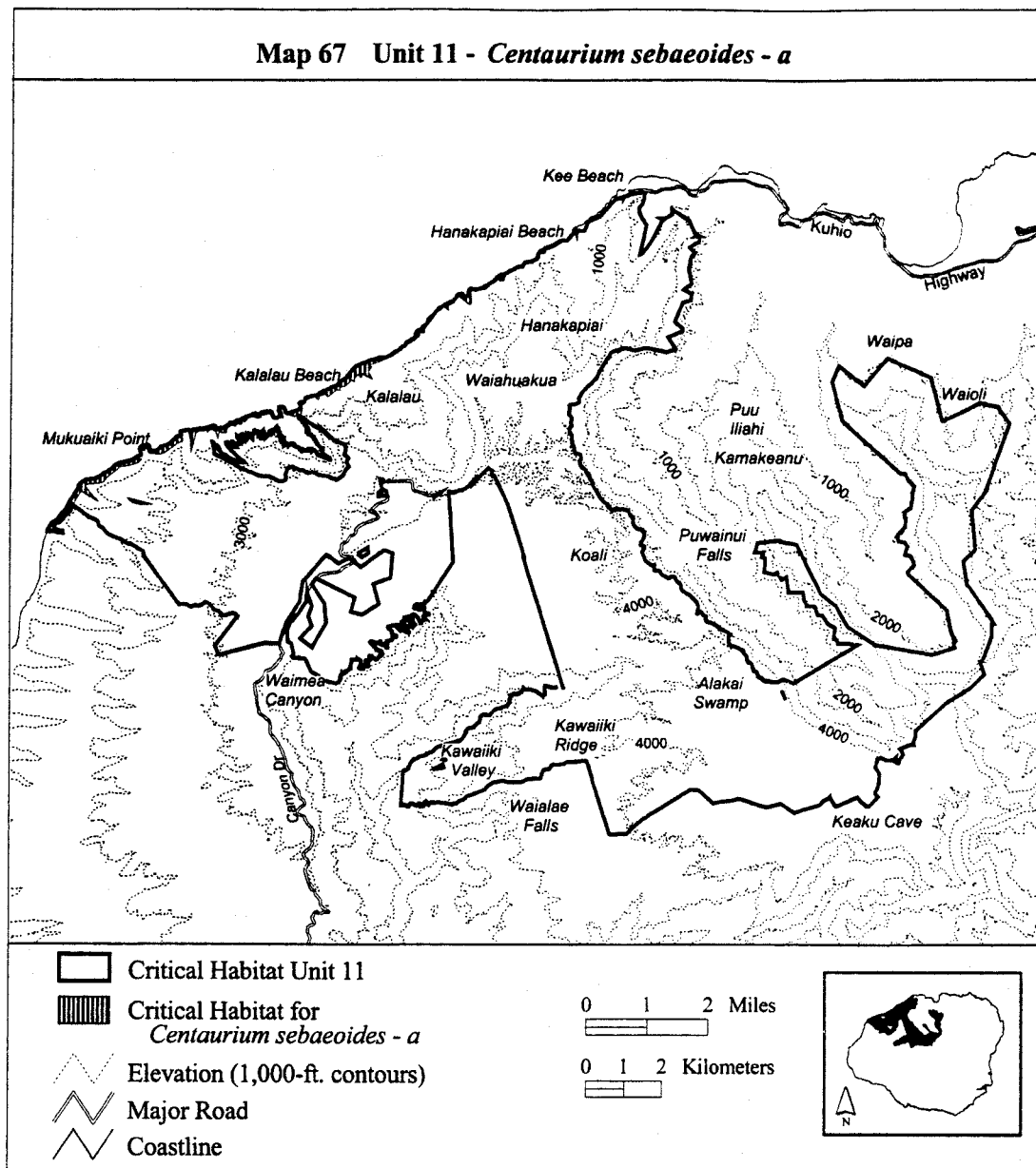
2452468; 432720, 2452373; 432710, 2452264; 432639, 2452321; 432487, 2452178; 432316, 2452117; 432330, 2452036; 432264, 2452055; 432008, 2451880; 431946, 2451956; 431789, 2451885; 431789, 2451823; 431756, 2451804; 431666, 2451899; 431447, 2451795; 431371, 2451676; 431286, 2451695; 431329, 2451576; 431310, 2451429; 431134, 2451353; 430963, 2451410; 430947, 2451439; 430893, 2451445; 430807, 2451586; 430761, 2451556; 430837, 2451309; 430777, 2451319; 430643, 2451285; 430595, 2451285; 430534, 2451345; 430495, 2451419; 430434, 2451441; 430326, 2451403; 430237, 2451411; 430239, 2451337; 430191, 2451306; 430126, 2451313; 430037, 2451352; 429905, 2451309; 429887, 2451259; 429807,

2451199; 429764, 2451267; 429734,
2451147; 429623, 2451176; 429575,
2451098; 429475, 2451133; 429351,
2451050; 429310, 2450929; 429219,
2450929; 429128, 2450959; 429108,
2450786; 429041, 2450972; 428972,
2451024; 428929, 2451037; 428857,

2450999; 428824, 2450925; 428797,
2450999; 428715, 2450981; 428640,
2450994; 428546, 2450948; 428384,
2450446; 428376, 2450782; 428325,
2450973; 428231, 2450952; 428150,
2450948; 428164, 2450704; 428047,
2450665; 427934, 2450565; 427801,

2450484; 427669, 2450378; 427543,
2450370; 427401, 2450386; 427318,
2450387; 427257, 2450448; 427213,
2450548; 427171, 2450463; coastline.

(B) Note: Map 67 follows:



(lxviii) Kauai 11—*Chamaesyce halemanui*—a (108 ha; 267 ac)

(A) Unit consists of the following boundary points: Start at 437683, 2443241; 437679, 2443194; 437679, 2443137; 437726, 2443130; 437800, 2443150; 437817, 2443127; 437817, 2443080; 437803, 2443033; 437834, 2443009; 437887, 2443019; 437907, 2443056; 437948, 2443043; 437974,

2443036; 438008, 2443046; 438042, 2443036; 438082, 2443070; 438122, 2443033; 438162, 2443003; 438196, 2443043; 438216, 2443029; 438223, 2442992; 438246, 2442986; 438280, 2442986; 438280, 2442952; 438246, 2442915; 438283, 2442821; 438310, 2442764; 438307, 2442707; 438273, 2442644; 438199, 2442520; 438176, 2442479; 438139, 2442419; 438109,

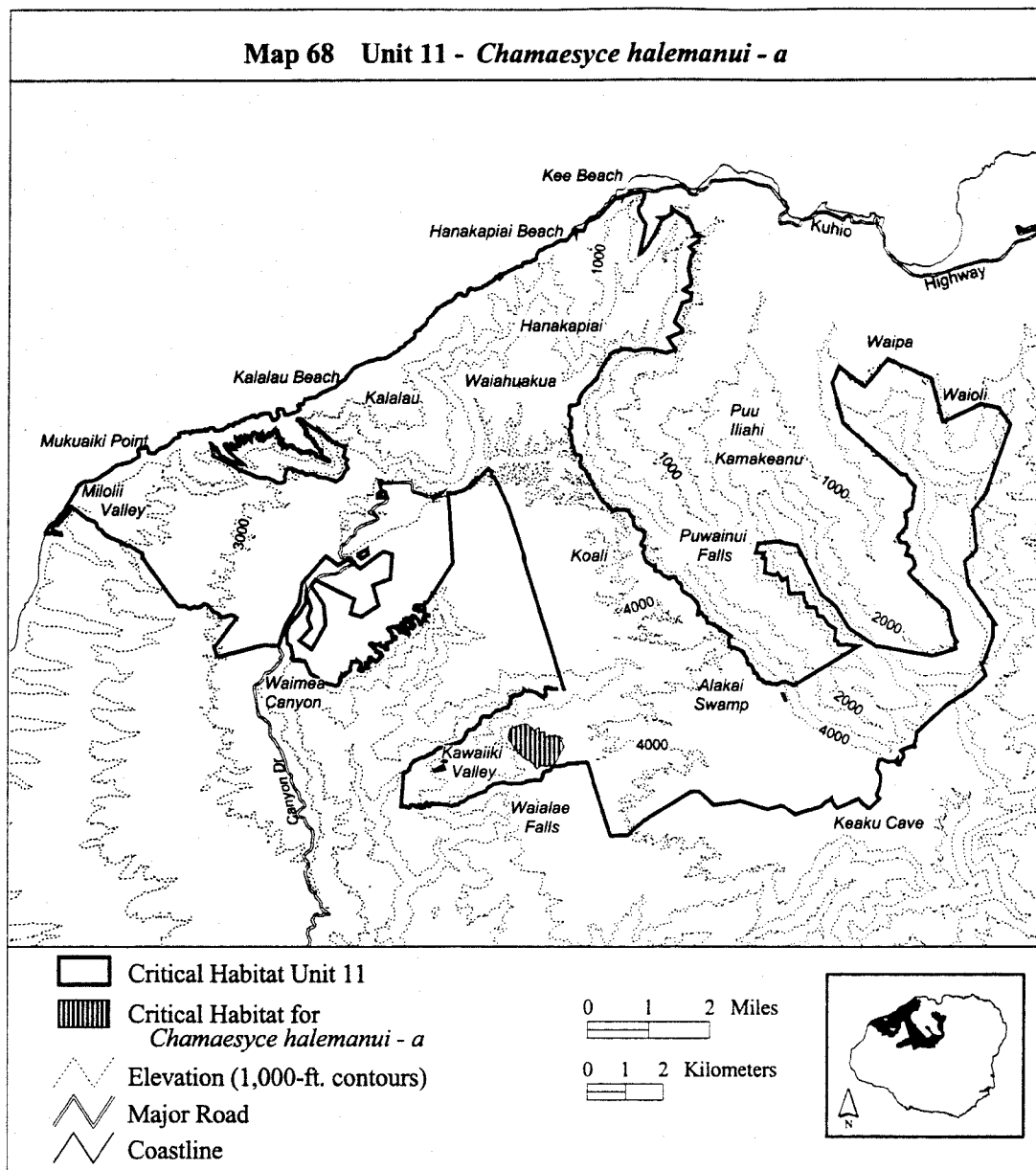
2442349; 438065, 2442285; 438066, 2442260; 438008, 2442239; 437971, 2442255; 437914, 2442255; 437830, 2442245; 437776, 2442271; 437676, 2442224; 437629, 2442167; 437572, 2442198; 437505, 2442302; 437438, 2442355; 437394, 2442392; 437314, 2442416; 437203, 2442506; 437015, 2442694; 436914, 2442875; 436847, 2442946; 436844, 2442986; 436847,

2443070; 436877, 2443160; 436901,
2443231; 436991, 2443258; 437062,
2443285; 437119, 2443301; 437186,
2443335; 437287, 2443345; 437334,

2443345; 437407, 2443308; 437428,
2443274; 437478, 2443264; 437485,
2443221; 437505, 2443184; 437579,

2443197; 437615, 2443237; 437652,
2443261; return to starting point.

(B) Note: Map 68 follows:



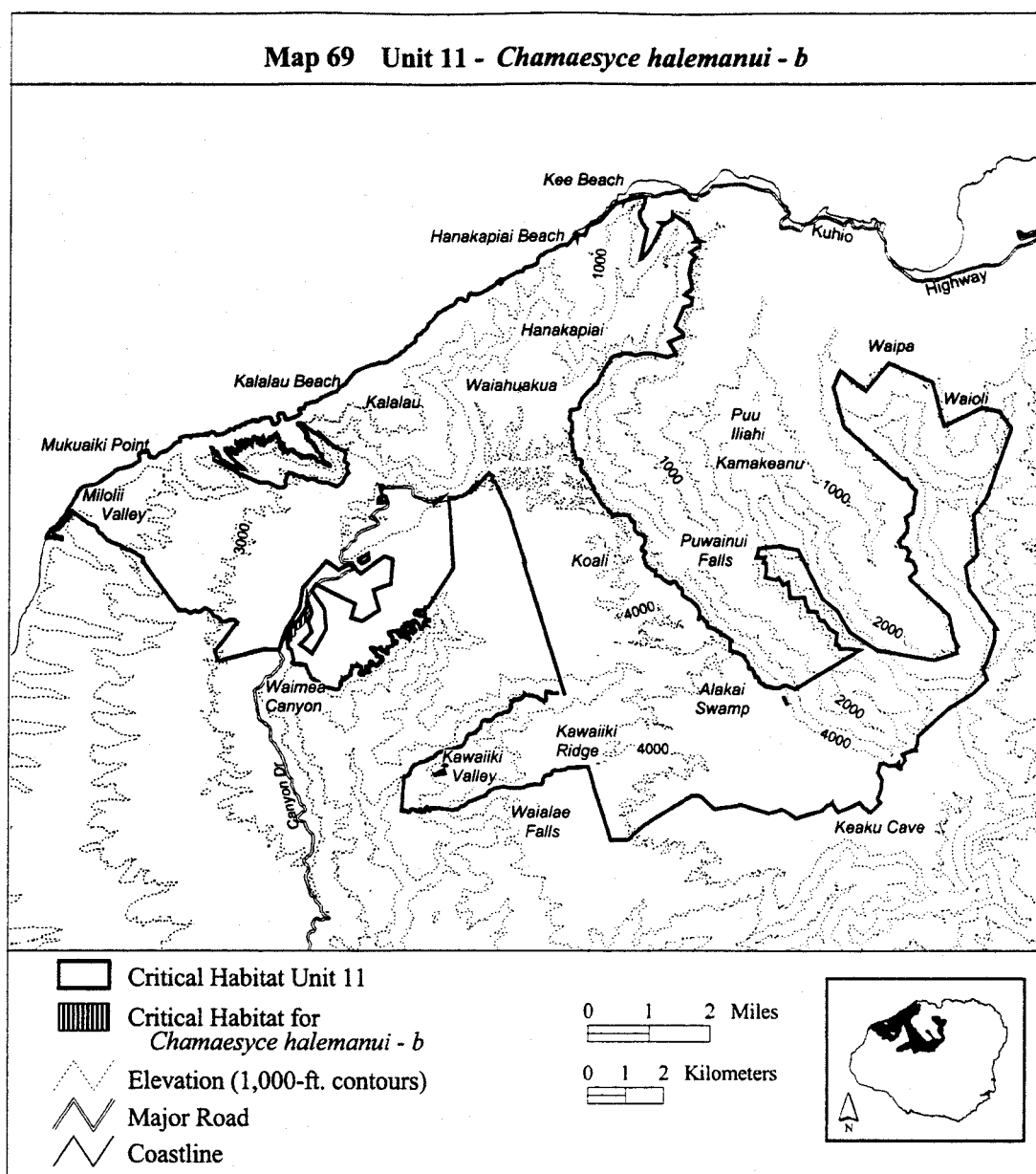
(Ixi) Kauai 11—*Chamaesyce halemanui*—b (17 ha; 43 ac)

(A) Unit consists of the following 26 boundary points: Start at 431534, 2446637; 431530, 2446604; 431553, 2446538; 431557, 2446483; 431526,

2446397; 431495, 2446365; 431522, 2446303; 431518, 2446216; 431487, 2446158; 431420, 2446115; 431408, 2446048; 431322, 2445985; 431256, 2445938; 431193, 2445891; 431201, 2445817; 431177, 2445766; 431099, 2445738; 431079, 2445703; 431079,

2445652; 431040, 2445613; 430985, 2445601; 430977, 2445767; 431060, 2445963; 431278, 2446215; 431483, 2446536; 431491, 2446759; return to starting point.

(B) Note: Map 69 follows:



(lxx) Kauai 11—*Chamaesyce halemanui*—c (1,283 ha; 3,171 ac)

(A) Unit consists of the following 195 boundary points: Start at 430306,

2449349; 430289, 2449399; 430307, 2449482; 430312, 2449517; 430313, 2449532; 430320, 2449553; 430331, 2449565; 430346, 2449596; 430354, 2449622; 430355, 2449641; 430348, 2449666; 430376, 2449750; 430384, 2449766; 430406, 2449796; 430471, 2449787; 430527, 2449754; 430583, 2449736; 430635, 2449693; 430696, 2449656; 430720, 2449646; 430819, 2449646; 430899, 2449674; 430918, 2449717; 430904, 2449834; 430927, 2449905; 430955, 2449985; 430993, 2450032; 431068, 2450041; 431153, 2450008; 431238, 2449970; 431285,

2449942; 431360, 2449956; 431449, 2449886; 431497, 2449867; 431605, 2449895; 431657, 2449890; 431699, 2449876; 431765, 2449810; 431864, 2449801; 431981, 2449792; 432047, 2449787; 432113, 2449740; 432217, 2449712; 432259, 2449679; 432344, 2449744; 432419, 2449806; 432471, 2449904; 432504, 2449961; 432579, 2450036; 432551, 2450083; 432523, 2450130; 432523, 2450182; 432565, 2450262; 432523, 2450304; 432475, 2450313; 432452, 2450337; 432461, 2450375; 432480, 2450426; 432490, 2450478; 432501, 2450529; 432504, 2450523; 432515, 2450503; 432528, 2450468; 432550, 2450412; 432573, 2450385; 432591, 2450373; 432650, 2450343; 432692, 2450330; 432709, 2450317; 432733, 2450275; 432745,

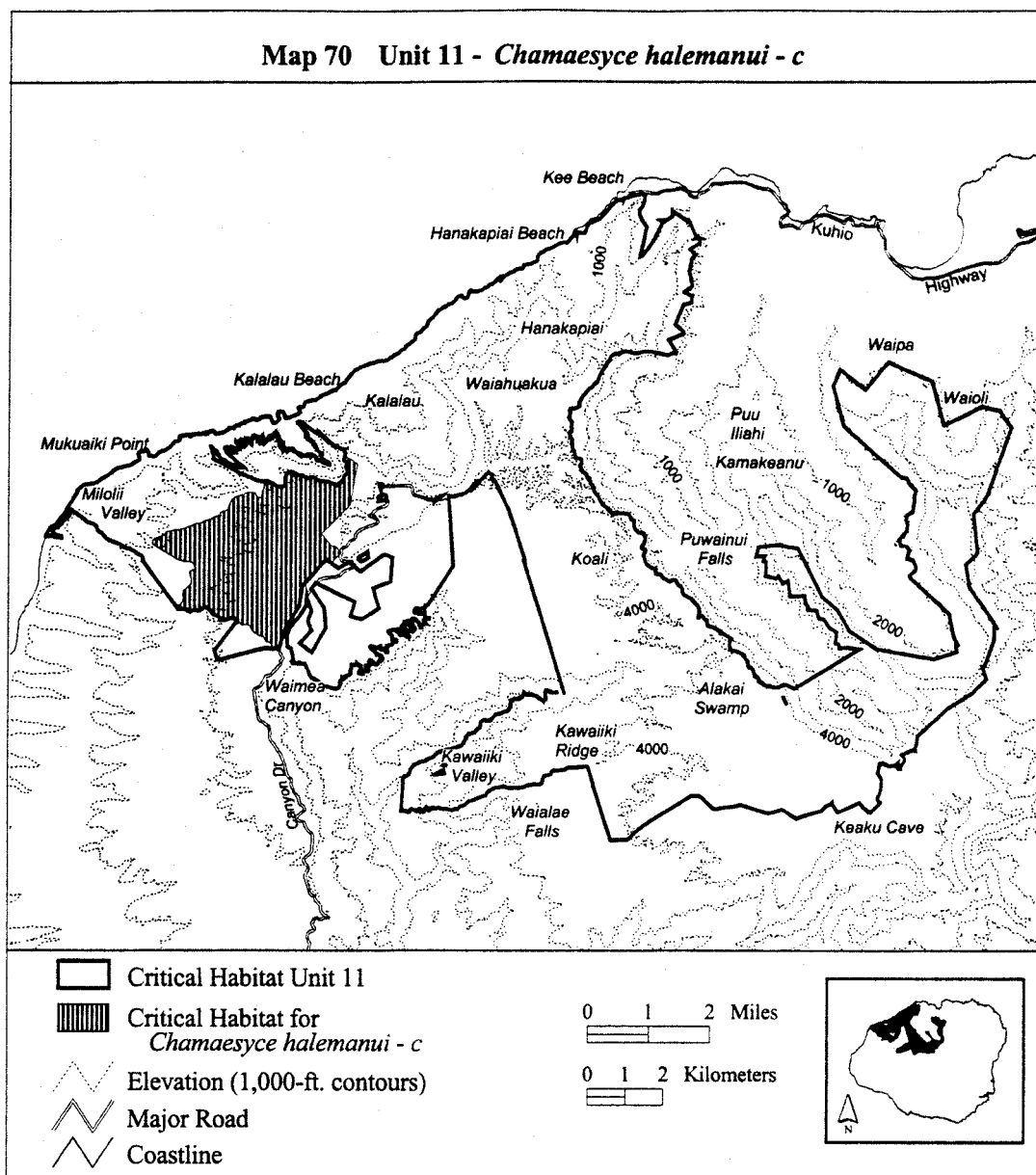
2450272; 432752, 2450270; 432768, 2450266; 432797, 2450260; 432826, 2450224; 432630, 2449144; 431875, 2448395; 432139, 2448086; 432281, 2448051; 432381, 2447879; 432133, 2447631; 432001, 2447726; 431369, 2447027; 431298, 2446522; 430955, 2445963; 430827, 2445619; 430786, 2445492; 430766, 2445492; 430727, 2445433; 430705, 2445408; 430574, 2445414; 430574, 2445437; 430570, 2445519; 430534, 2445558; 430444, 2445594; 430409, 2445613; 430386, 2445672; 430350, 2445711; 430264, 2445727; 430174, 2445786; 430060, 2445860; 430029, 2445923; 429990, 2446009; 429904, 2446040; 429857, 2446017; 429790, 2446025; 429708, 2446076; 429602, 2446170; 429547, 2446209; 429441, 2446185; 429335,

2446142; 429226, 2446146; 429202,
2446185; 429182, 2446221; 429128,
2446264; 429026, 2446295; 428990,
2446326; 428967, 2446373; 428920,
2446424; 428842, 2446479; 428791,
2446491; 428744, 2446448; 428669,
2446393; 428622, 2446381; 428548,
2446393; 428532, 2446420; 428469,
2446389; 428414, 2446358; 428359,
2446389; 428293, 2446424; 428242,
2446424; 428164, 2446424; 428093,
2446436; 428069, 2446495; 428101,
2446534; 428144, 2446534; 428218,
2446636; 428230, 2446734; 428226,
2446804; 428234, 2446918; 428312,

2446965; 428450, 2447079; 428450,
2447153; 428450, 2447216; 428422,
2447306; 428383, 2447376; 428407,
2447404; 428528, 2447466; 428548,
2447479; 428507, 2447592; 428472,
2447639; 428405, 2447665; 428282,
2447665; 428095, 2447725; 427746,
2447921; 427530, 2448058; 427416,
2448140; 427416, 2448207; 427479,
2448257; 427571, 2448308; 427733,
2448372; 427790, 2448451; 427901,
2448451; 427977, 2448483; 428009,
2448498; 428069, 2448498; 428158,
2448508; 428240, 2448527; 428266,
2448530; 428351, 2448581; 428421,

2448590; 428564, 2448666; 428694,
2448666; 428830, 2448749; 428948,
2448780; 429037, 2448822; 429113,
2448860; 429170, 2448891; 429208,
2448873; 429198, 2448944; 429399,
2449015; 429429, 2449039; 429423,
2449098; 429476, 2449205; 429494,
2449275; 429571, 2449358; 429683,
2449388; 429801, 2449435; 429819,
2449400; 429867, 2449476; 429991,
2449500; 430109, 2449500; 430156,
2449376; 430233, 2449358; 430287,
2449352; return to starting point.

(B) Note: Map 70 follows:



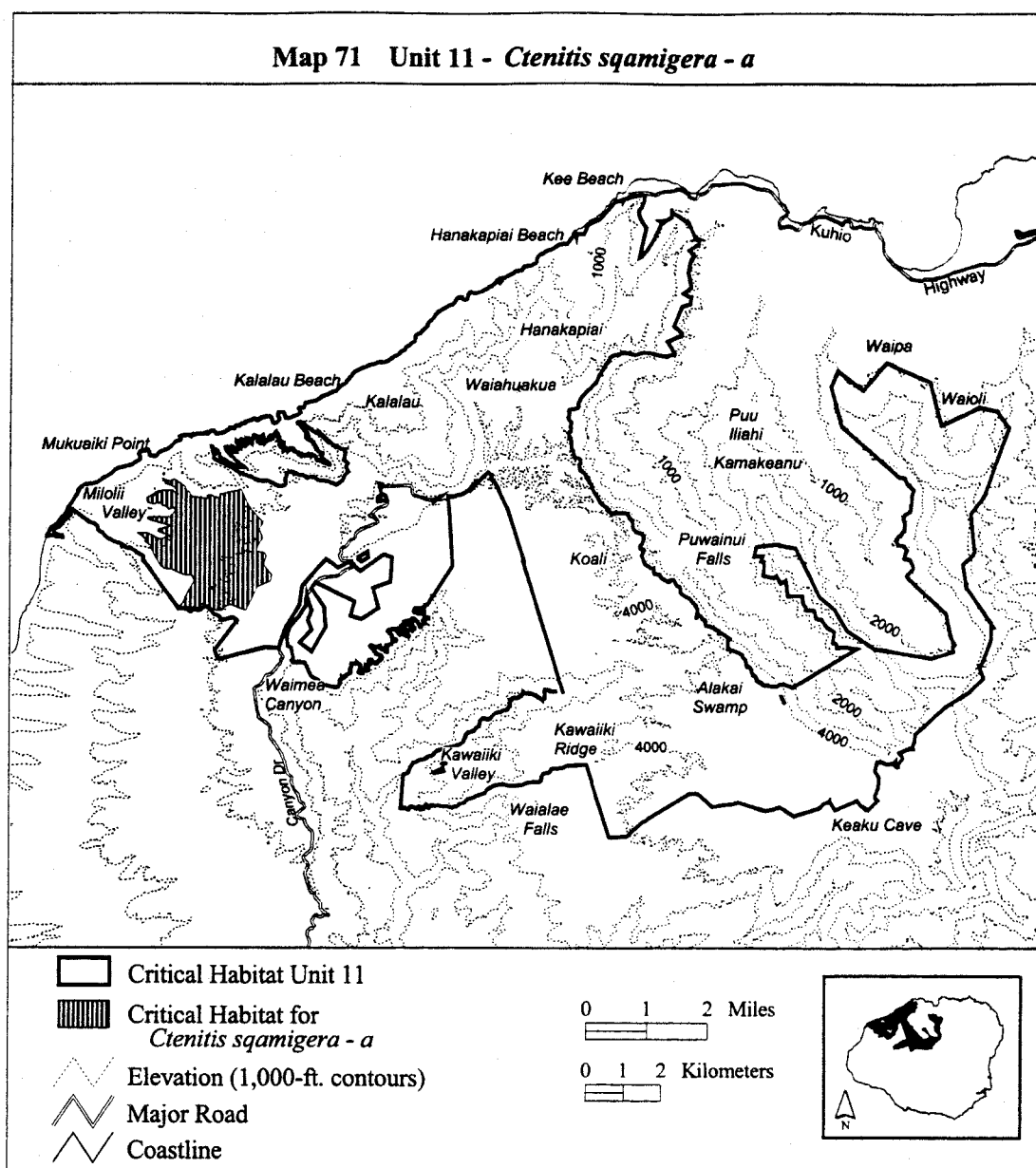
(lxxi) Kauai 11—*Ctenitis squamigera*—a
(735 ha; 1,817 ac)

(A) Unit consists of the following 95 boundary points: Start at 429915, 2449188; 429965, 2449062; 430201, 2448831; 430327, 2448700; 430306, 2448648; 430232, 2448495; 430290, 2448327; 430311, 2448243; 430232, 2448128; 430180, 2448034; 430159, 2447929; 430359, 2447892; 430411, 2447803; 430380, 2447729; 430348, 2447629; 430353, 2447566; 430558, 2447320; 430527, 2447152; 430190, 2446989; 430070, 2446732; 429881, 2446390; 429644, 2446469; 429497, 2446543; 429366, 2446511; 429303, 2446427; 429257, 2446389; 429094,

2446389; 428972, 2446421; 428904, 2446474; 428793, 2446542; 428740, 2446564; 428656, 2446475; 428599, 2446448; 428476, 2446463; 428396, 2446447; 428285, 2446458; 428164, 2446469; 428132, 2446490; 428200, 2446564; 428331, 2446837; 428510, 2447146; 428442, 2447304; 428247, 2447309; 428011, 2447409; 427922, 2447451; 427738, 2447467; 427607, 2447561; 427533, 2447692; 427386, 2447950; 427387, 2447965; 427327, 2448019; 427380, 2448042; 427201, 2448195; 427217, 2448242; 427012, 2448409; 427258, 2448415; 427607, 2448226; 427862, 2448339; 427544, 2448453; 427563, 2448503; 427874, 2448588; 427289, 2448764; 427276,

2448805; 427868, 2448846; 428032, 2449016; 427928, 2449075; 427852, 2449025; 427777, 2449101; 427632, 2449142; 427604, 2449204; 427487, 2449201; 427456, 2449157; 427267, 2449217; 427242, 2449308; 427289, 2449362; 427563, 2449519; 427915, 2449547; 428063, 2449431; 427988, 2449619; 427758, 2449701; 427651, 2449852; 427830, 2449773; 427975, 2449824; 428258, 2449632; 428274, 2449547; 428356, 2449494; 428447, 2449371; 428840, 2449311; 428840, 2449396; 428957, 2449415; 428994, 2449368; 429164, 2449330; 429174, 2449437; 429740, 2449559; 429916, 2449188; return to starting point.

(B) Note: Map 71 follows:



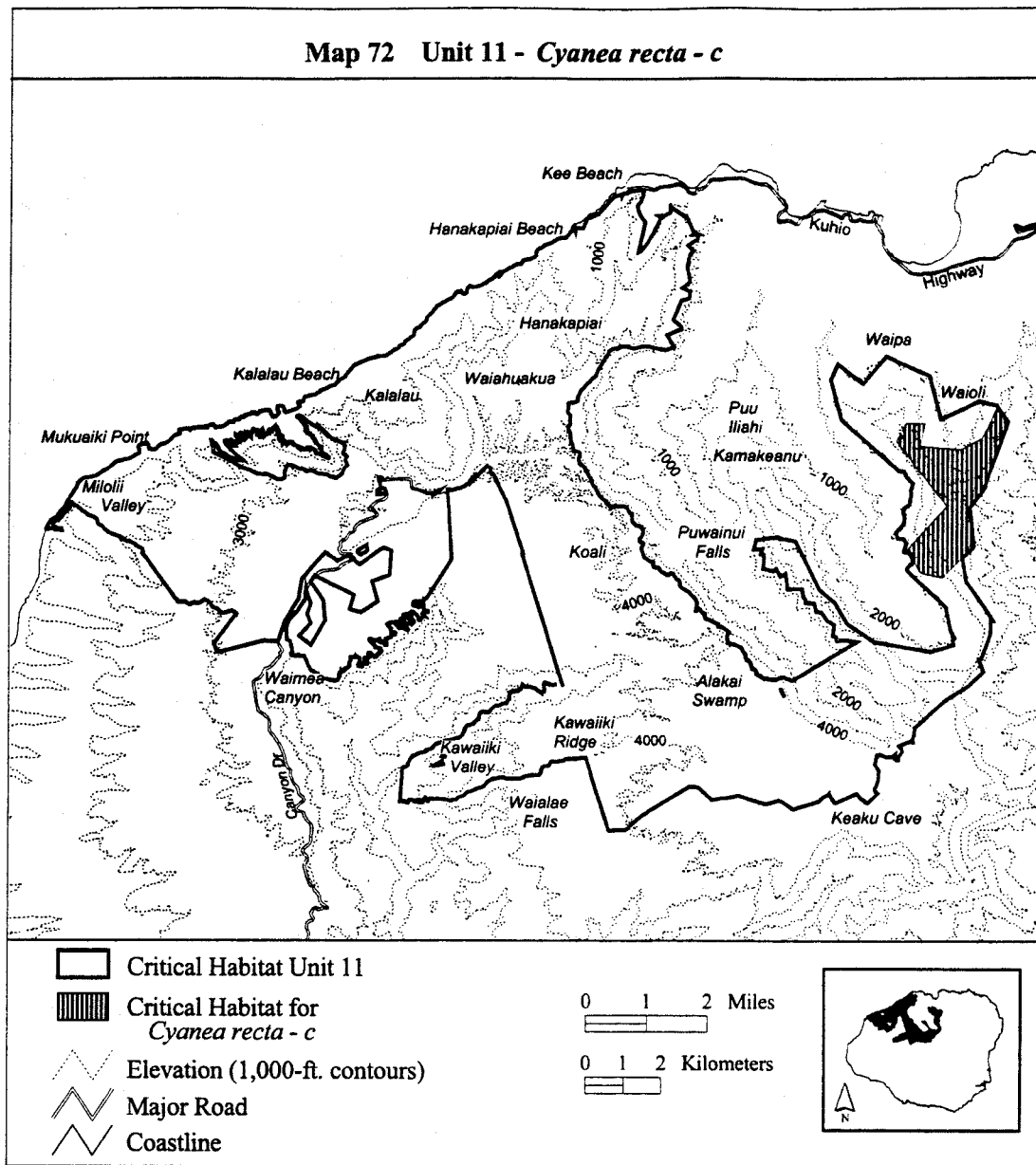
(lxxii) Kauai 11—*Cyanea recta*—c (553 ha; 1,367 ac)

(A) Unit consists of the following 21 boundary points: Start at 449858, 2451521; 450073, 2451227; 449432,

2449395; 449073, 2448923; 449139, 2447988; 449020, 2447860; 448992, 2447717; 448881, 2447609; 448339, 2447084; 447861, 2447198; 447734, 2447260; 447428, 2447829; 448470, 2448968; 447125, 2450677; 447365,

2451166; 447874, 2451166; 447753, 2450562; 448823, 2450472; 449385, 2450762; 449623, 2451217; 449789, 2451615; return to starting point.

(B) Note: Map 72 follows:



(lxxiii) Kauai 11—*Cyanea recta*—d (397 ha; 981 ac)

(A) Unit consists of the following 95 boundary points: Start at 439347, 2452789; 439324, 2452794; 439098, 2452402; 438924, 2452225; 438576, 2451872; 438558, 2451853; 438541, 2451836; 438516, 2451811; 438493, 2451829; 438494, 2451843; 438496, 2451871; 438498, 2451889; 438597, 2453123; 438761, 2453483; 439385,

2453352; 439352, 2454138; 439582, 2455646; 439652, 2455480; 439844, 2455023; 441271, 2456733; 441363, 2456677; 441568, 2456107; 441546, 2456104; 441531, 2456098; 441511, 2456077; 441498, 2456050; 441482, 2456033; 441462, 2456017; 441414, 2455967; 441393, 2455942; 441365, 2455913; 441354, 2455880; 441351, 2455829; 441342, 2455800; 441333, 2455787; 441292, 2455760; 441264, 2455739; 441233, 2455700; 441199,

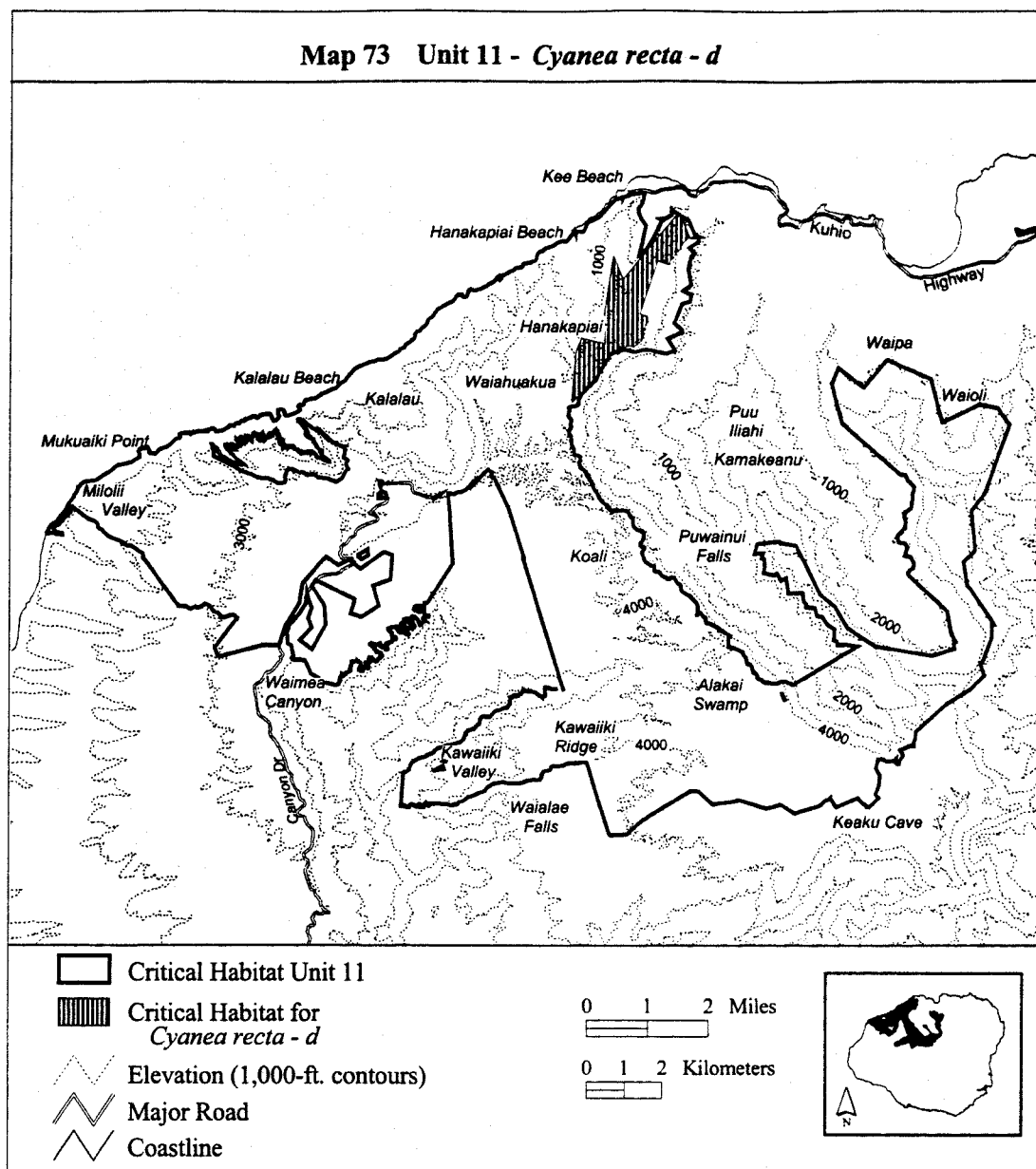
2455663; 441185, 2455633; 441176, 2455603; 441164, 2455584; 441148, 2455564; 441094, 2455523; 441060, 2455488; 441059, 2455449; 441071, 2455421; 441074, 2455406; 441073, 2455402; 440747, 2455513; 440294, 2454127; 440499, 2454060; 440485, 2453995; 440492, 2453950; 440484, 2453922; 440461, 2453865; 440450, 2453851; 440432, 2453815; 440421, 2453780; 440412, 2453745; 440410, 2453716; 440404, 2453694; 440384,

2453655; 440378, 2453623; 440380,
2453590; 440370, 2453517; 440363,
2453496; 440355, 2453461; 440350,
2453451; 440333, 2453428; 440315,
2453408; 440288, 2453388; 440275,
2453381; 440244, 2453334; 440223,

2453322; 440199, 2453305; 440147,
2453289; 440119, 2453282; 440093,
2453280; 439987, 2453284; 439962,
2453283; 439924, 2453275; 439905,
2453264; 439787, 2453162; 439724,
2453135; 439639, 2453119; 439600,

2453107; 439553, 2453082; 439503,
2453046; 439481, 2453022; 439473,
2452985; 439464, 2452963; 439414,
2452909; 439390, 2452876; 439355,
2452801; return to starting point.

(B) Note: Map 73 follows:



(lxxiv) Kauai 11—*Cyanea remyi*—c (365 ha; 901 ac)

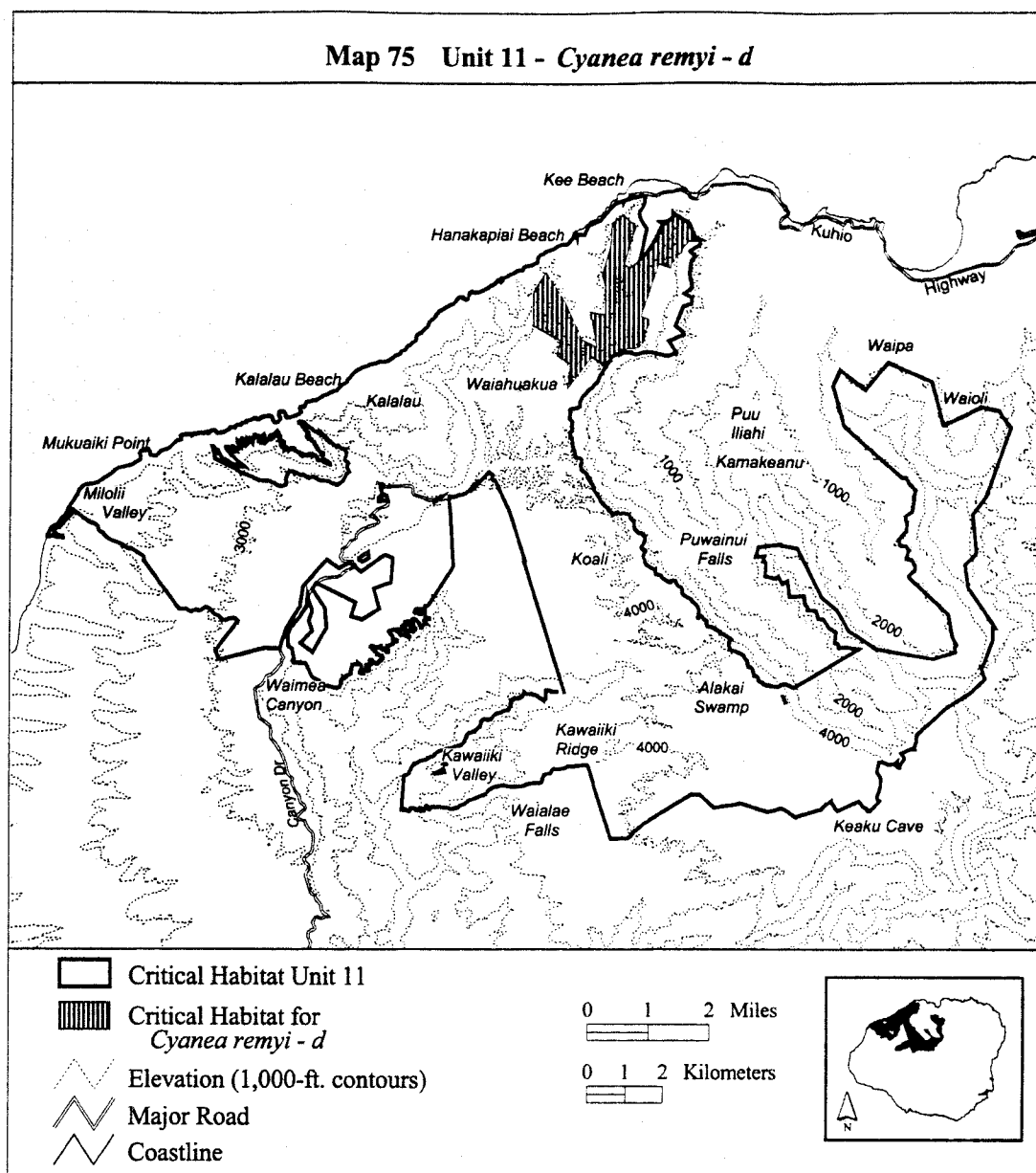
(A) Unit consists of the following 15 boundary points: Start at 448511,

2450831; 449003, 2450929; 449335, 2451756; 449751, 2451666; 449858, 2451521; 450073, 2451227; 449580, 2449817; 449301, 2449658; 449293, 2449649; 449066, 2449578; 448089,

2449815; 447754, 2449877; 447125, 2450677; 447365, 2451166; 448229, 2451166; return to starting point.

(B) Note: Map 74 follows:





(lxxvi) Kauai 11—*Cyperus trachysanthos*—a (434 ha; 1,071 ac)

(A) Unit consists of the following 243 boundary points: coastline; 436143, 2454005; 435790, 2454155; 435524, 2454345; 435470, 2454260; 435347, 2454246; 435388, 2454013; 435219, 2454036; 435223, 2453904; 435026, 2453931; 435040, 2453758; 434757, 2453703; 434734, 2453379; 434601, 2453383; 434455, 2453232; 434121, 2453118; 433837, 2452844; 433499, 2452785; 433778, 2452049; 433636, 2451866; 433009, 2452049; 432973, 2452150; 432840, 2452050; 432813, 2452159; 432735, 2452082; 432689, 2452182; 432483, 2452063; 432424, 2451917; 432378, 2451881; 432273, 2451876; 432232, 2451707; 432173, 2451699; 432163, 2451570; 431916,

2451812; 431811, 2451702; 431683, 2451766; 431518, 2451629; 431445, 2451593; 431440, 2451515; 431326, 2451415; 431115, 2451323; 430997, 2451374; 431134, 2451200; 431102, 2451054; 431303, 2450848; 431051, 2450912; 430942, 2451017; 430859, 2450994; 430850, 2451168; 430745, 2451186; 430713, 2451255; 430544, 2451223; 430489, 2451269; 430475, 2451150; 430379, 2451209; 430352, 2451045; 430237, 2451109; 430201, 2451040; 430141, 2451068; 430068, 2451200; 429995, 2451049; 429908, 2451100; 429899, 2451013; 429862, 2450990; 429807, 2451031; 429798, 2450944; 429670, 2451086; 429647, 2450908; 429519, 2450985; 429524, 2450839; 429441, 2450876; 429428, 2450775; 429368, 2450839; 429295,

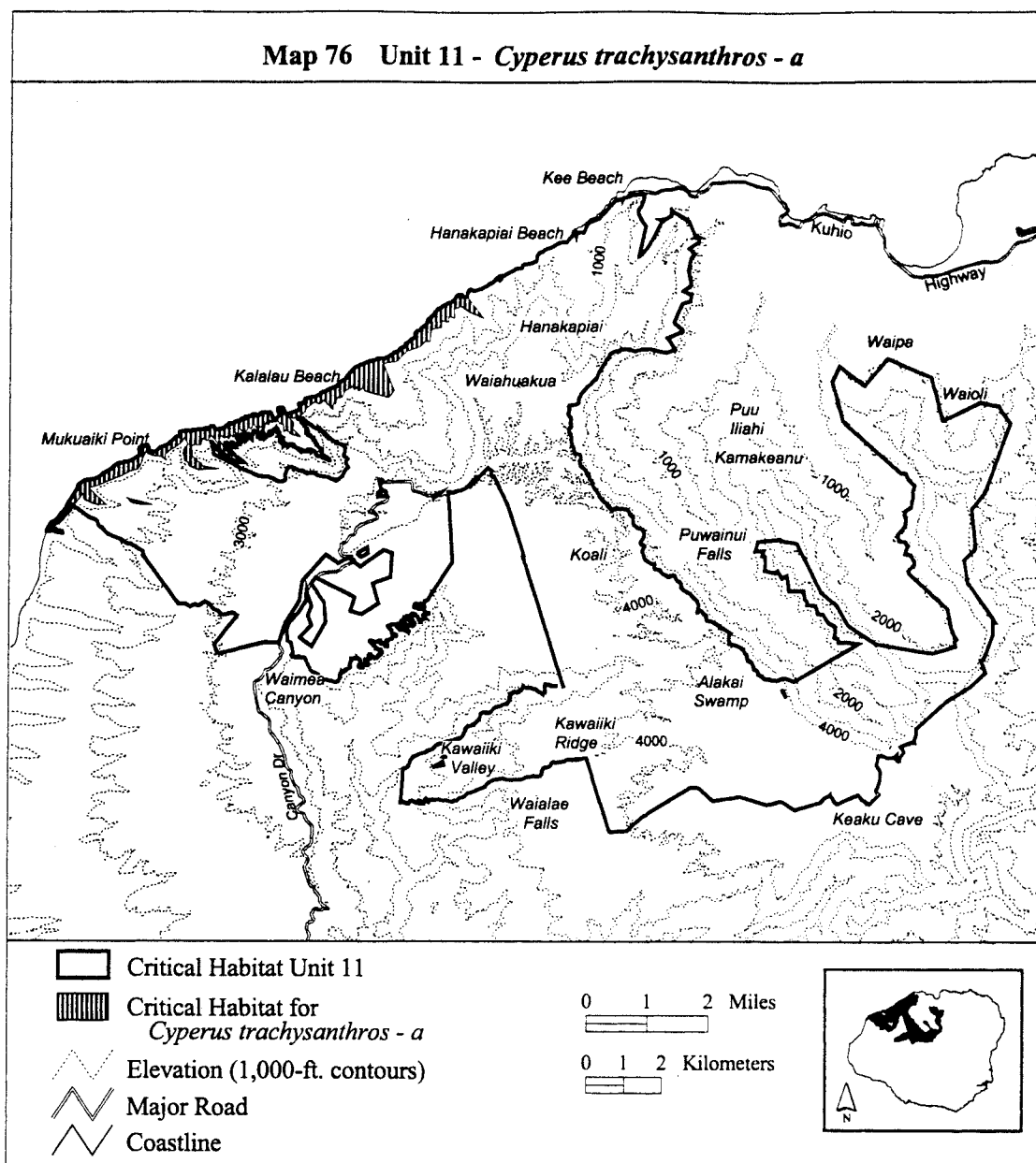
2450803; 429194, 2450889; 429176, 2450832; 429167, 2450752; 429341, 2450469; 429501, 2450314; 429277, 2450419; 429121, 2450684; 429066, 2450711; 429016, 2450803; 428947, 2450867; 428852, 2450725; 428718, 2450784; 428677, 2450629; 428494, 2450620; 428439, 2450574; 428467, 2450286; 428563, 2450254; 428577, 2450181; 428696, 2450131; 428718, 2450058; 429126, 2449985; 428627, 2449953; 428357, 2450071; 428348, 2450154; 428247, 2450209; 428256, 2450282; 428202, 2450373; 428234, 2450515; 428334, 2450643; 428229, 2450807; 428192, 2450711; 428032, 2450579; 427849, 2450474; 427735, 2450364; 427730, 2450273; 427767, 2450222; 427607, 2450314; 427424, 2450332; 427278, 2450382; 427232,

2450464; 427187, 2450350; 427044,
2450030; 426976, 2449971; 426802,
2449921; 426583, 2449806; 426111,
2449624; 426084, 2449592; 425722,
2449473; 425854, 2449326; 426171,
2449034; 425960, 2449029; 425741,
2449098; 425576, 2449176; 425548,
2449331; 425490, 2449258; 425402,
2449098; 425340, 2449032; 425322,
2448983; 425322, 2448984; 425310,
2448993; 425272, 2449039; 425267,
2449033; 425258, 2449022; 425253,
2449013; 425252, 2449003; 425253,
2448996; 425251, 2448992; 425242,
2448981; 425239, 2448972; 425231,
2448956; 425224, 2448934; 425222,
2448911; 425223, 2448900; 425224,
2448891; 425223, 2448883; 425218,
2448877; 425212, 2448878; 425208,
2448876; 425201, 2448872; 425192,
2448867; 425181, 2448859; 425172,
2448853; 425162, 2448844; 425158,
2448833; 425157, 2448818; 425153,

2448809; 425148, 2448807; 425136,
2448801; 425124, 2448795; 425120,
2448790; 425112, 2448785; 425100,
2448774; 425094, 2448768; 425081,
2448757; 425070, 2448745; 425062,
2448734; 425053, 2448723; 425044,
2448711; 425043, 2448695; 425029,
2448684; 425024, 2448675; 425017,
2448667; 425011, 2448659; 424999,
2448650; 424991, 2448642; 424980,
2448628; 424973, 2448615; 424956,
2448592; 424936, 2448587; 424929,
2448581; 424924, 2448574; 424917,
2448569; 424910, 2448561; 424906,
2448551; 424898, 2448552; 424886,
2448554; 424877, 2448554; 424871,
2448552; 424863, 2448548; 424849,
2448543; 424840, 2448538; 424824,
2448534; 424811, 2448524; 424803,
2448521; 424795, 2448511; 424785,
2448498; 424778, 2448484; 424774,
2448461; 424778, 2448445; 424791,
2448421; 424819, 2448402; 424832,

2448389; 424848, 2448376; 424871,
2448368; 424900, 2448356; 424929,
2448346; 424953, 2448337; 424973,
2448335; 424990, 2448333; 424997,
2448333; 425003, 2448327; 425006,
2448318; 425009, 2448308; 425011,
2448298; 425013, 2448289; 425015,
2448280; 425010, 2448272; 424998,
2448277; 424991, 2448284; 424983,
2448288; 424971, 2448291; 424957,
2448291; 424948, 2448290; 424933,
2448287; 424927, 2448284; 424915,
2448289; 424892, 2448299; 424874,
2448301; 424841, 2448311; 424823,
2448330; 424803, 2448337; 424777,
2448336; 424735, 2448339; 424711,
2448334; 424677, 2448333; 424664,
2448328; 424648, 2448323; 424633,
2448323; 424603, 2448328; 435703,
2454582; coastline.

(B) **Note:** Map 76 follows:



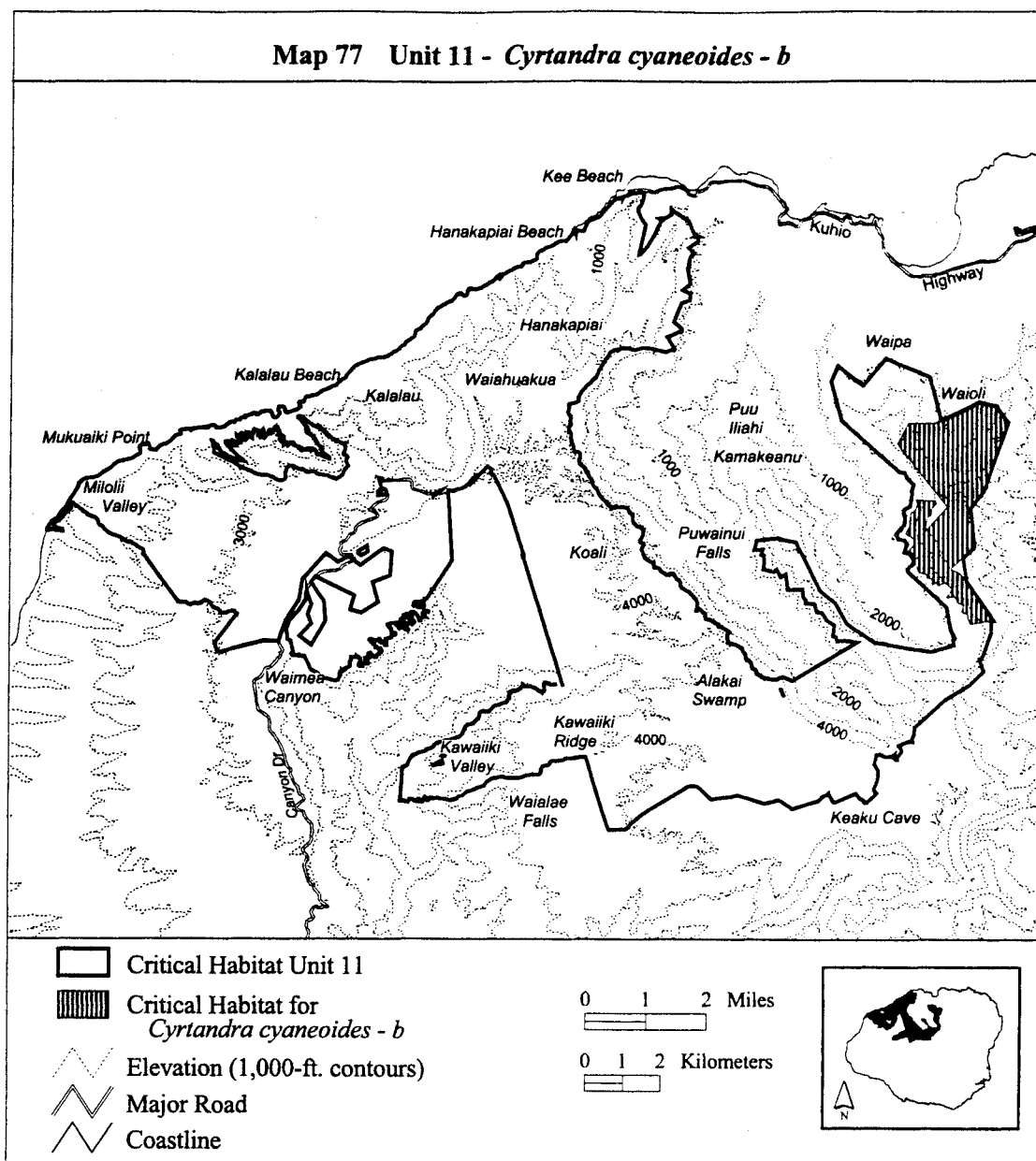
(lxxvii) Kauai 11—*Cyrtandra cyaneoides*—b (848 ha; 2,095 ac)

(A) Unit consists of the following 75 boundary points: Start at 449861, 2451529; 450084, 2451212; 449426, 2449387; 449074, 2448967; 449179, 2447924; 448876, 2447641; 448557, 2447345; 448557, 2447312; 448681, 2447286; 448798, 2447208; 448908, 2447104; 448960, 2446994; 448980, 2446982; 449012, 2446961; 449637, 2446073; 449643, 2446064; 449701, 2445980; 449643, 2445970; 449090, 2445877; 449051, 2445968; 449012,

2446098; 448993, 2446163; 448869, 2446202; 448902, 2446403; 448798, 2446409; 448720, 2446481; 448694, 2446585; 448629, 2446617; 448460, 2446578; 448603, 2446812; 448408, 2446975; 448219, 2446884; 448174, 2446975; 448076, 2446916; 448076, 2447072; 447927, 2447098; 447912, 2447199; 447715, 2447234; 447448, 2447822; 447569, 2447951; 447569, 2448073; 447563, 2448144; 447368, 2448248; 447394, 2448358; 447465, 2448443; 447459, 2448592; 447472, 2448677; 447491, 2448806; 447615, 2448891; 447680, 2449047; 447621,

2449157; 448135, 2449124; 448161, 2449040; 448102, 2449001; 448089, 2448962; 448044, 2448930; 448044, 2448891; 448037, 2448845; 448037, 2448793; 448011, 2448754; 447992, 2448715; 447946, 2448722; 447914, 2448618; 447901, 2448514; 447888, 2448371; 447903, 2448341; 448447, 2448963; 447139, 2450654; 447435, 2451197; 448110, 2451196; 448295, 2451280; 448295, 2451280; 448306, 2451285; 449344, 2451755; 449772, 2451656; return to starting point.

(B) **Note:** Map 77 follows:



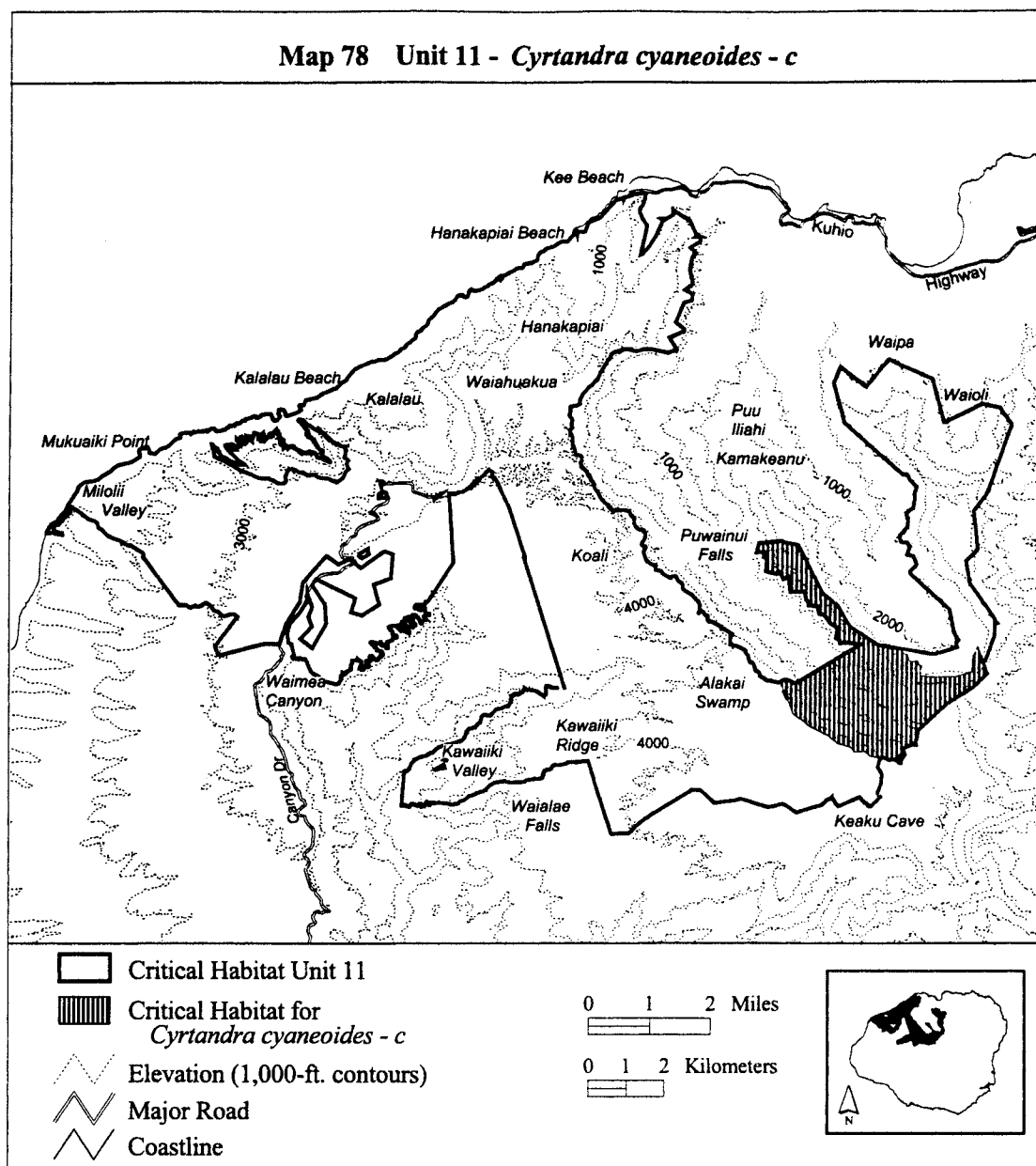
(lxxviii) Kauai 11—*Cyrtandra cyaneoides*—c (1,118 ha; 2,763 ac)

(A) Unit consists of the following 94 boundary points: Start at 449346, 2444938; 449459, 2444635; 449081, 2444273; 448798, 2444099; 448808, 2444095; 448479, 2443895; 448470, 2443888; 448470, 2443889; 448458, 2443882; 447645, 2443146; 447630, 2442948; 447577, 2442842; 447599, 2442773; 447508, 2442781; 447227, 2442660; 447295, 2442584; 447303, 2442515; 447197, 2442356; 447197, 2442303; 447151, 2442303; 447113, 2442348; 447128, 2442447; 447060, 2442386; 446885, 2442379; 446771, 2442439; 446645, 2442430; 446392,

2442475; 446233, 2442597; 445958, 2442590; 445854, 2442727; 445527, 2442820; 445264, 2443031; 445101, 2443109; 444763, 2443280; 444640, 2443388; 444336, 2443592; 444214, 2443918; 444073, 2444237; 443984, 2444419; 444071, 2444486; 444162, 2444498; 444398, 2444392; 446102, 2445409; 445791, 2445455; 445563, 2445432; 445555, 2445554; 445464, 2445569; 445495, 2445850; 445297, 2445979; 445160, 2446184; 445023, 2446199; 444955, 2446412; 444727, 2446435; 444727, 2446518; 444674, 2446572; 444636, 2446799; 444256, 2446777; 444203, 2447187; 444066, 2447118; 443960, 2447308; 443876, 2447248; 443595, 2447316; 443618,

2447460; 443610, 2447688; 443542, 2447696; 443580, 2447840; 443352, 2447817; 443420, 2448068; 444020, 2448144; 444089, 2448098; 444454, 2448029; 445092, 2446769; 445495, 2446450; 445821, 2445880; 446566, 2445401; 446809, 2445363; 446811, 2445362; 447161, 2445302; 447195, 2445249; 447262, 2445171; 447352, 2445171; 447396, 2444981; 447463, 2444948; 447564, 2444981; 447631, 2444981; 447665, 2444858; 447754, 2444858; 447676, 2444668; 447682, 2444602; 448036, 2444548; 448629, 2444567; 449056, 2444698; 449077, 2445069; 449193, 2445350; return to starting point.

(B) **Note:** Map 78 follows:



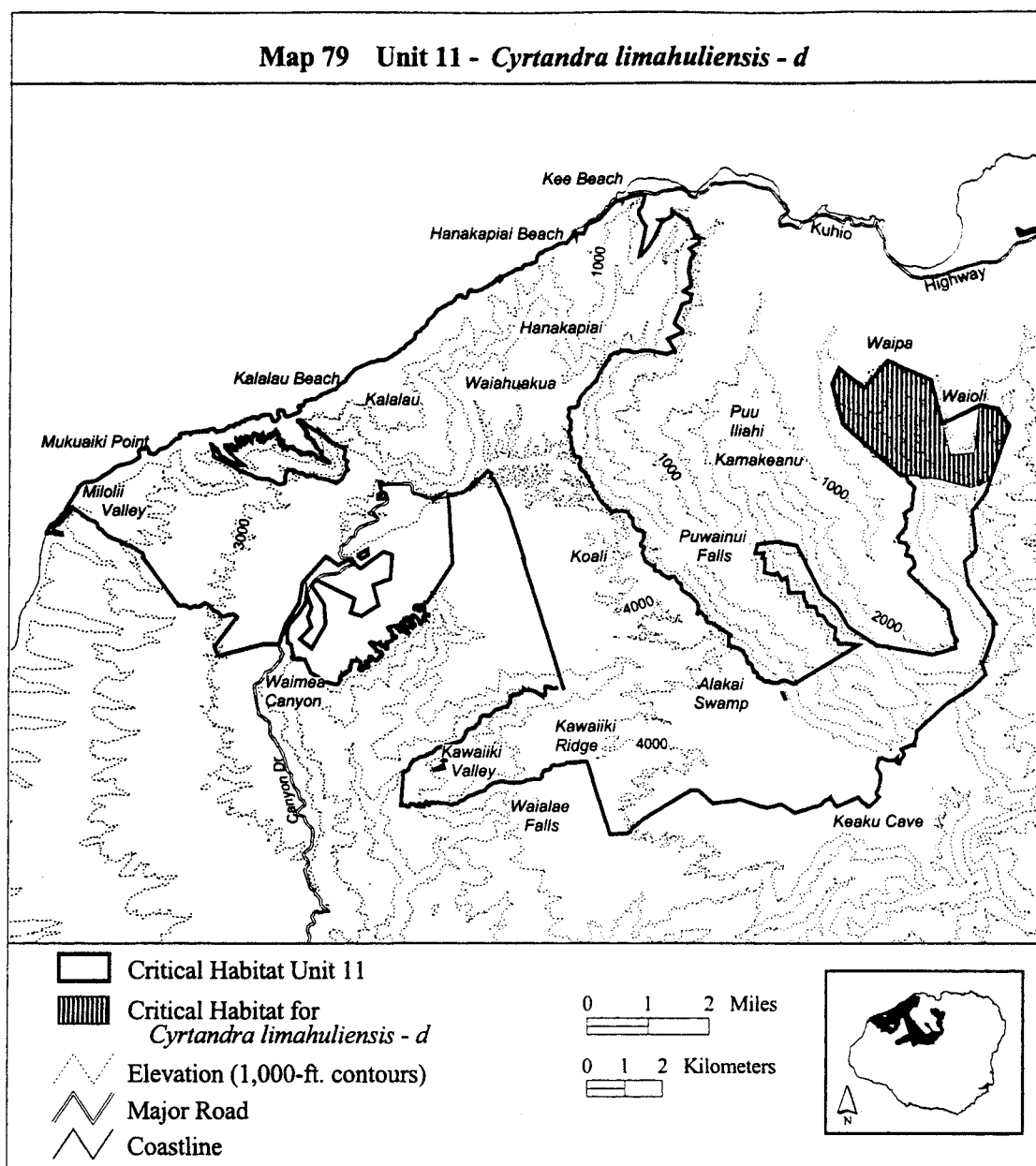
(lxxix) Kauai 11—*Cyrtandra limahuliensis*—d (816 ha; 2,016 ac)

(A) Unit consists of the following 33 boundary points: Start at 448313, 2451213; 448519, 2450440; 448878, 2450478; 449147, 2450506; 449269, 2451755; 449288, 2451766; 449751,

2451666; 449858, 2451521; 450073, 2451227; 449575, 2449805; 449289, 2449638; 449295, 2449676; 449206, 2449638; 449066, 2449578; 448845, 2449631; 448232, 2449780; 447892, 2449847; 447888, 2449814; 447596, 2449889; 447198, 2449897; 445666, 2451248; 445376, 2452300; 445547,

2452722; 446226, 2452194; 446834, 2452923; 446988, 2452850; 447991, 2452420; 448004, 2452370; 448015, 2452365; 448045, 2452217; 448294, 2451285; 448295, 2451280; 448295, 2451280; return to starting point.

(B) **Note:** Map 79 follows:



(lxxx) Kauai 11—*Cyrtandra limahuliensis*—e (693 ha; 1,712 ac)

(A) Unit consists of the following 132 boundary points: Start at 439377, 2452849; 439385, 2452892; 439375, 2452895; 439303, 2452917; 439254, 2452860; 439091, 2452982; 438975, 2453018; 438381, 2452259; 438382, 2452266; 438335, 2452205; 438433, 2452860; 438072, 2453090; 438113, 2453336; 438084, 2453513; 437456, 2453744; 437460, 2453870; 437449, 2453877; 437449, 2454762; 437600, 2455005; 437720, 2455261; 437744, 2455234; 437777, 2455286; 437998, 2454941; 438150, 2454766; 438447, 2454337; 438660, 2453669; 438688, 2453607; 439106, 2453412; 439045, 2453751; 438876, 2454238; 438959,

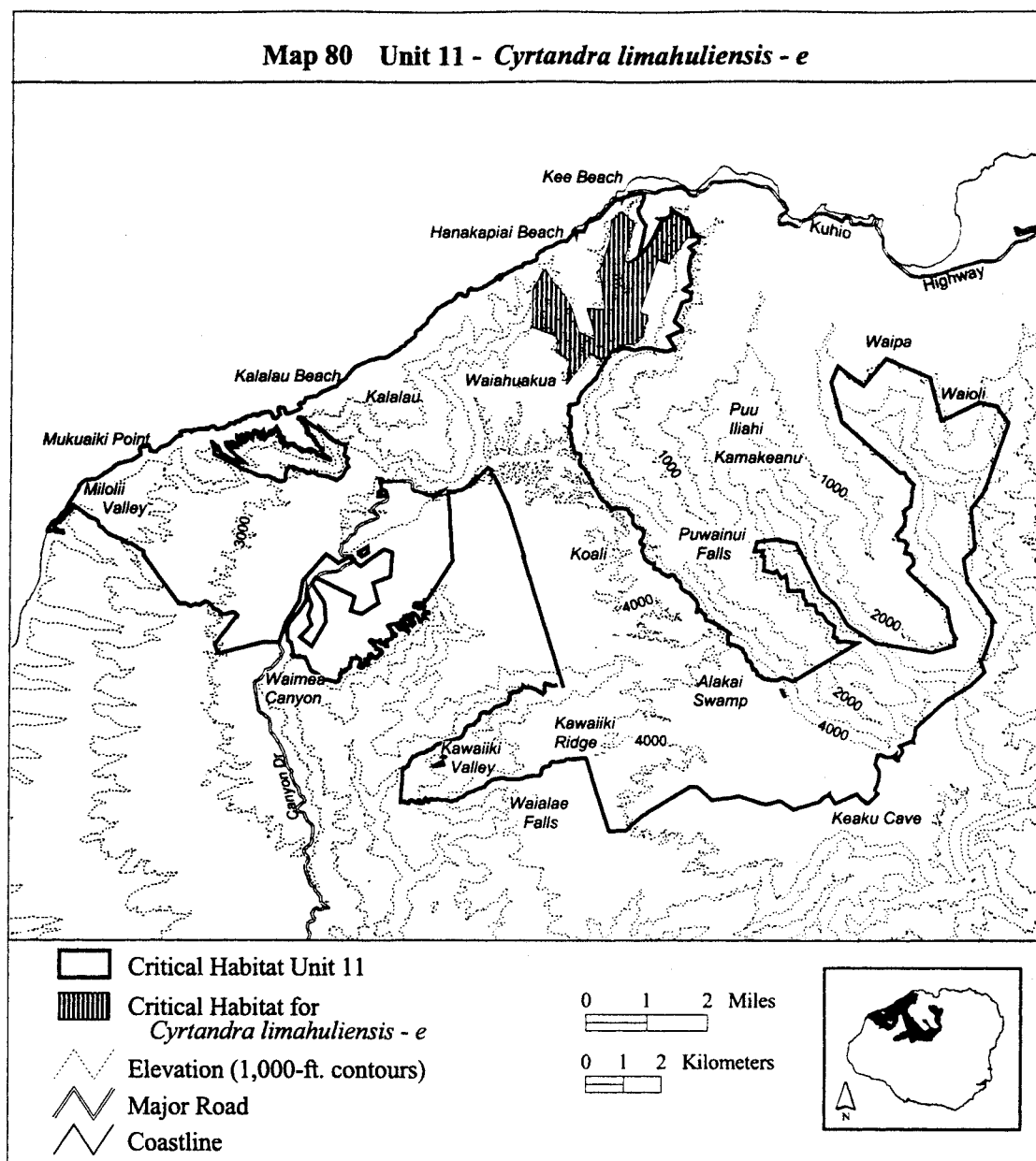
2454233; 438958, 2454237; 439001, 2454230; 439352, 2454206; 439352, 2454221; 439352, 2454326; 439206, 2455228; 439438, 2455920; 439489, 2456098; 439516, 2456564; 439685, 2456695; 439735, 2456777; 439762, 2456755; 439800, 2456784; 439811, 2456793; 440139, 2456498; 440126, 2456452; 440131, 2456448; 440083, 2456303; 439860, 2455537; 439966, 2455458; 440428, 2455755; 440674, 2456209; 440829, 2456531; 441205, 2456774; 441566, 2456551; 441751, 2456130; 441694, 2456118; 441663, 2456114; 441635, 2456115; 441546, 2456104; 441531, 2456098; 441511, 2456077; 441498, 2456050; 441482, 2456033; 441462, 2456017; 441414, 2455967; 441393, 2455942; 441365,

2455913; 441354, 2455880; 441351, 2455829; 441342, 2455800; 441333, 2455787; 441292, 2455760; 441264, 2455739; 441233, 2455700; 441199, 2455663; 441185, 2455633; 441176, 2455603; 441164, 2455584; 441148, 2455564; 441094, 2455523; 441060, 2455488; 441059, 2455449; 441071, 2455421; 441074, 2455406; 441073, 2455402; 440747, 2455513; 440294, 2454127; 440499, 2454060; 440485, 2453995; 440492, 2453950; 440484, 2453922; 440461, 2453865; 440450, 2453851; 440432, 2453815; 440421, 2453780; 440412, 2453745; 440410, 2453716; 440404, 2453694; 440384, 2453655; 440378, 2453623; 440380, 2453590; 440370, 2453517; 440363, 2453496; 440355, 2453461; 440350,

2453451; 440333, 2453428; 440315,
2453408; 440288, 2453388; 440275,
2453381; 440244, 2453334; 440223,
2453322; 440199, 2453305; 440147,
2453289; 440119, 2453282; 440093,

2453280; 439987, 2453284; 439962,
2453283; 439924, 2453275; 439905,
2453264; 439787, 2453162; 439724,
2453135; 439639, 2453119; 439600,
2453107; 439553, 2453082; 439503,

2453046; 439481, 2453022; 439473,
2452985; 439464, 2452963; 439414,
2452909; 439390, 2452876; return to
starting point.
(B) Note: Map 80 follows:



(lxxxix) Kauai 11—*Delissea rhytidosperra*—b (258 ha; 638 ac)

(A) Unit consists of the following 68 boundary points: Start at 427512, 2447661; 427401, 2447626; 427168, 2447697; 427158, 2447803; 427006, 2447889; 426818, 2448021; 426691, 2448046; 426610, 2448067; 426798, 2448132; 426899, 2448153; 426955, 2448021; 427229, 2448036; 427289, 2448036; 427386, 2448046; 427325, 2448122; 427325, 2448229; 427355,

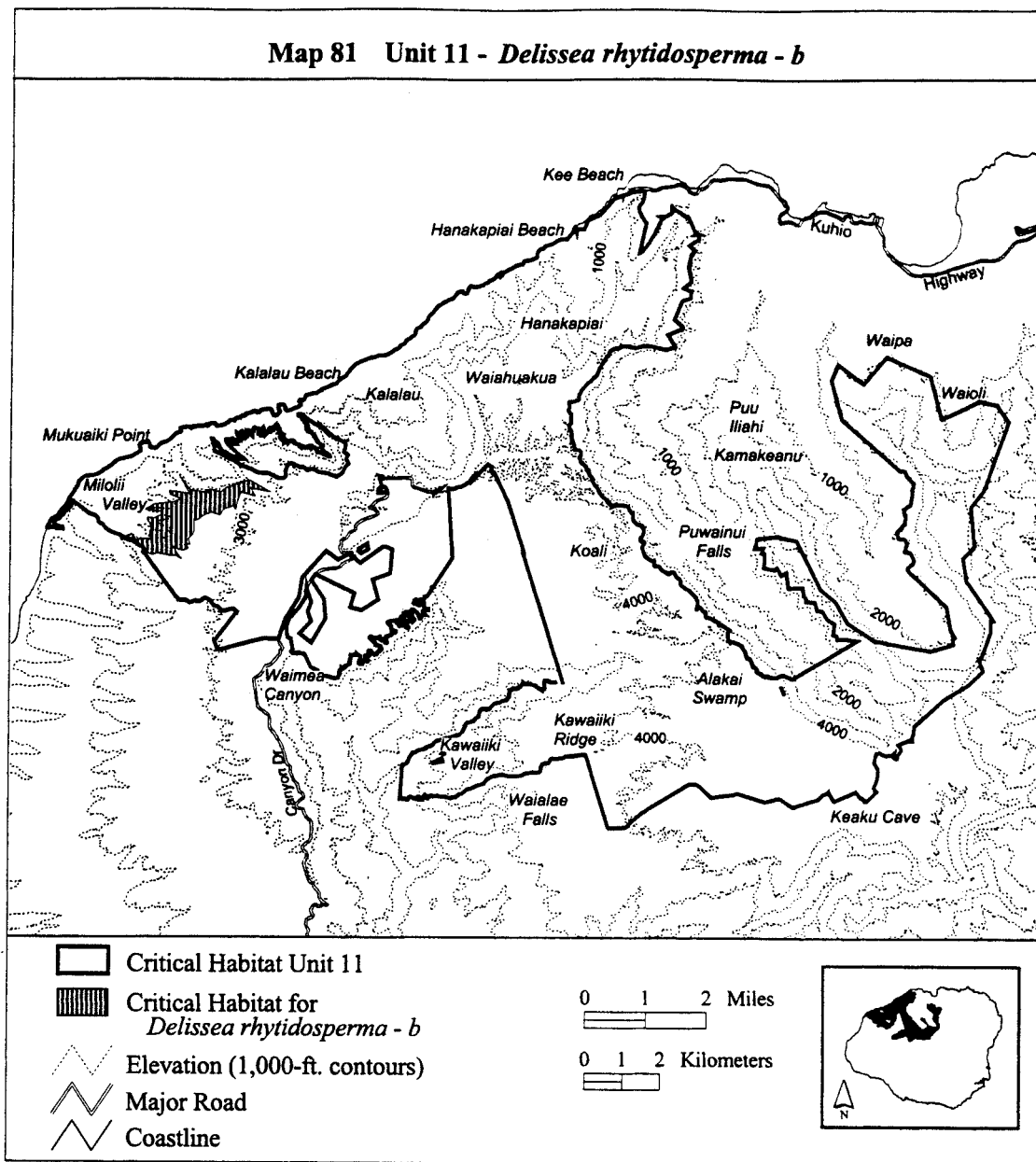
2448249; 427355, 2448360; 427300, 2448487; 427259, 2448528; 427269, 2448599; 427446, 2448578; 427558, 2448644; 427624, 2448639; 427634, 2448766; 427502, 2448766; 427208, 2448806; 427418, 2448938; 427406, 2448942; 428005, 2449021; 428147, 2449092; 427847, 2449218; 427847, 2449312; 428375, 2449234; 428131, 2449675; 428399, 2449328; 428880, 2449265; 428888, 2449352; 429187, 2449281; 429353, 2449407; 429952,

2449596; 430487, 2449296; 429983, 2449391; 430109, 2449178; 429723, 2449281; 429636, 2449029; 429597, 2448816; 429534, 2448918; 429282, 2448824; 429179, 2448666; 428958, 2448753; 428730, 2448635; 428596, 2448556; 428509, 2448525; 428496, 2448530; 428491, 2448254; 428475, 2448168; 428338, 2448036; 428389, 2447899; 428298, 2447925; 428338, 2447788; 428237, 2447742; 428115, 2447757; 427948, 2447828; 428060,

2447646; 428161, 2447535; 427999,

2447606; 427867, 2447600; return to starting point.

(B) Note: Map 81 follows:



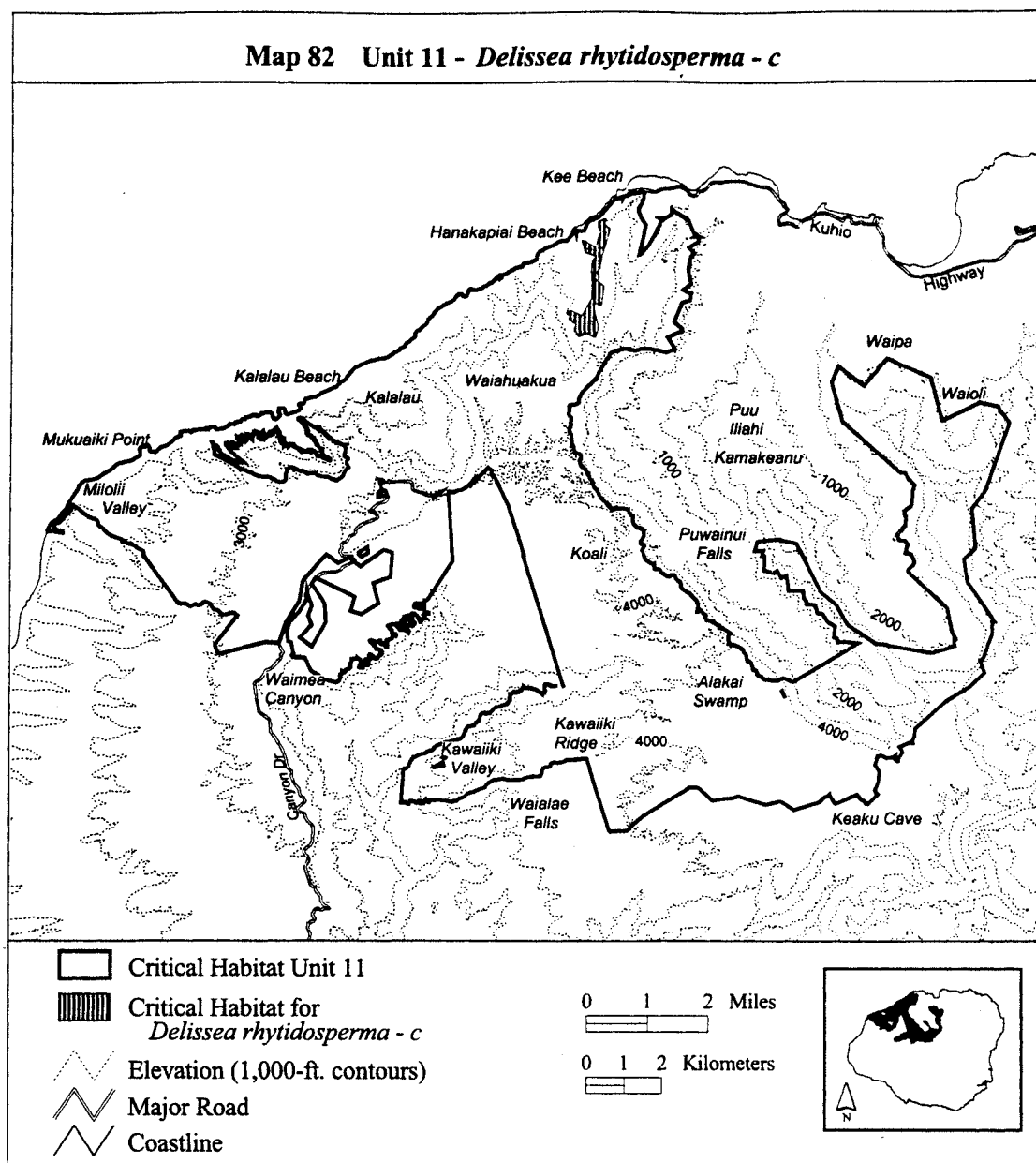
(lxxxii) Kauai 11—*Delissea rhytidosperma*—c (103 ha; 254 ac)

(A) Unit consists of the following 39 boundary points: Start at 438364, 2454097; 438437, 2454207; 438755, 2454060; 439018, 2454506; 439006, 2454940; 438994, 2455239; 439012, 2455501; 439122, 2455605; 438829,

2455709; 438743, 2456014; 438786, 2456026; 439085, 2455849; 439128, 2455935; 439177, 2456124; 439244, 2456234; 439165, 2456393; 439165, 2456515; 439361, 2456606; 439367, 2456521; 439336, 2456441; 439489, 2456325; 439275, 2455605; 439238, 2455397; 439159, 2455226; 439208, 2455062; 439153, 2454964; 439336,

2454829; 439275, 2454329; 439092, 2454390; 439067, 2454286; 439073, 2454201; 439189, 2453737; 439104, 2453474; 438878, 2453590; 438676, 2453486; 438560, 2453682; 438596, 2453822; 438413, 2453981; 438468, 2454054; return to starting point.

(B) Note: Map 82 follows:



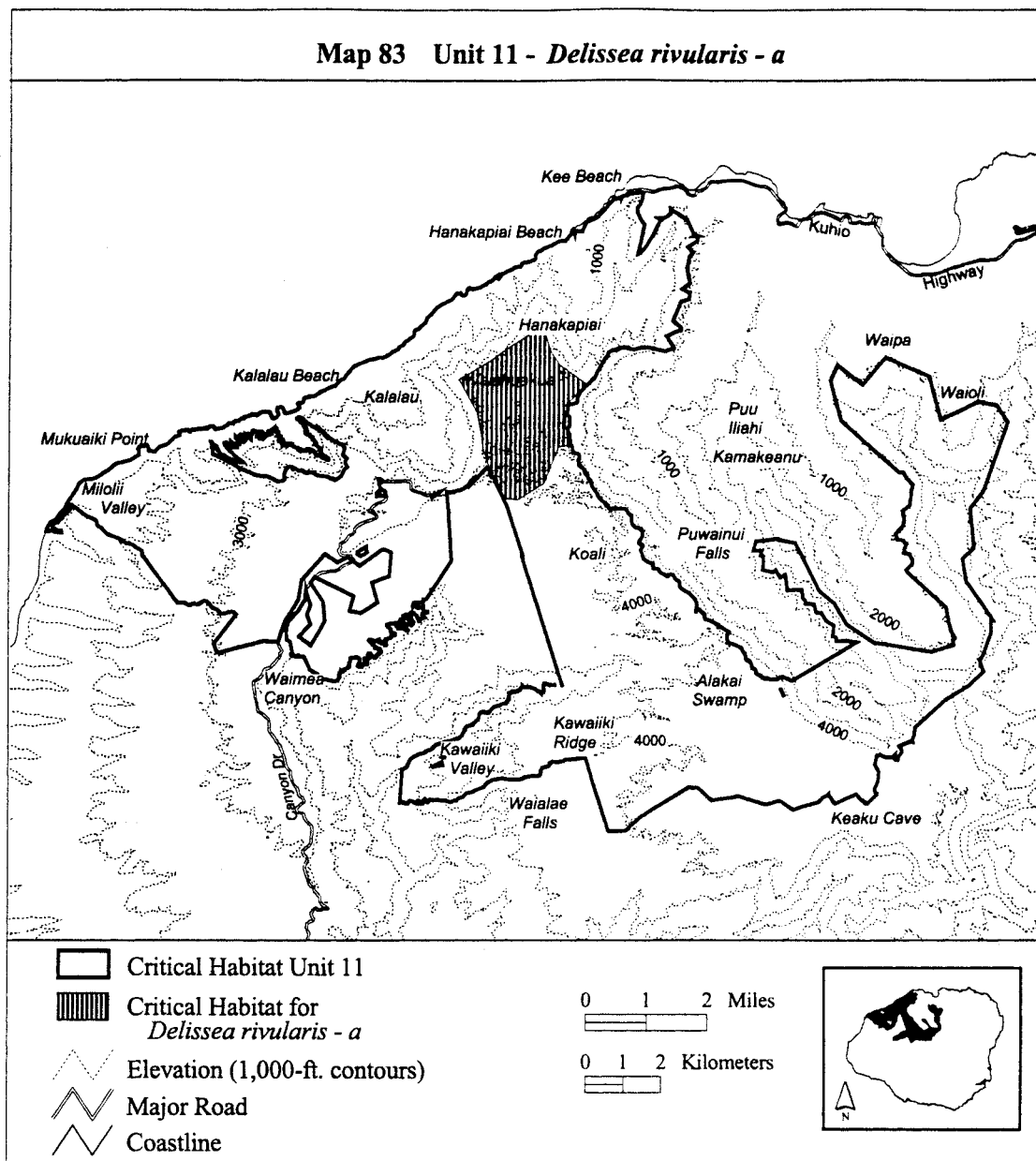
(lxxxiii) Kauai 11—*Delissea rivularis*—a (850 ha; 2,100 ac)

(A) Unit consists of the following 31 boundary points: Start at 438480, 2450624; 438190, 2450564; 438025, 2450154; 437804, 2449609; 437124, 2449170; 436726, 2449208; 436361,

2450013; 436328, 2450087; 436322, 2450079; 436197, 2450481; 436114, 2451018; 436027, 2451473; 435769, 2451955; 435533, 2452339; 435549, 2452356; 435856, 2452536; 436367, 2452827; 436965, 2453265; 437639, 2453676; 437771, 2453681; 437810,

2453604; 437963, 2453122; 438210, 2452738; 438819, 2452300; 438913, 2452214; 438478, 2451772; 438422, 2451715; 438390, 2451682; 438377, 2451065; 438401, 2450962; 438479, 2450630; return to starting point.

(B) **Note:** Map 83 follows:



(lxxxiv) Kauai 11—*Delissea undulata*—a (257 ha; 635 ac)

(A) Unit consists of the following 35 boundary points: Start at 440245, 2453335; 439623, 2453274; 439296, 2453242; 439152, 2453286; 438673, 2453669; 438255, 2454243; 438351,

2454304; 438747, 2454599; 439309, 2454708; 439737, 2454756; 440202, 2454807; 440517, 2454810; 440294, 2454127; 440499, 2454060; 440485, 2453995; 440492, 2453950; 440484, 2453922; 440461, 2453865; 440450, 2453851; 440432, 2453815; 440421, 2453780; 440412, 2453745; 440410,

2453716; 440404, 2453694; 440384, 2453655; 440378, 2453623; 440380, 2453590; 440370, 2453517; 440363, 2453496; 440355, 2453461; 440350, 2453451; 440333, 2453428; 440315, 2453408; 440288, 2453388; 440275, 2453381; return to starting point.

(B) **Note:** Map 84 follows:

Map 84 Unit 11 - *Delissea undulata* - a

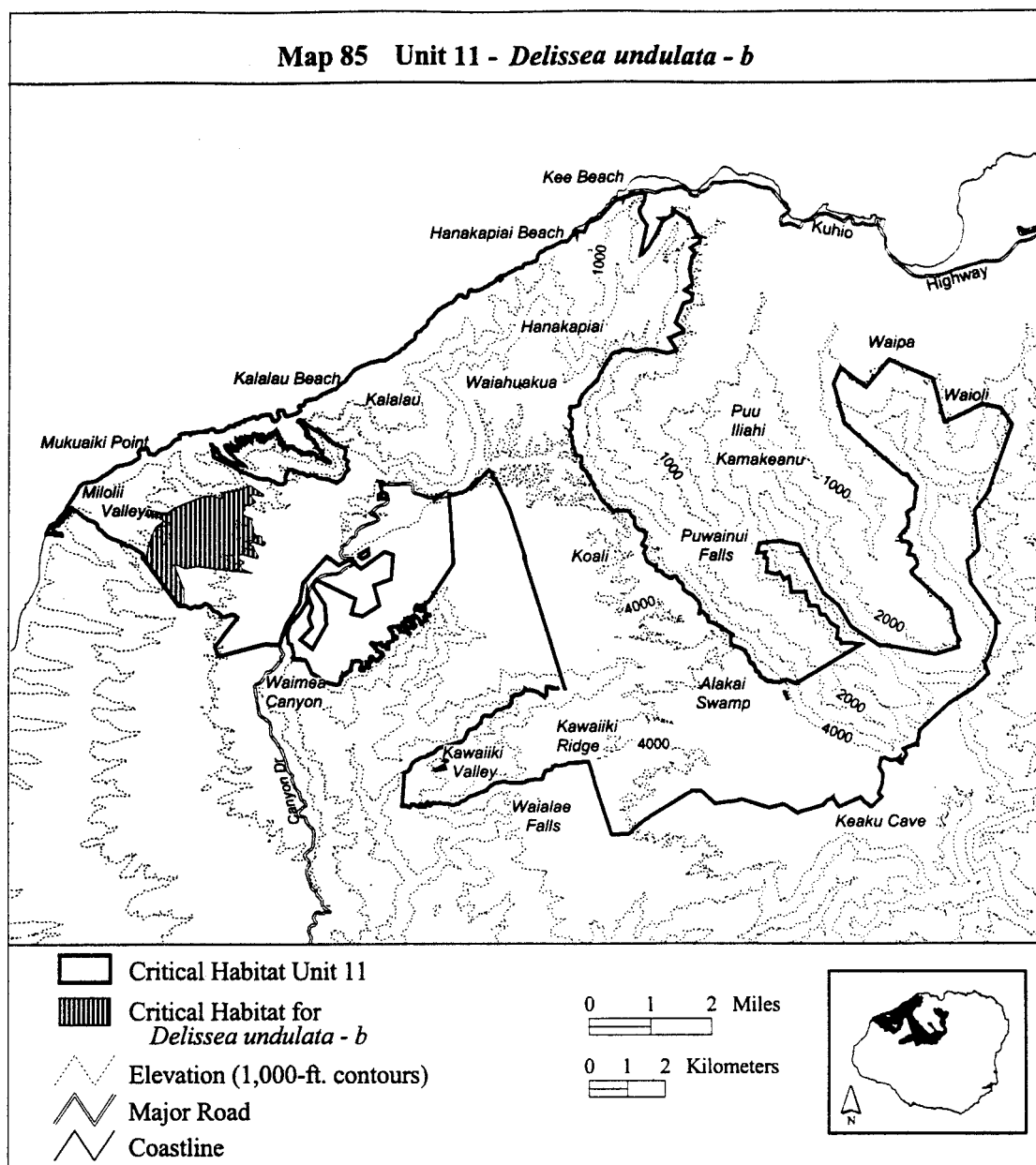
The map displays the following features and labels:

- Beaches:** Kee Beach, Hanakapiai Beach, Kalalau Beach, Mukuiaiki Point.
- Valleys:** Milolii Valley, Waimea Canyon, Kawaiiki Valley.
- Ridges and Peaks:** Waiahuakua, Puu Iliahi, Kamakeanu, Kawaiiki Ridge.
- Other Features:** Waialeale Falls, Alakai Swamp, Keaku Cave, Waipa, Waioli.
- Elevation Contours:** 1000, 2000, 3000, 4000 feet.
- Infrastructure:** Highway.
- Legend:**
 - Critical Habitat Unit 11 (solid black line)
 - Critical Habitat for *Delissea undulata* - a (hatched area)
 - Elevation (1,000-ft. contours) (dashed line)
 - Major Road (double line)
 - Coastline (solid line)
- Scale:** 0 to 2 Miles and 0 to 2 Kilometers.
- Inset Map:** Shows the location of the study area within the state of Hawaii.

(A) Unit consists of the following 90 boundary points: Start at 428237, 2446901; 428241, 2446462; 428116, 2446474; 428047, 2446484; 427205, 2447633; 427225, 2447691; 427222, 2447694; 427270, 2447855; 427313, 2448038; 427392, 2448290; 427457, 2448429; 427496, 2448503; 427596, 2448586; 427679, 2448656; 427688, 2448708; 427671, 2448747; 427596, 2448756; 427401, 2448799; 427039, 2448843; 426991, 2448882; 426969, 2448912; 426987, 2448952; 427057, 2449030; 427122, 2449004; 427666, 2448886; 427814, 2448886; 427954,

2448021; 430191, 2448063; 430076,
2448105; 429998, 2448093; 429974,
2448039; 430064, 2448003; 430076
2447949; 430203, 2447726; 430179,
2447678; 429758, 2447786; 429662,
2447744; 429692, 2447648; 429818,
2447594; 429824, 2447540; 429740,
2447522; 429722, 2447504; 429770,
2447396; 429860, 2447366; 430010,
2447294; 429000, 2447414; 428586,
2447474; 428465, 2447432; 428291,
2447414; 428039, 2447510; 427984,
2447510; 427984, 2447511; 427980,
2447502; 427934, 2447525; 427983,
2447490; 428217, 2446900; return to
starting point.

(B) **Note:** Map 85 follows:



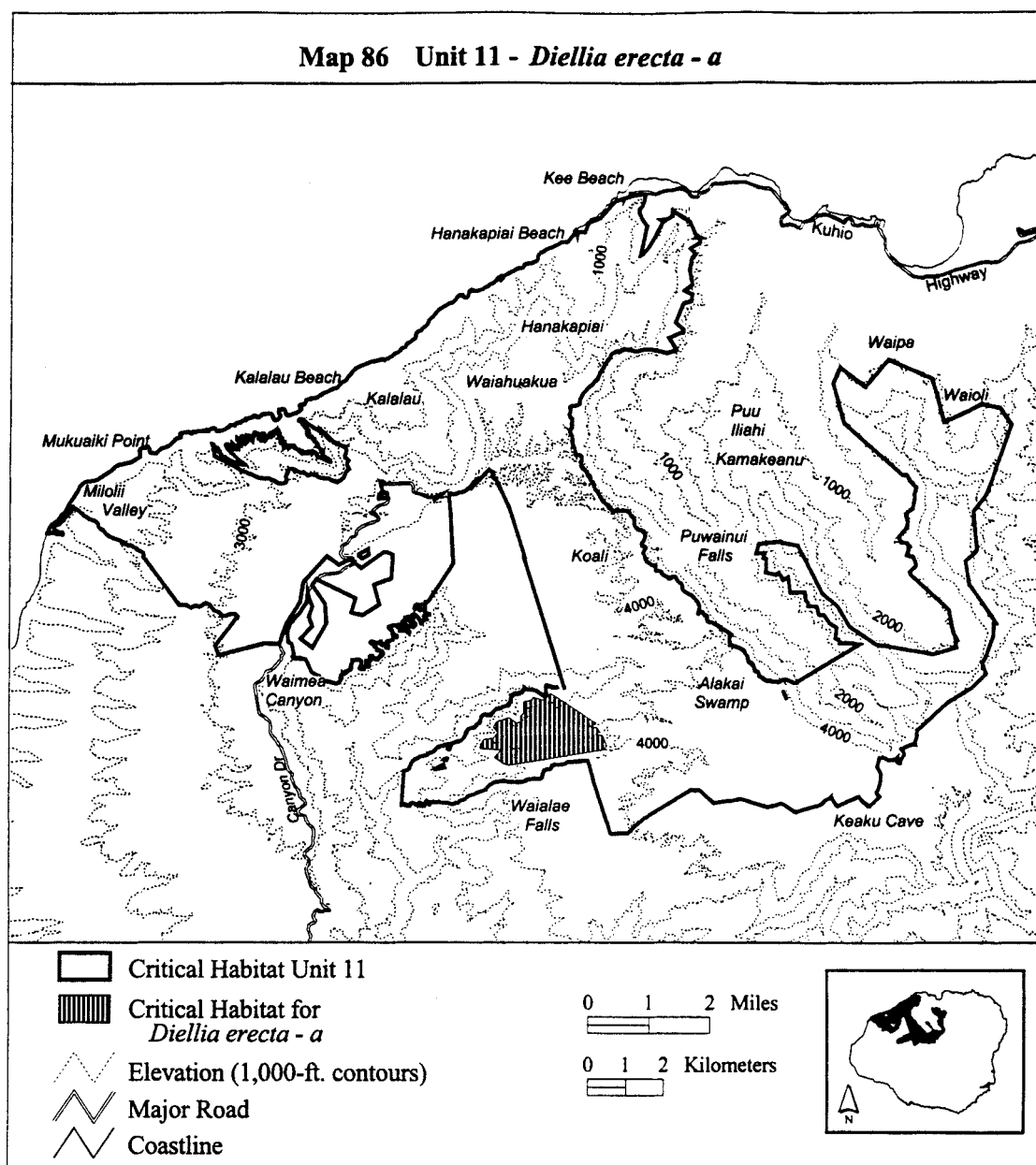
(lxxxvi) Kauai 11—*Diellia erecta*—a
(364 ha; 901 ac)

(A) Unit consists of the following 30 boundary points: Start at 437962, 2444106; 439160, 2443328; 439020, 2443250; 439191, 2443203; 439238, 2443125; 439168, 2443024; 439316,

2443017; 439440, 2442729; 439378, 2442635; 436857, 2442223; 436732, 2442270; 436483, 2442441; 436654, 2442636; 436102, 2442659; 436086, 2442721; 436188, 2442916; 436452, 2442939; 436553, 2443095; 436444, 2443235; 436522, 2443367; 436857,

2443468; 437067, 2443336; 437176, 2443359; 437160, 2443499; 437246, 2443585; 437246, 2443733; 437246, 2443888; 437479, 2443943; 437487, 2444013; 437760, 2443935; return to starting point.

(B) **Note:** Map 86 follows:



(lxxxvii) Kauai 11—*Diellia pallida*—a
(601 ha; 1,485 ac)

(A) Unit consists of the following 181 boundary points: Start at 426612, 2448093; 426664, 2448093; 426740, 2448131; 426778, 2448146; 426847, 2448184; 426900, 2448169; 426968, 2448086; 427044, 2448078; 427082, 2448063; 427143, 2448040; 427196, 2448048; 427280, 2448010; 427341, 2448010; 427402, 2448025; 427402, 2448040; 427303, 2448093; 427219, 2448169; 427227, 2448222; 427196, 2448314; 427136, 2448314; 427037, 2448359; 426999, 2448420; 427067, 2448390; 427120, 2448390; 427219, 2448405; 427288, 2448352; 427348, 2448298; 427394, 2448291; 427463, 2448268; 427599, 2448238; 427615,

2448154; 427653, 2448101; 427698, 2448048; 427729, 2448040; 427744, 2448055; 427721, 2448108; 427713, 2448146; 427774, 2448222; 427827, 2448215; 427881, 2448200; 427919, 2448200; 427852, 2448318; 427706, 2448338; 427555, 2448483; 427878, 2448586; 427308, 2448763; 427308, 2448817; 427841, 2448838; 428023, 2449021; 427927, 2449075; 427846, 2449021; 427287, 2449220; 427243, 2449338; 427421, 2449381; 427604, 2449467; 427572, 2449510; 427905, 2449553; 428050, 2449424; 427970, 2449634; 427749, 2449709; 427706, 2449768; 427841, 2449784; 428077, 2449779; 428249, 2449634; 428352, 2449494; 428448, 2449360; 428868, 2449317; 428836, 2449381; 428932,

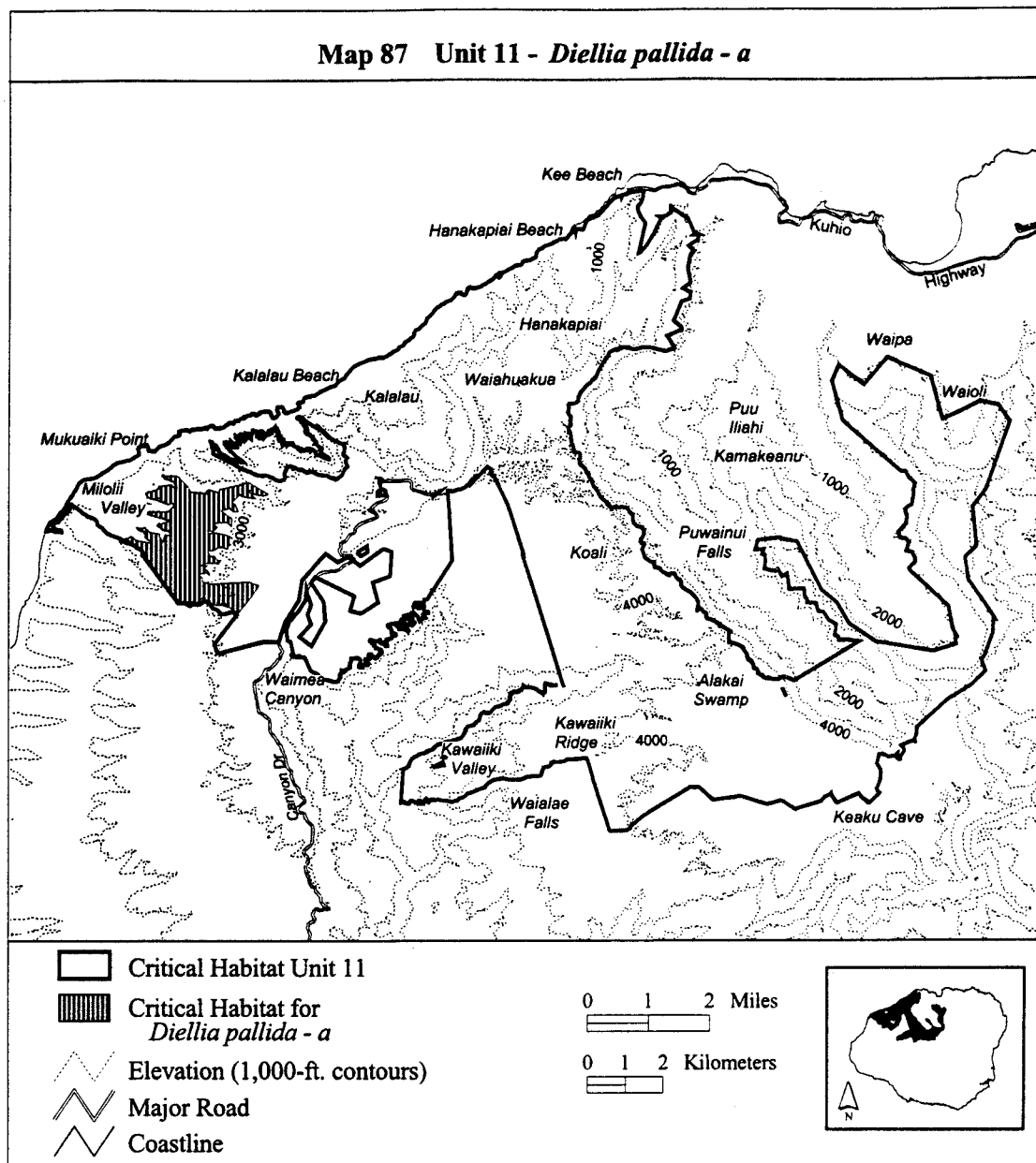
2449419; 429158, 2449338; 429196, 2449430; 429702, 2449537; 429922, 2449601; 429955, 2449612; 430471, 2449300; 430347, 2449252; 430067, 2449311; 430030, 2449397; 429955, 2449392; 430143, 2449177; 429739, 2449258; 429729, 2449301; 429508, 2449075; 429605, 2449037; 429675, 2448822; 429562, 2448817; 429465, 2448924; 429239, 2448849; 429508, 2448650; 429492, 2448446; 429406, 2448553; 429045, 2448542; 429126, 2448408; 429019, 2448317; 428868, 2448344; 428916, 2448236; 429013, 2448295; 429379, 2448214; 429675, 2448059; 429417, 2447935; 429411, 2447843; 429234, 2447908; 429226, 2447910; 429150, 2447895; 429112, 2447865; 429105, 2447827; 429014,

2447812; 428899, 2447797; 428884,
2447766; 428922, 2447721; 428945,
2447675; 428983, 2447645; 429021,
2447645; 429044, 2447683; 429067,
2447652; 429097, 2447607; 429120,
2447569; 429173, 2447538; 429242,
2447553; 429166, 2447447; 429105,
2447500; 428983, 2447470; 428960,
2447493; 428854, 2447477; 428709,
2447417; 428793, 2447417; 428869,
2447401; 428793, 2447371; 428808,
2447310; 428869, 2447295; 428915,
2447181; 428854, 2447234; 428778,

2447204; 428694, 2447204; 428641,
2447173; 428737, 2447103; 428743,
2447006; 428931, 2446939; 429484,
2446970; 429961, 2446989; 430253,
2446887; 430028, 2446579; 429664,
2446148; 429580, 2446182; 429485,
2446305; 429263, 2446389; 429094,
2446389; 428972, 2446421; 428904,
2446474; 428793, 2446542; 428740,
2446564; 428655, 2446474; 428602,
2446447; 428476, 2446463; 428396,
2446447; 428285, 2446458; 428116,
2446474; 428047, 2446484; 427185,

2447661; 427161, 2447669; 427157,
2447676; 427157, 2447711; 427175,
2447754; 427176, 2447775; 427171,
2447800; 427160, 2447815; 427124,
2447837; 427084, 2447847; 427039,
2447867; 426997, 2447892; 426981,
2447902; 426958, 2447923; 426944,
2447941; 426907, 2447965; 426847,
2447992; 426819, 2447998; 426798,
2448010; 426758, 2448005; 426737,
2448009; 426722, 2448015; 426613,
2448093; return to starting point.

(B) Note: Map 87 follows:



(lxxxviii) Kauai 11—*Diellia pallida*—b
(55 ha; 136 ac)

(A) Unit consists of the following 120
boundary points: Start at 437314,

2444224; 437517, 2444006; 437424,
2443802; 437257, 2443672; 437121,
2443437; 437053, 2443332; 436979,
2443480; 436849, 2443518; 436688,

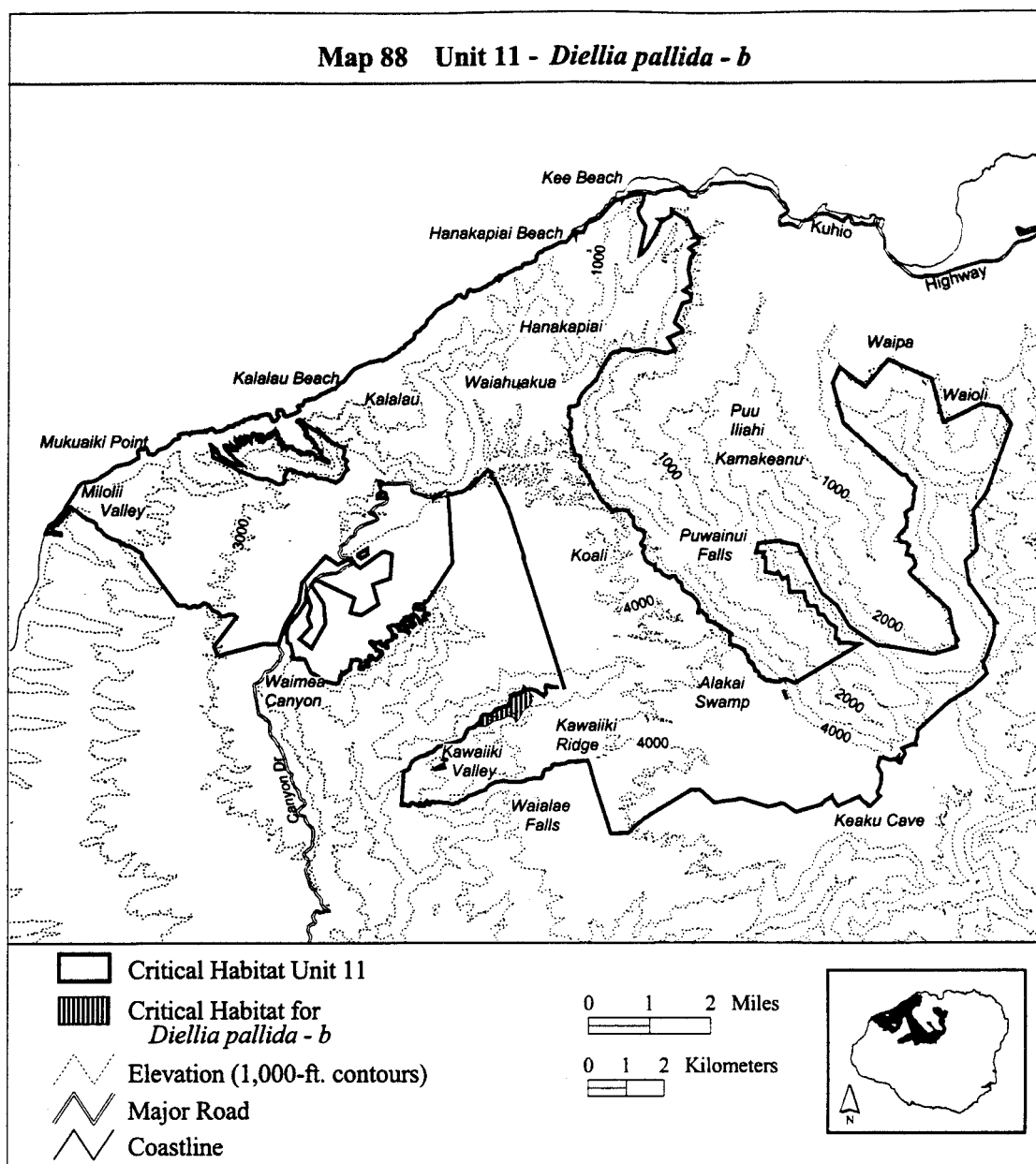
2443443; 436465, 2443375; 436280,
2443264; 435945, 2443237; 435949,
2443246; 435958, 2443255; 435969,
2443263; 435979, 2443271; 435993,

2443281; 436010, 2443297; 436032,
2443316; 436048, 2443332; 436064,
2443343; 436080, 2443358; 436089,
2443375; 436095, 2443390; 436100,
2443403; 436107, 2443421; 436113,
2443456; 436118, 2443477; 436123,
2443502; 436134, 2443520; 436146,
2443534; 436160, 2443543; 436175,
2443554; 436190, 2443560; 436213,
2443563; 436227, 2443563; 436240,
2443562; 436254, 2443557; 436265,
2443552; 436274, 2443547; 436287,
2443540; 436300, 2443537; 436315,
2443532; 436328, 2443529; 436337,
2443528; 436348, 2443531; 436357,
2443536; 436369, 2443546; 436380,
2443558; 436392, 2443572; 436403,
2443585; 436421, 2443611; 436438,

2443631; 436460, 2443655; 436478,
2443676; 436497, 2443688; 436518,
2443696; 436534, 2443700; 436558,
2443707; 436576, 2443711; 436597,
2443714; 436611, 2443716; 436630,
2443718; 436644, 2443720; 436655,
2443724; 436666, 2443731; 436678,
2443742; 436697, 2443756; 436708,
2443763; 436726, 2443769; 436745,
2443772; 436758, 2443775; 436771,
2443776; 436788, 2443776; 436799,
2443778; 436808, 2443781; 436818,
2443785; 436823, 2443786; 436829,
2443790; 436837, 2443797; 436841,
2443801; 436845, 2443807; 436852,
2443819; 436861, 2443831; 436870,
2443847; 436882, 2443863; 436890,
2443877; 436900, 2443900; 436911,

2443923; 436914, 2443936; 436914,
2443948; 436913, 2443962; 436910,
2443981; 436910, 2443981; 436979,
2444055; 437013, 2444108; 437026,
2444105; 437049, 2444100; 437067,
2444092; 437076, 2444089; 437106,
2444090; 437119, 2444096; 437128,
2444104; 437133, 2444112; 437137,
2444122; 437144, 2444130; 437156,
2444135; 437169, 2444141; 437183,
2444150; 437191, 2444154; 437202,
2444165; 437212, 2444177; 437228,
2444198; 437239, 2444213; 437245,
2444227; 437254, 2444239; 437263,
2444246; 437278, 2444240; 437294,
2444234; 437310, 2444225; return to
starting point.

(B) Note: Map 88 follows:



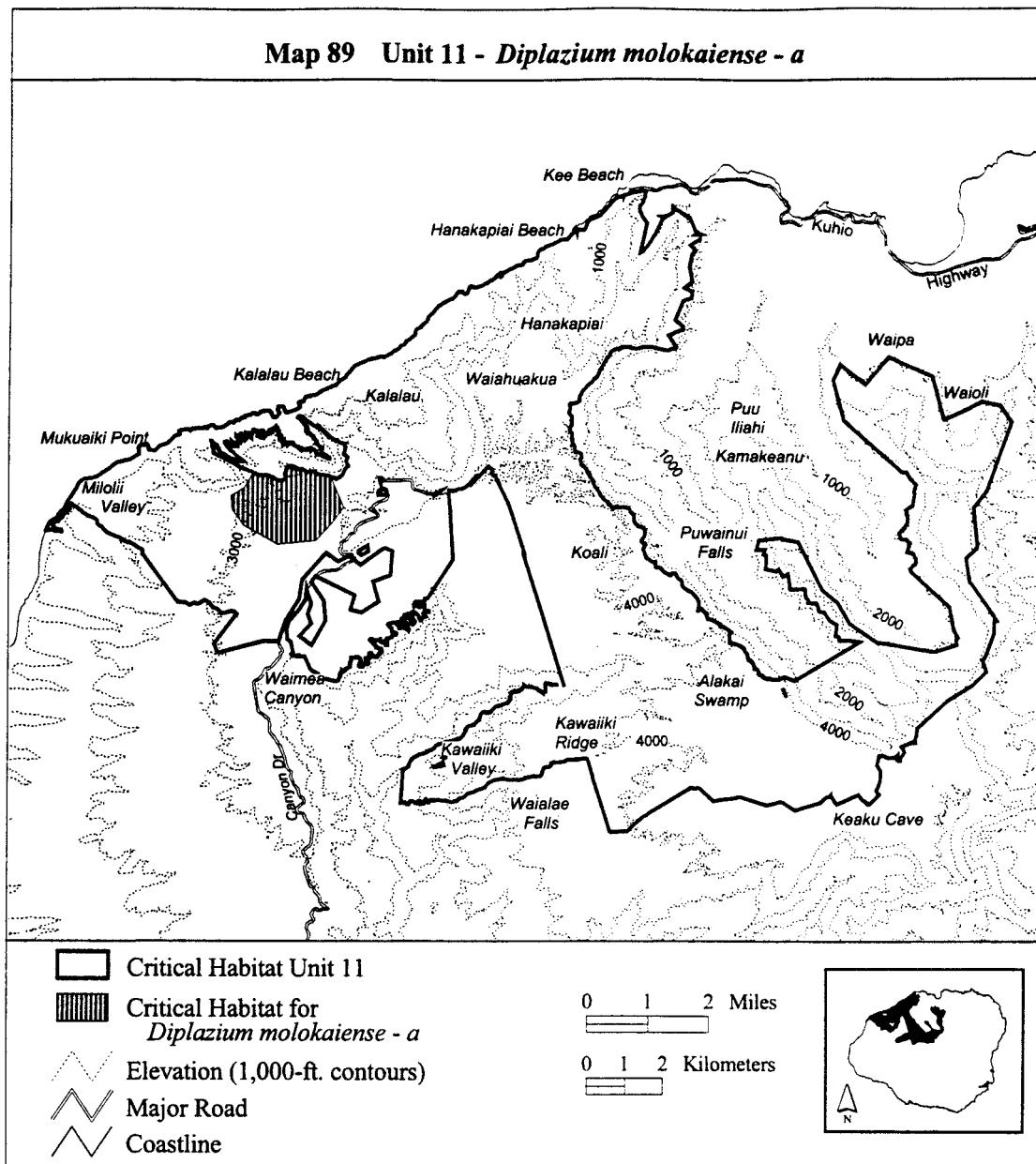
(lxxxix) Kauai 11—*Diplazium molokaiense*—a (430 ha; 1,062 ac)

(A) Unit consists of the following 48 boundary points: Start at 429805, 2448471; 429520, 2448889; 429479, 2449236; 429836, 2449450; 430021, 2449760; 430088, 2449848; 430172, 2449815; 430207, 2449804; 430261, 2449795; 430317, 2449781; 430340, 2449778; 430365, 2449787; 430392,

2449798; 430408, 2449802; 430410, 2449802; 430406, 2449796; 430471, 2449787; 430527, 2449754; 430583, 2449736; 430635, 2449693; 430696, 2449656; 430720, 2449646; 430819, 2449646; 430899, 2449674; 430918, 2449717; 430904, 2449834; 430927, 2449905; 430955, 2449985; 430993, 2450032; 431068, 2450041; 431153, 2450008; 431238, 2449970; 431285,

2449942; 431360, 2449956; 431449, 2449886; 431497, 2449867; 431605, 2449895; 431657, 2449890; 431699, 2449876; 431765, 2449810; 431864, 2449801; 431981, 2449792; 432047, 2449787; 432113, 2449740; 432456, 2448919; 432171, 2448512; 431732, 2448053; 430713, 2447962; return to starting point.

(B) Note: Map 89 follows:



(xc) Kauai 11—*Dubautia latifolia*—a (31 ha; 76 ac)

(A) Unit consists of the following 6 boundary points: Start at 432758,

2446605; 432729, 2446601; 431947, 2446508; 431624, 2446959; 431732, 2447115; 432759, 2446609; return to starting point.

(B) Note: Map 90 follows:

Map 90 Unit 11 - *Dubautia latifolia* - a

Legend:

- Critical Habitat Unit 11
- Critical Habitat for *Dubautia latifolia* - a
- Elevation (1,000-ft. contours)
- Major Road
- Coastline

Scale:

- 0 1 2 Miles
- 0 1 2 Kilometers

Inset Map:

North arrow pointing up.

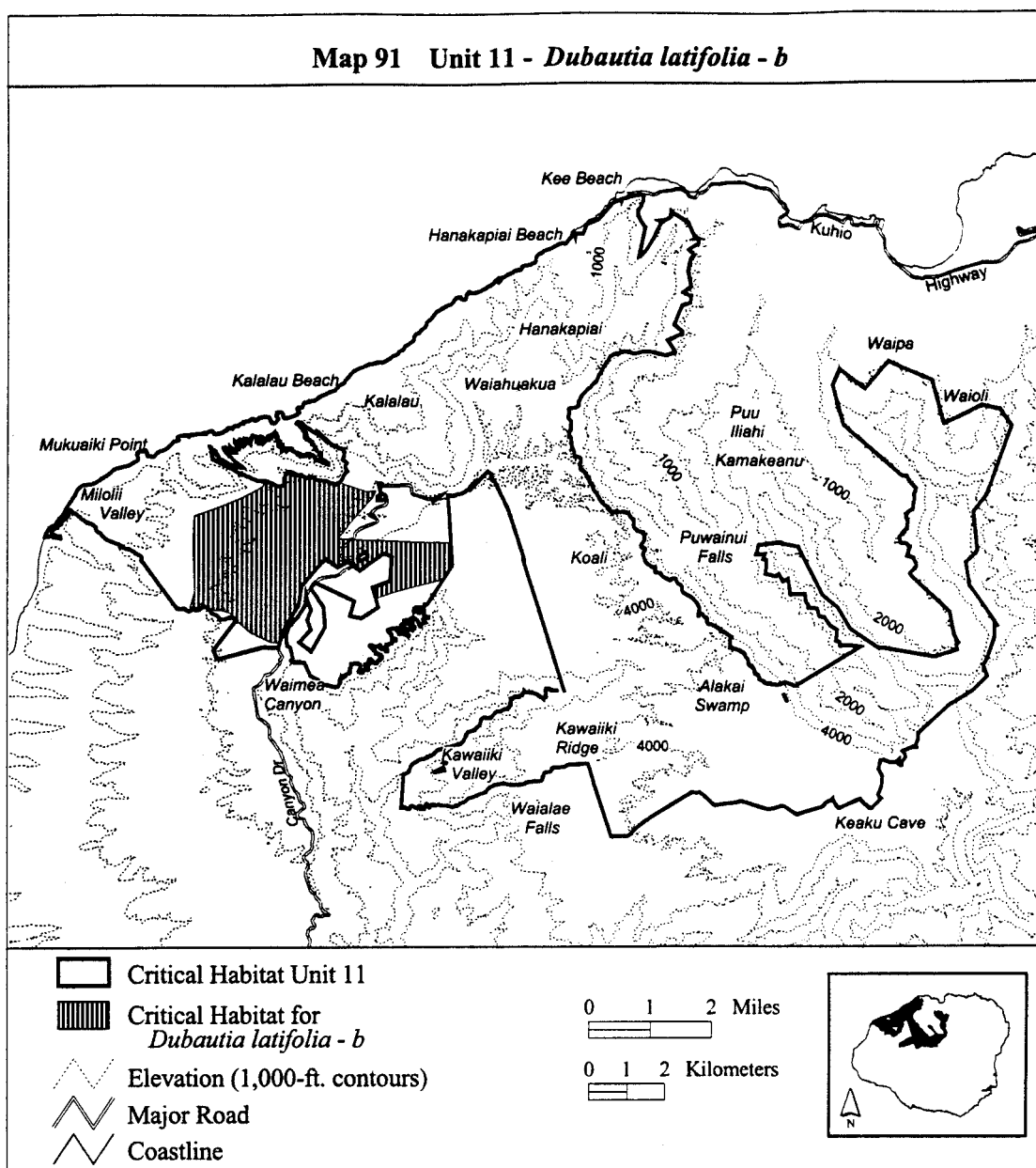
(A) Unit consists of the following 95 boundary points: Start at 431300, 2446537; 431298, 2446522; 431294, 2446516; 430955, 2445963; 430827, 2445619; 430800, 2445534; 430575, 2445540; 430038, 2445808; 429654, 2446125; 429591, 2446167; 429485, 2446305; 429263, 2446389; 429094, 2446389; 428972, 2446421; 428904, 2446474; 428793, 2446542; 428740, 2446564; 428655, 2446474; 428602, 2446447; 428476, 2446463; 428438, 2446456; 428548, 2446851; 428540, 2447350; 428511, 2448118; 428533, 2448848; 429226, 2449093; 429778, 2449324; 430158, 2449533; 430352, 2449651; 430348, 2449666; 430376,

2449750; 430384, 2449766; 430406,
2449796; 430471, 2449787; 430527,
2449754; 430583, 2449736; 430635,
2449693; 430696, 2449656; 430720,
2449646; 430819, 2449646; 430899,
2449674; 430918, 2449717; 430904,
2449834; 430927, 2449905; 430955,
2449985; 430993, 2450032; 431068,
2450041; 431153, 2450008; 431238,
2449970; 431285, 2449942; 431360,
2449956; 431449, 2449886; 431497,
2449867; 431605, 2449895; 431657,
2449890; 431699, 2449876; 431765,
2449810; 431864, 2449801; 431981,
2449792; 432047, 2449787; 432113,
2449740; 432217, 2449712; 432259,
2449679; 432344, 2449744; 432716,
2449615; 432716, 2449616; 432975,
2449532; 433094, 2449480; 433347,

2449509; 433235, 2449316; 432751,
2448757; 432364, 2448281; 432337,
2448239; 433100, 2448204; 433370,
2448192; 434350, 2448157; 435242,
2448139; 435320, 2448130; 435360,
2447538; 435147, 2447216; 435091,
2447171; 434274, 2446962; 433872,
2446863; 433405, 2446700; 433330,
2446689; 433257, 2446958; 433706,
2447138; 433746, 2447766; 433527,
2447856; 432918, 2447407; 432609,
2447647; 432320, 2447497; 432136,
2447629; 432001, 2447726; 431369,
2447027; return to starting point.

(B) Excluding 1 area bounded by the following 4 points (3 ha, 8 ac): Start at 433109, 2447775; 432932, 2447668; 432827, 2447751; 433094, 2447922; return to starting point.

(C) Note: Map 91 follows:



(xcii) Kauai 11—*Dubautia latifolia*—c
(809 ha; 1,999 ac)

(A) Unit consists of the following 263 boundary points: Start at 436896, 2441784; 437321, 2443428; 437328, 2443431; 437033, 2443650; 436902, 2443906; 436911, 2443923; 436914, 2443936; 436914, 2443948; 436913, 2443962; 436910, 2443981; 436908, 2443995; 436908, 2444013; 436911, 2444027; 436918, 2444040; 436926, 2444047; 436933, 2444055; 436942, 2444065; 436951, 2444073; 436961, 2444084; 436969, 2444094; 436975, 2444098; 436983, 2444102; 436994, 2444107; 437009, 2444108; 437026,

2444105; 437049, 2444100; 437067, 2444092; 437076, 2444089; 437106, 2444090; 437119, 2444096; 437128, 2444104; 437133, 2444112; 437137, 2444122; 437144, 2444130; 437156, 2444135; 437169, 2444141; 437183, 2444150; 437191, 2444154; 437202, 2444165; 437212, 2444177; 437228, 2444198; 437239, 2444213; 437245, 2444227; 437254, 2444239; 437263, 2444246; 437278, 2444240; 437294, 2444234; 437310, 2444225; 437332, 2444217; 437351, 2444217; 437370, 2444223; 437391, 2444223; 437412, 2444226; 437428, 2444226; 437445, 2444223; 437462, 2444219; 437482,

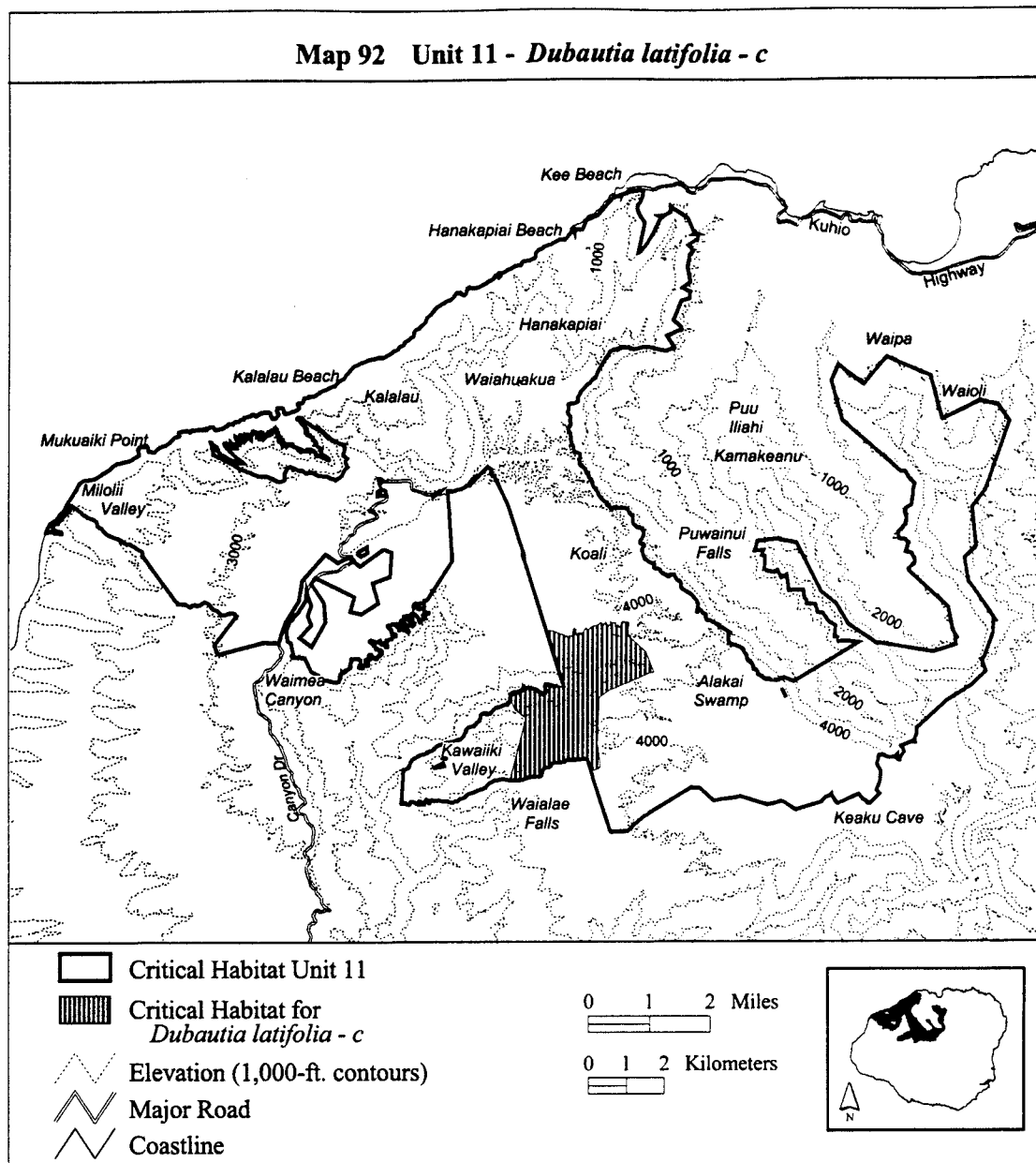
2444211; 437497, 2444205; 437541, 2444190; 437563, 2444183; 437578, 2444179; 437593, 2444170; 437610, 2444160; 437624, 2444146; 437636, 2444132; 437651, 2444119; 437671, 2444112; 437691, 2444102; 437703, 2444093; 437722, 2444082; 437732, 2444069; 437749, 2444061; 437758, 2444058; 437768, 2444060; 437780, 2444066; 437810, 2444080; 437821, 2444088; 437831, 2444100; 437833, 2444111; 437835, 2444126; 437833, 2444139; 437827, 2444102; 437822, 2444185; 437820, 2444206; 437818, 2444236; 437824, 2444265; 437828, 2444292; 437836, 2444314; 437843,

2444322; 437854, 2444327; 437871,
2444328; 437887, 2444323; 437909,
2444314; 437933, 2444302; 437960,
2444289; 437984, 2444274; 438007,
2444260; 438028, 2444258; 438048,
2444258; 438072, 2444260; 438087,
2444266; 438109, 2444271; 438133,
2444273; 438164, 2444270; 438196,
2444263; 438335, 2444214; 437851,
2445719; 438006, 2445710; 438168,
2445654; 438335, 2445593; 438342,
2445599; 438397, 2445569; 438522,
2445580; 438541, 2445610; 438552,
2445665; 438574, 2445746; 438592,
2445779; 438625, 2445761; 438633,
2445658; 438633, 2445614; 438647,
2445614; 438695, 2445639; 438721,
2445676; 438740, 2445676; 438758,
2445628; 438802, 2445647; 438839,
2445698; 438872, 2445765; 438905,
2445783; 438928, 2445776; 438931,
2445765; 438942, 2445724; 438961,
2445728; 438983, 2445765; 439020,
2445798; 439112, 2445842; 439215,
2445864; 439234, 2445879; 439274,
2445915; 439289, 2445949; 439300,
2445934; 439333, 2445879; 439363,
2445875; 439403, 2445904; 439422,
2445938; 439440, 2445934; 439436,
2445897; 439444, 2445864; 439492,

2445853; 439539, 2445871; 439539,
2445974; 439580, 2445934; 439680,
2445941; 439661, 2445860; 439694,
2445831; 439739, 2445860; 439772,
2445827; 439820, 2445842; 439838,
2445897; 439856, 2445963; 439904,
2445960; 440033, 2445941; 440026,
2445595; 440472, 2445178; 440708,
2444629; 440605, 2444611; 440155,
2444412; 439514, 2444151; 439264,
2443956; 439218, 2442724; 439294,
2442160; 439259, 2442078; 439037,
2442031; 438934, 2442351; 438866,
2442347; 438838, 2442340; 438821,
2442339; 438757, 2442331; 438721,
2442329; 438704, 2442326; 438694,
2442327; 438679, 2442324; 438656,
2442321; 438626, 2442315; 438609,
2442314; 438561, 2442316; 438535,
2442314; 438523, 2442310; 438517,
2442310; 438496, 2442310; 438460,
2442320; 438453, 2442321; 438436,
2442321; 438433, 2442319; 438418,
2442311; 438392, 2442294; 438376,
2442278; 438355, 2442265; 438305,
2442256; 438254, 2442248; 438238,
2442248; 438219, 2442244; 438157,
2442234; 438130, 2442234; 438114,
2442232; 438098, 2442237; 438065,
2442246; 438049, 2442246; 438030,

2442243; 438012, 2442229; 438000,
2442216; 437998, 2442205; 437996,
2442188; 437984, 2442167; 437973,
2442147; 437954, 2442136; 437939,
2442128; 437926, 2442125; 437912,
2442123; 437873, 2442121; 437839,
2442110; 437826, 2442106; 437806,
2442092; 437791, 2442074; 437777,
2442052; 437766, 2442017; 437758,
2441998; 437754, 2441991; 437751,
2441981; 437745, 2441950; 437740,
2441938; 437736, 2441928; 437717,
2441899; 437711, 2441887; 437705,
2441878; 437689, 2441877; 437674,
2441875; 437647, 2441866; 437635,
2441866; 437617, 2441866; 437602,
2441867; 437566, 2441876; 437532,
2441880; 437522, 2441879; 437495,
2441869; 437460, 2441862; 437391,
2441858; 437366, 2441852; 437346,
2441845; 437332, 2441842; 437317,
2441835; 437287, 2441816; 437274,
2441809; 437240, 2441796; 437224,
2441791; 437181, 2441781; 437150,
2441777; 437111, 2441777; 437096,
2441779; 437062, 2441776; 437008,
2441775; 436960, 2441776; 436912,
2441780; return to starting point.

(B) **Note:** Map 92 follows:



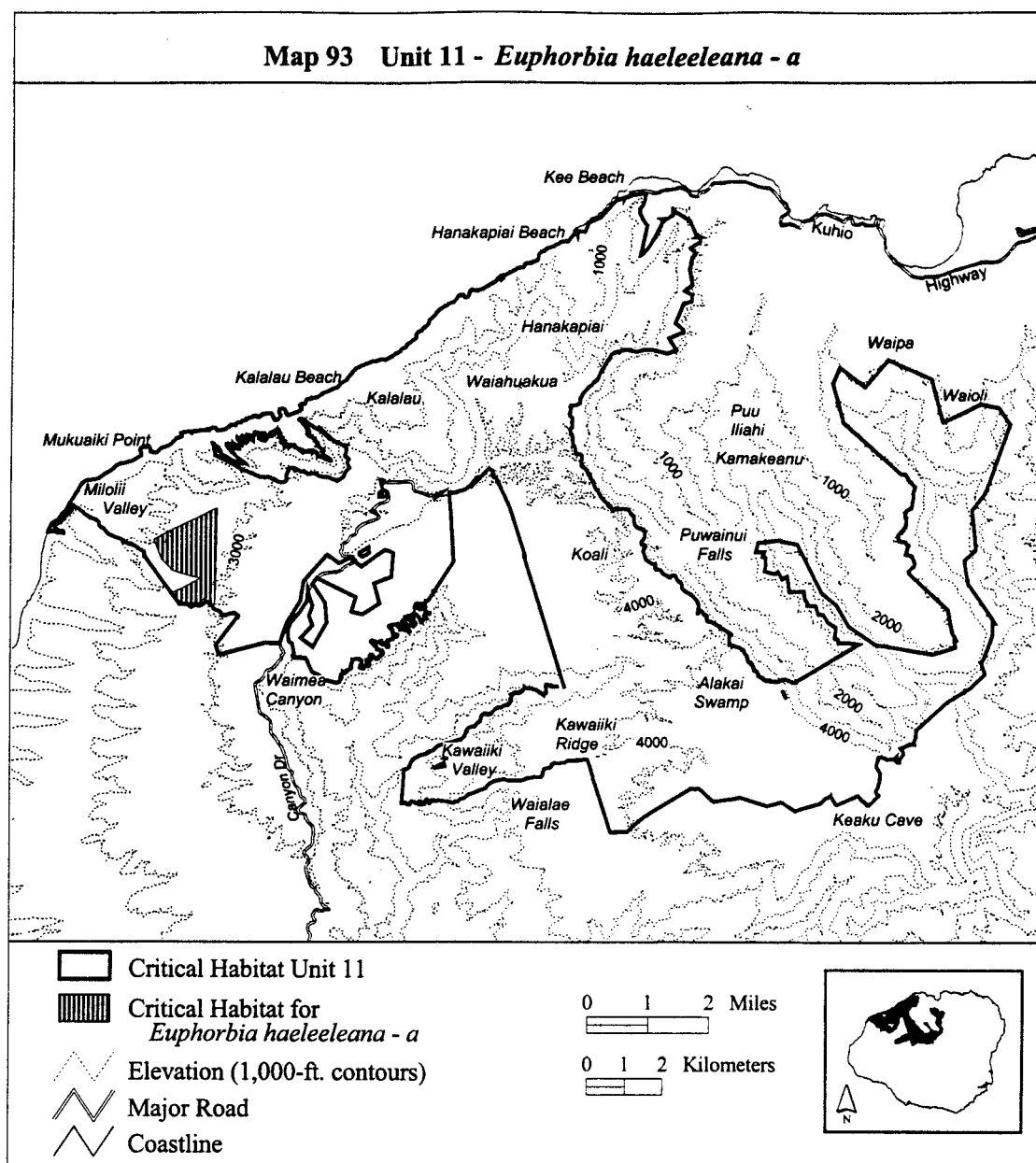
(xciii) Kauai 11—*Euphorbia haelealeana*—a (263 ha; 649 ac)

(A) Unit consists of the following 23 boundary points: Start at 429092, 2448965; 429045, 2446580; 429011,

2446411; 428972, 2446421; 428904, 2446474; 428793, 2446542; 428740, 2446564; 428655, 2446474; 428602, 2446447; 428476, 2446463; 428396, 2446447; 428285, 2446458; 428116, 2446474; 428047, 2446484; 427870,

2446726; 428195, 2446854; 428654, 2447111; 428405, 2447158; 427917, 2447317; 427606, 2447620; 427403, 2448126; 427935, 2448397; 428502, 2448676; return to starting point.

(B) **Note:** Map 93 follows:



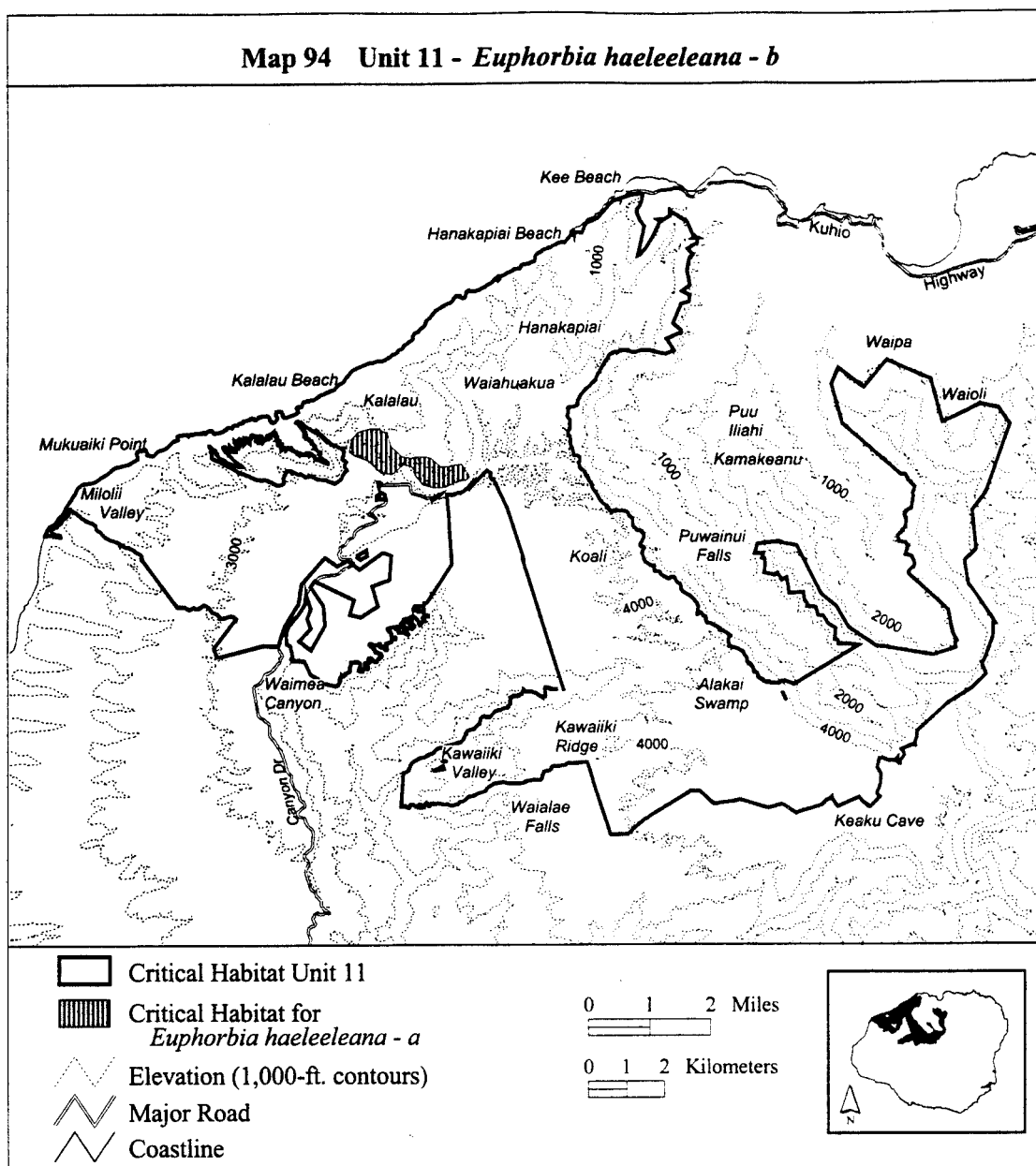
(xciv) Kauai 11—*Euphorbia haeleeleana*—b (192 ha; 476 ac)

(A) Unit consists of the following 35 boundary points: Start at 432645, 2450526; 432703, 2450873; 432886, 2451057; 433147, 2451134; 433370, 2451144; 433640, 2451018; 433737,

2450690; 434027, 2450400; 434288, 2450342; 434607, 2450400; 434801, 2450351; 434926, 2450235; 435062, 2450119; 435226, 2450119; 435458, 2450167; 435613, 2450187; 435777, 2449935; 435816, 2449848; 435748, 2449771; 435603, 2449733; 435468, 2449704; 435187, 2449569; 434888,

2449559; 434598, 2449646; 434395, 2449888; 434346, 2450061; 434279, 2450139; 434095, 2450177; 433911, 2450033; 433786, 2449917; 433505, 2449975; 433379, 2450081; 433234, 2450216; 433138, 2450294; 432770, 2450448; return to starting point.

(B) **Note:** Map 94 follows:



(xcv) Kauai 11—*Euphorbia haeleeleana*—c (204 ha; 505 ac)

(A) Unit consists of the following 270 boundary points: Start at 435336,

2442801; 435344, 2442802; 435367, 2442807; 435391, 2442814; 435415, 2442819; 435435, 2442826; 435454, 2442831; 435476, 2442838; 435496, 2442844; 435516, 2442850; 435530, 2442853; 435534, 2442855; 435543, 2442858; 435556, 2442862; 435571, 2442867; 435585, 2442876; 435598, 2442885; 435608, 2442891; 435619, 2442899; 435627, 2442904; 435642, 2442920; 435658, 2442932; 435668, 2442948; 435673, 2442959; 435681, 2442977; 435688, 2442995; 435693, 2443006; 435698, 2443024; 435704,

2443036; 435708, 2443047; 435715, 2443064; 435722, 2443078; 435725, 2443086; 435729, 2443093; 435735, 2443103; 435738, 2443112; 435743, 2443127; 435749, 2443138; 435753, 2443149; 435757, 2443155; 435766, 2443169; 435778, 2443179; 435790, 2443186; 435804, 2443188; 435821, 2443194; 435842, 2443199; 435861, 2443202; 435874, 2443204; 435889, 2443208; 435904, 2443211; 435933, 2443223; 435942, 2443232; 435949, 2443246; 435958, 2443255; 435969, 2443263; 435979, 2443271; 435993, 2443281; 436010, 2443297; 436032, 2443316; 436048, 2443332; 436064, 2443343; 436080, 2443358; 436089, 2443375; 436095, 2443390; 436100, 2443403; 436107, 2443421; 436113,

2443456; 436118, 2443477; 436123, 2443502; 436134, 2443520; 436146, 2443534; 436160, 2443543; 436175, 2443554; 436190, 2443560; 436213, 2443563; 436227, 2443563; 436240, 2443562; 436254, 2443557; 436265, 2443552; 436274, 2443547; 436287, 2443540; 436300, 2443537; 436315, 2443532; 436328, 2443529; 436337, 2443528; 436348, 2443531; 436357, 2443536; 436369, 2443546; 436380, 2443558; 436392, 2443572; 436403, 2443585; 436421, 2443611; 436438, 2443631; 436460, 2443655; 436478, 2443676; 436497, 2443688; 436518, 2443696; 436534, 2443700; 436558, 2443707; 436576, 2443711; 436597, 2443714; 436611, 2443716; 436630, 2443718; 436644, 2443720; 436655,

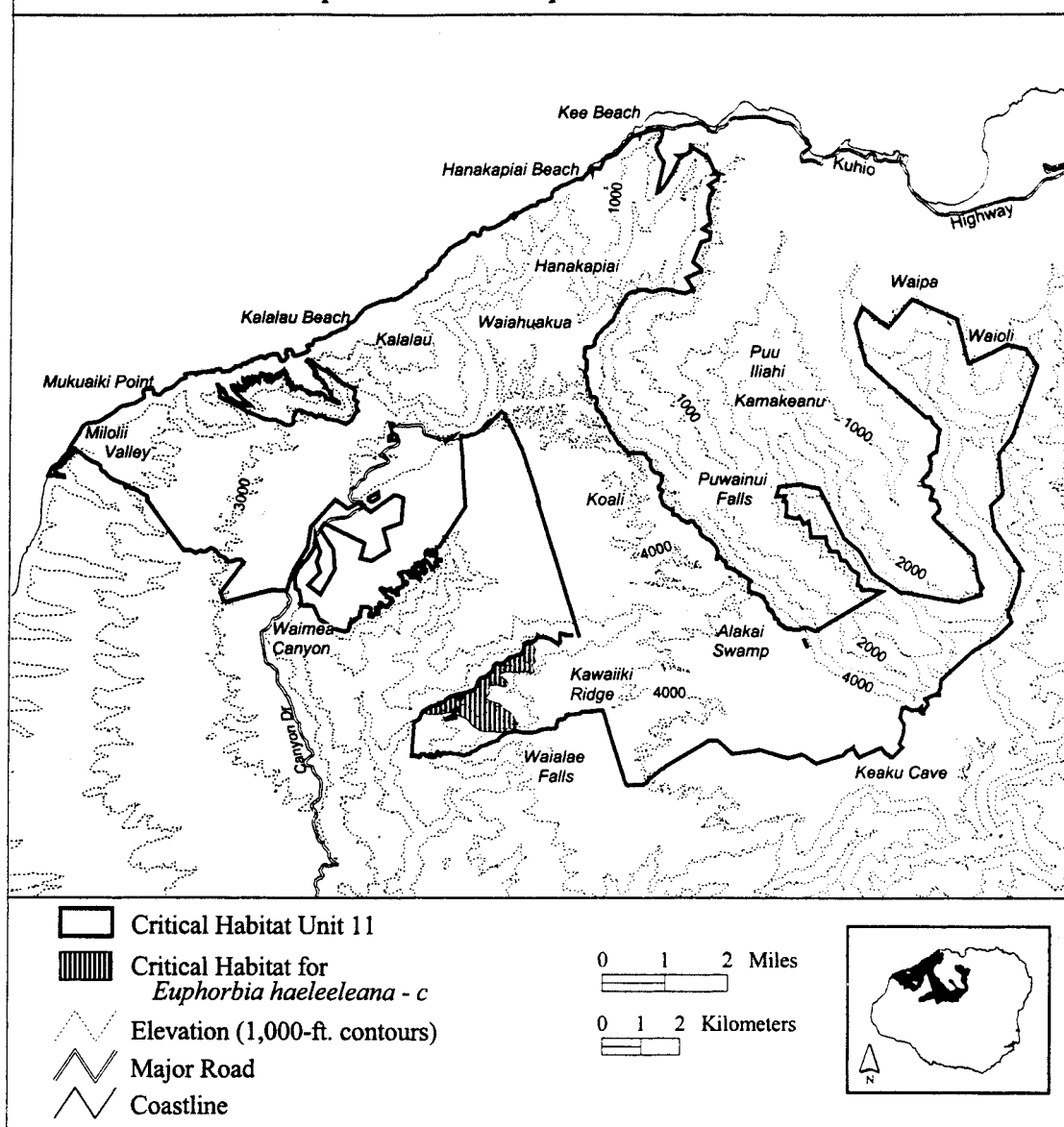
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2443847; 436882, 2443863; 436890,
2443877; 436900, 2443900; 436911,
2443923; 436914, 2443936; 436914,
2443948; 436913, 2443962; 436910,
2443981; 436908, 2443995; 436908,
2444013; 436911, 2444027; 436918,
2444040; 436926, 2444047; 436933,
2444055; 436942, 2444065; 436951,
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2443441; 437177, 2443342; 437124,
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2442248; 434484, 2442248; 434320,
2442284; 434307, 2442297; 434298,
2442319; 434308, 2442329; 434330,
2442350; 434344, 2442361; 434355,
2442368; 434370, 2442378; 434395,
2442387; 434416, 2442397; 434439,
2442410; 434458, 2442423; 434486,
2442437; 434504, 2442450; 434522,

2442454; 434537, 2442457; 434563,
2442460; 434590, 2442462; 434610,
2442464; 434628, 2442472; 434643,
2442483; 434664, 2442490; 434680,
2442493; 434700, 2442502; 434713,
2442515; 434725, 2442524; 434735,
2442532; 434755, 2442542; 434775,
2442551; 434800, 2442556; 434822,
2442562; 434842, 2442574; 434862,
2442596; 434883, 2442613; 434896,
2442626; 434916, 2442647; 434934,
2442668; 434949, 2442681; 434972,
2442699; 434986, 2442705; 434997,
2442708; 435006, 2442713; 435012,
2442717; 435026, 2442719; 435039,
2442722; 435061, 2442727; 435081,
2442733; 435100, 2442739; 435119,
2442747; 435135, 2442754; 435150,
2442764; 435164, 2442771; 435184,
2442774; 435201, 2442777; 435219,
2442778; 435237, 2442782; 435251,
2442783; 435228, 2442762; 435237,
2442643; 435284, 2442631; return to
starting point.

(B) Excluding 1 area bounded by the
following 4 points (0 ha, 1 ac): Start at
435151, 2442425; 435215, 2442393;
435195, 2442353; 435128, 2442379;
return to starting point.

(C) **Note:** Map 95 follows:

Map 95 Unit 11 - *Euphorbia haeleleana* - c

(xcvi) Kauai 11—*Exocarpos luteolus*—b
(3,799 ha; 9,387 ac)

(A) Unit consists of the following 284 boundary points: Start at 443067, 2445215; 443066, 2445209; 443066, 2445190; 443083, 2445171; 443103, 2445152; 443122, 2445132; 443135, 2445115; 443140, 2445105; 443144, 2445096; 443150, 2445078; 443152, 2445059; 443153, 2445040; 443153, 2445020; 443156, 2445003; 443158, 2444995; 443163, 2444984; 443175, 2444965; 443177, 2444962; 443193, 2444946; 443196, 2444944; 443215, 2444938; 443234, 2444932; 443240, 2444927; 443252, 2444914; 443260, 2444907; 443271, 2444898; 443281, 2444890; 443290, 2444876; 443294, 2444870; 443301, 2444851; 443307,

2444833; 443309, 2444829; 443313, 2444815; 443320, 2444796; 443327, 2444778; 443333, 2444758; 443341, 2444740; 443346, 2444728; 443352, 2444721; 443366, 2444706; 443373, 2444702; 443385, 2444699; 443403, 2444695; 443423, 2444686; 443435, 2444664; 443440, 2444655; 443443, 2444647; 443444, 2444627; 443447, 2444608; 443452, 2444591; 443459, 2444579; 443464, 2444570; 443478, 2444555; 443483, 2444551; 443497, 2444548; 443516, 2444546; 443534, 2444543; 443553, 2444537; 443557, 2444532; 443571, 2444521; 443579, 2444514; 443598, 2444493; 443610, 2444483; 443617, 2444477; 443628, 2444469; 443647, 2444460; 443666, 2444456; 443677, 2444459; 443685,

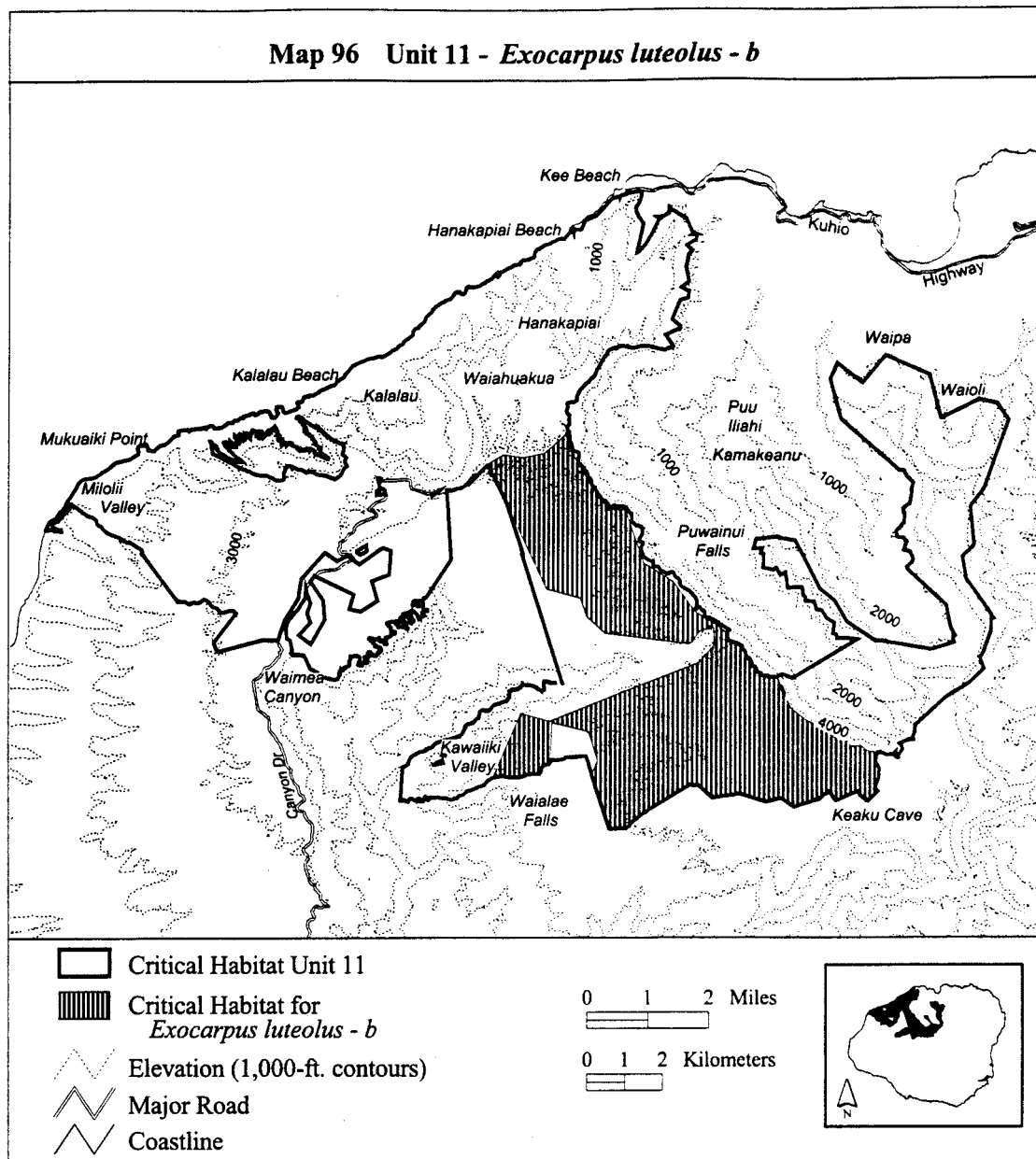
2444463; 443703, 2444469; 443722, 2444464; 443732, 2444458; 443740, 2444454; 443760, 2444446; 443769, 2444440; 443987, 2444415; 444047, 2444337; 444117, 2444107; 444210, 2443933; 444299, 2443729; 444347, 2443603; 444425, 2443555; 444600, 2443428; 444759, 2443295; 445253, 2443054; 445513, 2442838; 445854, 2442734; 445951, 2442593; 446214, 2442612; 446381, 2442489; 446652, 2442437; 446591, 2442195; 446694, 2442007; 446686, 2441764; 446640, 2441627; 446587, 2441543; 446587, 2441501; 446641, 2441436; 446651, 2441424; 446673, 2441408; 446400, 2441154; 446228, 2441279; 446214, 2441291; 446122, 2441415; 445886, 2441308; 445551, 2441162; 445510,

2441194; 445395, 2441389; 445392, 2441392; 445380, 2441414; 445344, 2441376; 444480, 2440997; 444455, 2440990; 444124, 2441223; 444113, 2441221; 444109, 2441224; 444083, 2441215; 444062, 2441230; 443889, 2441172; 443707, 2441132; 443023, 2441344; 443016, 2441342; 442976, 2441356; 442843, 2441314; 442723, 2441295; 442384, 2441249; 441968, 2441515; 441900, 2441576; 441774, 2441575; 441672, 2441599; 441656, 2441573; 441650, 2441573; 441637, 2441552; 440469, 2440833; 440464, 2440832; 440457, 2440826; 440236, 2440690; 440188, 2440625; 440119, 2440532; 440075, 2440494; 440035, 2440463; 439551, 2440431; 439093, 2441857; 439236, 2442224; 439011, 2442986; 438032, 2443222; 437997, 2442203; 437913, 2442147; 437887, 2442121; 437873, 2442121; 437839, 2442110; 437826, 2442106; 437806, 2442092; 437791, 2442074; 437777, 2442052; 437766, 2442017; 437758, 2441998; 437754, 2441991; 437751, 2441981; 437747, 2441961; 437697, 2441878; 437689, 2441877; 437674, 2441875; 437647, 2441866; 437635, 2441866; 437617, 2441866; 437602, 2441867; 437566, 2441876; 437532,

2441880; 437522, 2441879; 437495, 2441869; 437460, 2441862; 437391, 2441858; 437366, 2441852; 437346, 2441845; 437332, 2441842; 437317, 2441835; 437287, 2441816; 437274, 2441809; 437240, 2441796; 437224, 2441791; 437181, 2441781; 437150, 2441777; 437111, 2441777; 437096, 2441779; 437062, 2441776; 437008, 2441775; 436960, 2441776; 436912, 2441780; 436895, 2441784; 436825, 2441795; 436799, 2441801; 436777, 2441809; 436730, 2441820; 436695, 2441811; 436666, 2441808; 436638, 2441803; 436618, 2441796; 436593, 2441792; 436583, 2441789; 436541, 2441785; 436492, 2441773; 436474, 2441767; 437185, 2443389; 437209, 2443474; 437983, 2443266; 440213, 2444149; 441921, 2444804; 442324, 2445260; 442300, 2445723; 441960, 2445633; 441686, 2445291; 439436, 2445571; 438948, 2446021; 438786, 2446508; 437886, 2446746; 436739, 2449180; 436361, 2450013; 436335, 2450071; 436340, 2450096; 436658, 2450273; 436694, 2450293; 436737, 2450317; 437249, 2450242; 437337, 2450259; 437337, 2450259; 437824, 2450354; 437835, 2450364; 437999, 2450507; 438000, 2450508; 438124,

2450616; 438399, 2450871; 438418, 2450889; 438479, 2450630; 438530, 2450411; 438960, 2449644; 438961, 2449642; 438964, 2449637; 439170, 2449270; 439197, 2449222; 439463, 2448950; 439523, 2448880; 439531, 2448880; 439559, 2448851; 439829, 2448862; 439943, 2448855; 439948, 2448855; 439955, 2448835; 440448, 2447444; 441222, 2446944; 441810, 2446157; 442167, 2445934; 442409, 2445783; 442668, 2445560; 442673, 2445515; 442668, 2445494; 442667, 2445490; 442671, 2445471; 442675, 2445453; 442682, 2445433; 442689, 2445419; 442694, 2445414; 442709, 2445399; 442727, 2445386; 442743, 2445378; 442747, 2445377; 442765, 2445370; 442785, 2445364; 442798, 2445359; 442804, 2445357; 442821, 2445353; 442842, 2445347; 442858, 2445342; 442862, 2445341; 442877, 2445336; 442898, 2445330; 442915, 2445323; 442934, 2445314; 442952, 2445303; 442956, 2445301; 442972, 2445292; 442981, 2445284; 442990, 2445276; 443006, 2445268; return to starting point.

(B) **Note:** Map 96 follows:



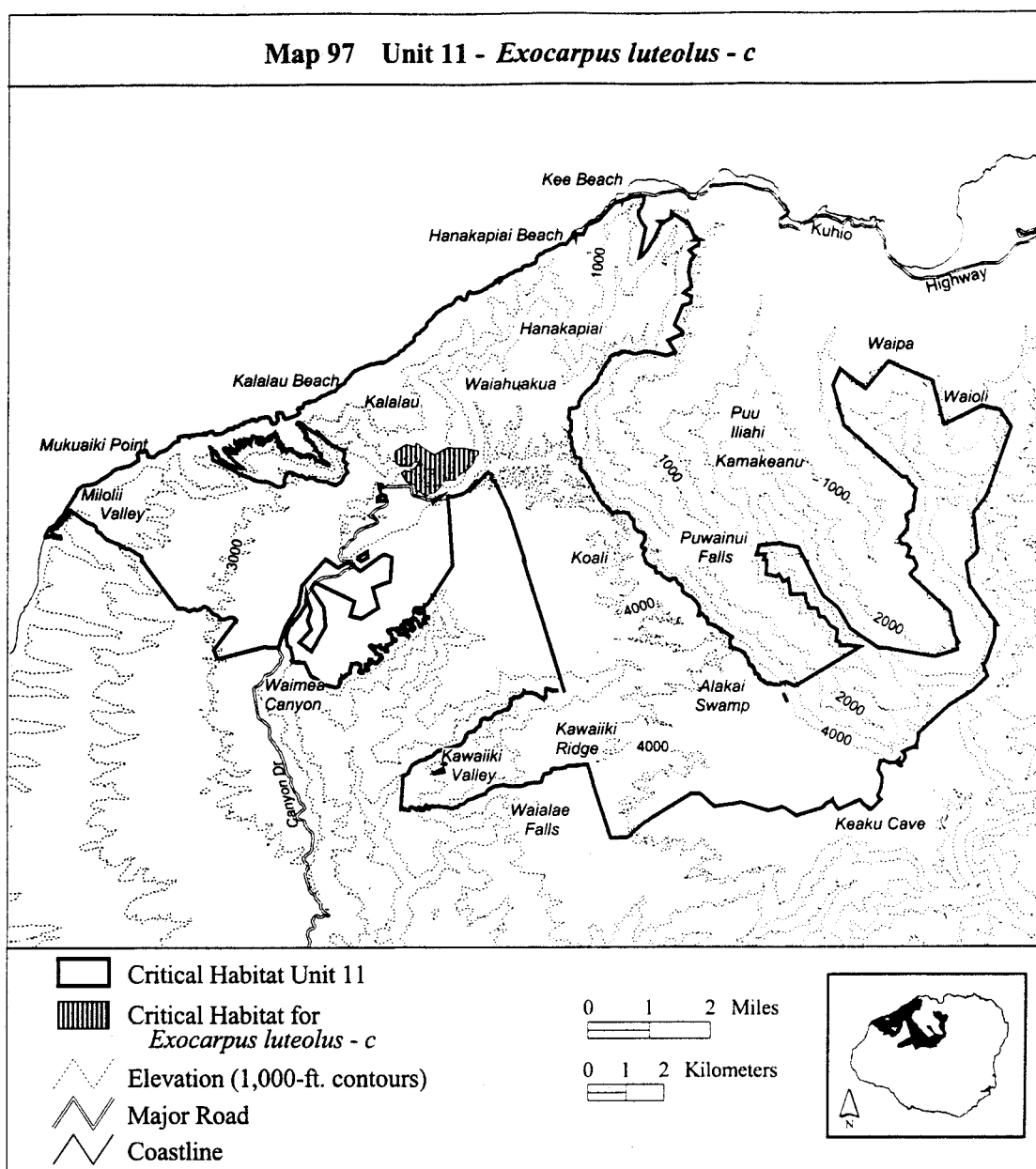
(xcvii) Kauai 11—*Exocarpus luteolus*—c
(177 ha; 438 ac)

(A) Unit consists of the following 38 boundary points: Start at 435446, 2449836; 435434, 2449822; 435414, 2449822; 435150, 2449822; 435055, 2449650; 434888, 2449475; 434758, 2449469; 434652, 2449371; 434451,

2449532; 434408, 2449452; 434362, 2449581; 434342, 2449704; 434239, 2449705; 434124, 2449782; 434000, 2449989; 434081, 2450086; 434224, 2450046; 434405, 2450190; 434405, 2450226; 434486, 2450310; 434354, 2450310; 434265, 2450198; 434026, 2450187; 433839, 2450267; 433808, 2450497; 433845, 2450589; 434133,

2450756; 434359, 2450700; 434398, 2450813; 434864, 2450480; 435213, 2450674; 435667, 2450661; 436040, 2450572; 436040, 2450490; 435945, 2450427; 435907, 2450263; 435749, 2450093; 435554, 2449961; return to starting point.

(B) **Note:** Map 97 follows:



(xcviii) Kauai 11—*Exocarpos luteolus*—
d (83 ha; 206 ac)

(A) Unit consists of the following 185
boundary points: Start at 434845,

2446760; 434768, 2446801; 434674,
2446862; 434650, 2446703; 434674,
2446584; 434706, 2446552; 434700,
2446542; 434681, 2446520; 434675,
2446517; 434664, 2446523; 434636,
2446529; 434623, 2446526; 434620,
2446512; 434628, 2446479; 434625,
2446467; 434618, 2446459; 434582,
2446443; 434558, 2446439; 434533,
2446441; 434514, 2446449; 434500,
2446448; 434471, 2446422; 434457,
2446416; 434447, 2446420; 434434,
2446428; 434423, 2446441; 434416,
2446441; 434403, 2446435; 434400,

2446429; 434386, 2446417; 434371,
2446414; 434363, 2446417; 434355,
2446417; 434351, 2446414; 434333,
2446375; 434335, 2446361; 434340,
2446352; 434353, 2446346; 434368,
2446352; 434403, 2446359; 434411,
2446354; 434417, 2446344; 434421,
2446327; 434434, 2446306; 434469,
2446291; 434479, 2446288; 434499,
2446297; 434514, 2446317; 434528,
2446325; 434559, 2446322; 434568,
2446320; 434585, 2446324; 434595,
2446329; 434614, 2446349; 434620,
2446349; 434621, 2446342; 434611,
2446321; 434609, 2446262; 434614,
2446240; 434625, 2446221; 434647,
2446210; 434667, 2446205; 434694,
2446206; 434717, 2446208; 434723,
2446192; 434729, 2446169; 434717,

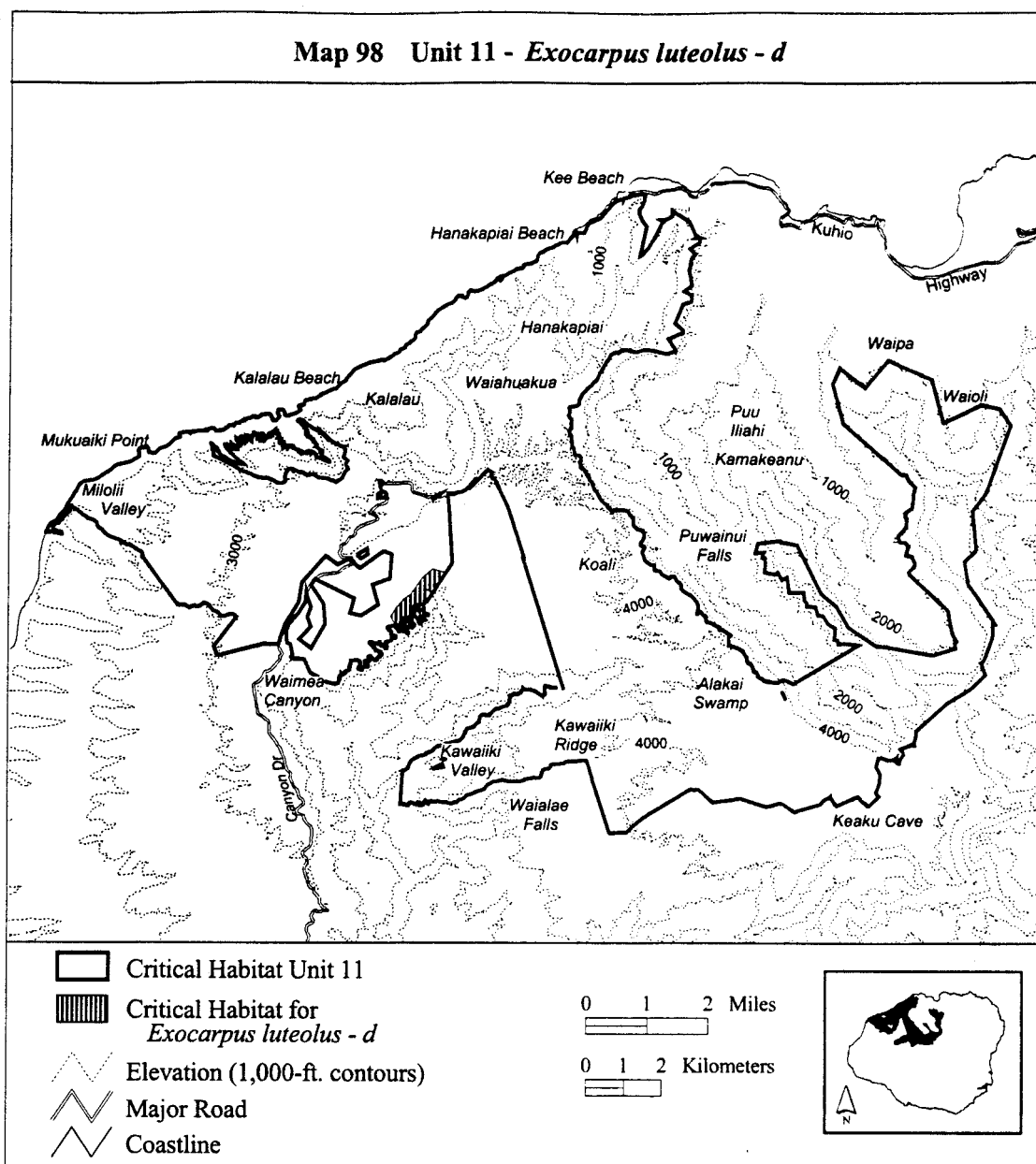
2446164; 434599, 2446152; 434582,
2446145; 434576, 2446128; 434582,
2446114; 434603, 2446087; 434642,
2446062; 434647, 2446055; 434645,
2446046; 434604, 2446029; 434573,
2446022; 434556, 2446012; 434542,
2445989; 434482, 2445992; 434482,
2445989; 434477, 2446004; 434469,
2446036; 434437, 2446093; 434413,
2446116; 434381, 2446163; 434367,
2446175; 434336, 2446186; 434315,
2446192; 434302, 2446189; 434283,
2446179; 434270, 2446164; 434263,
2446144; 434271, 2446125; 434305,
2446079; 434308, 2446060; 434307,
2446049; 434301, 2446035; 434289,
2446026; 434273, 2446018; 434244,
2446023; 434235, 2446033; 434230,
2446049; 434232, 2446066; 434225,

2446086; 434215, 2446102; 434204,
2446112; 434185, 2446122; 434162,
2446123; 434150, 2446121; 434115,
2446106; 434097, 2446102; 434080,
2446091; 434072, 2446078; 434077,
2446064; 434091, 2446053; 434110,
2446044; 434160, 2446032; 434179,
2446026; 434195, 2446010; 434209,
2445991; 434227, 2445977; 434247,
2445969; 434271, 2445965; 434324,
2445970; 434336, 2445961; 434340,
2445952; 434341, 2445940; 434355,
2445930; 434361, 2445922; 434358,
2445902; 434337, 2445880; 434326,

2445859; 434311, 2445845; 434298,
2445842; 434283, 2445847; 434262,
2445859; 434230, 2445868; 434184,
2445859; 434167, 2445860; 434147,
2445871; 434110, 2445908; 434089,
2445947; 434074, 2445985; 434062,
2445995; 434039, 2446003; 434031,
2446004; 434014, 2445998; 434001,
2445989; 433994, 2445980; 434002,
2445963; 434016, 2445942; 434022,
2445924; 434035, 2445898; 434077,
2445846; 434186, 2445754; 434202,
2445733; 434205, 2445721; 434204,
2445697; 434190, 2445688; 434158,

2445694; 434142, 2445707; 434130,
2445726; 434108, 2445744; 434086,
2445750; 434053, 2445750; 434008,
2445764; 433994, 2445763; 433947,
2445788; 433945, 2445790; 433946,
2445837; 433944, 2445864; 433927,
2445891; 433905, 2445911; 433891,
2445905; 433882, 2445891; 433879,
2445879; 433845, 2445926; 433743,
2446143; 433882, 2446368; 434094,
2446596; 434249, 2446723; 434580,
2447160; 434858, 2447393; 435197,
2447292; return to starting point.

(B) Note: Map 98 follows:



(xcix) Kauai 11—*Exocarpos luteolus*—e
(523 ha; 1,290 ac)

(A) Unit consists of the following 153
boundary points: Start at 431279,

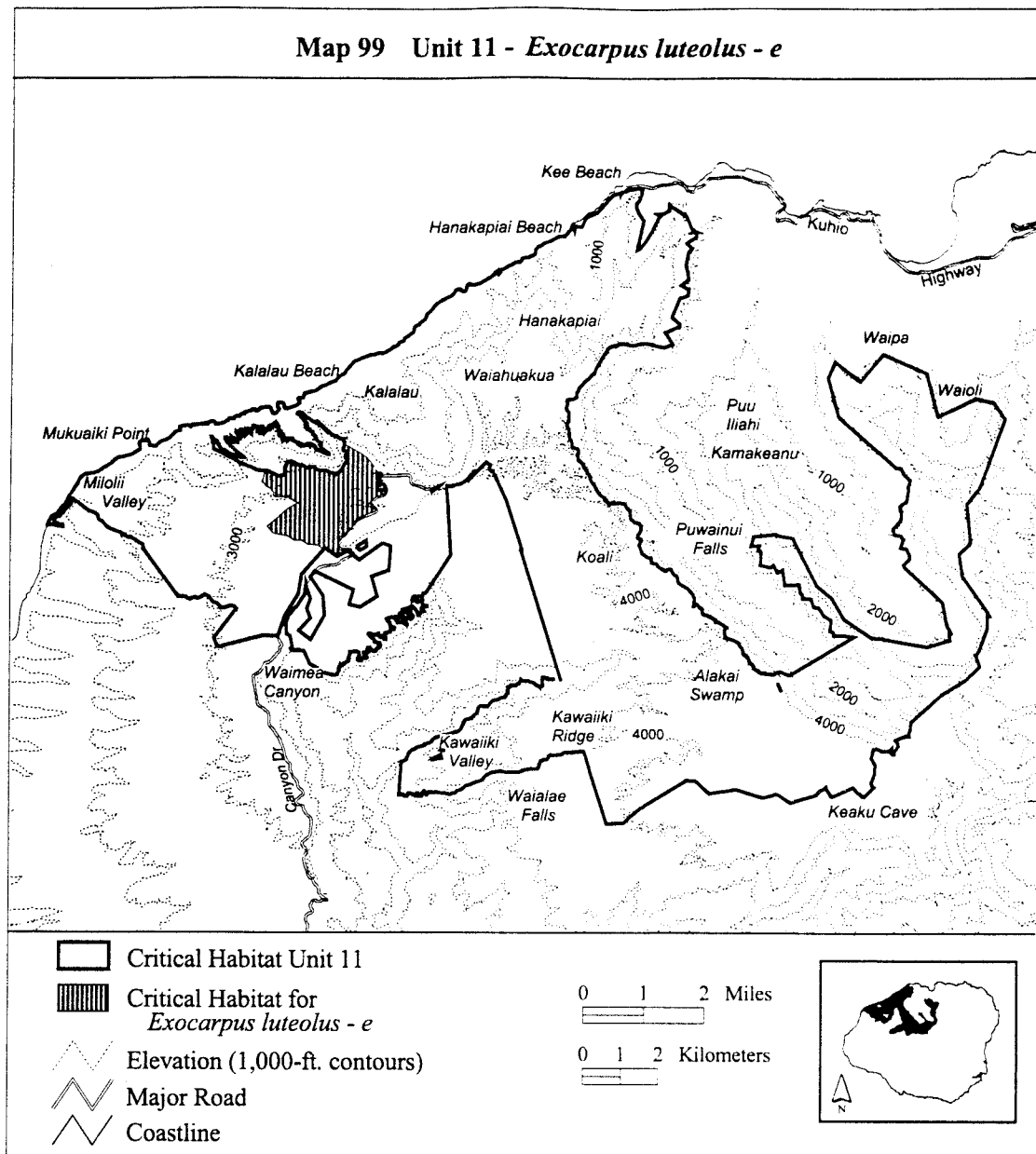
2448913; 431273, 2448922; 431027,
2449068; 431020, 2449089; 431006,
2449097; 430984, 2449094; 430970,
2449080; 430815, 2449080; 430799,
2449081; 430797, 2449080; 430686,
2449080; 430677, 2449084; 430643,
2449106; 430629, 2449119; 430619,
2449138; 430616, 2449156; 430623,
2449173; 430623, 2449194; 430616,
2449214; 430604, 2449229; 430559,
2449254; 430545, 2449277; 430533,
2449310; 430527, 2449321; 430485,
2449333; 430474, 2449342; 430463,
2449355; 430451, 2449363; 430430,
2449364; 430437, 2449371; 430418,
2449395; 430369, 2449433; 430355,
2449451; 430349, 2449466; 430335,
2449474; 430318, 2449477; 430307,
2449482; 430312, 2449517; 430313,
2449532; 430320, 2449553; 430331,
2449565; 430346, 2449596; 430354,
2449622; 430355, 2449641; 430348,
2449666; 430376, 2449750; 430384,
2449766; 430406, 2449796; 430471,
2449787; 430527, 2449754; 430583,
2449736; 430635, 2449693; 430696,

2449656; 430720, 2449646; 430819,
2449646; 430899, 2449674; 430918,
2449717; 430904, 2449834; 430927,
2449905; 430955, 2449985; 430993,
2450032; 431068, 2450041; 431153,
2450008; 431238, 2449970; 431285,
2449942; 431360, 2449956; 431449,
2449886; 431497, 2449867; 431605,
2449895; 431657, 2449890; 431699,
2449876; 431765, 2449810; 431864,
2449801; 431981, 2449792; 432047,
2449787; 432113, 2449740; 432217,
2449712; 432259, 2449679; 432344,
2449744; 432419, 2449806; 432471,
2449904; 432504, 2449961; 432579,
2450036; 432551, 2450083; 432523,
2450130; 432523, 2450182; 432565,
2450262; 432523, 2450304; 432475,
2450313; 432452, 2450337; 432461,
2450375; 432480, 2450426; 432490,
2450478; 432501, 2450529; 432504,
2450523; 432515, 2450503; 432523,
2450483; 432671, 2450388; 432937,
2450257; 433110, 2450122; 433260,
2449930; 433339, 2449809; 433405,
2449720; 433407, 2449708; 433399,
2449709; 433419, 2449599; 433426,
2449556; 433437, 2449592; 433549,
2449510; 433671, 2449267; 433615,
2449141; 433358, 2449090; 433236,

2448950; 433199, 2448903; 433176,
2448898; 433386, 2448749; 433344,
2448697; 433119, 2448609; 432890,
2448469; 432746, 2448300; 432657,
2448221; 432521, 2448030; 432395,
2447960; 432395, 2447894; 432372,
2447829; 432381, 2447775; 432386,
2447745; 432456, 2447707; 432610,
2447684; 432685, 2447670; 432661,
2447623; 432720, 2447605; 432719,
2447599; 432672, 2447598; 432609,
2447647; 432507, 2447594; 432195,
2447587; 432136, 2447629; 432001,
2447726; 431937, 2447655; 431895,
2447735; 431816, 2447810; 431535,
2447815; 431395, 2447918; 431213,
2447932; 430998, 2448049; 430820,
2448072; 430610, 2448119; 430460,
2448306; 430741, 2448535; 430998,
2448759; 431263, 2448926; 431275,
2448914; return to starting point.

(B) Excluding 1 area bounded by the
following 10 points (3 ha, 8 ac): Start at
433368, 2449292; 433367, 2449352;
433448, 2449426; 433546, 2449412;
433567, 2449398; 433589, 2449323;
433612, 2449262; 433588, 2449244;
433567, 2449260; 433369, 2449255;
return to starting point.

(C) **Note:** Map 99 follows:



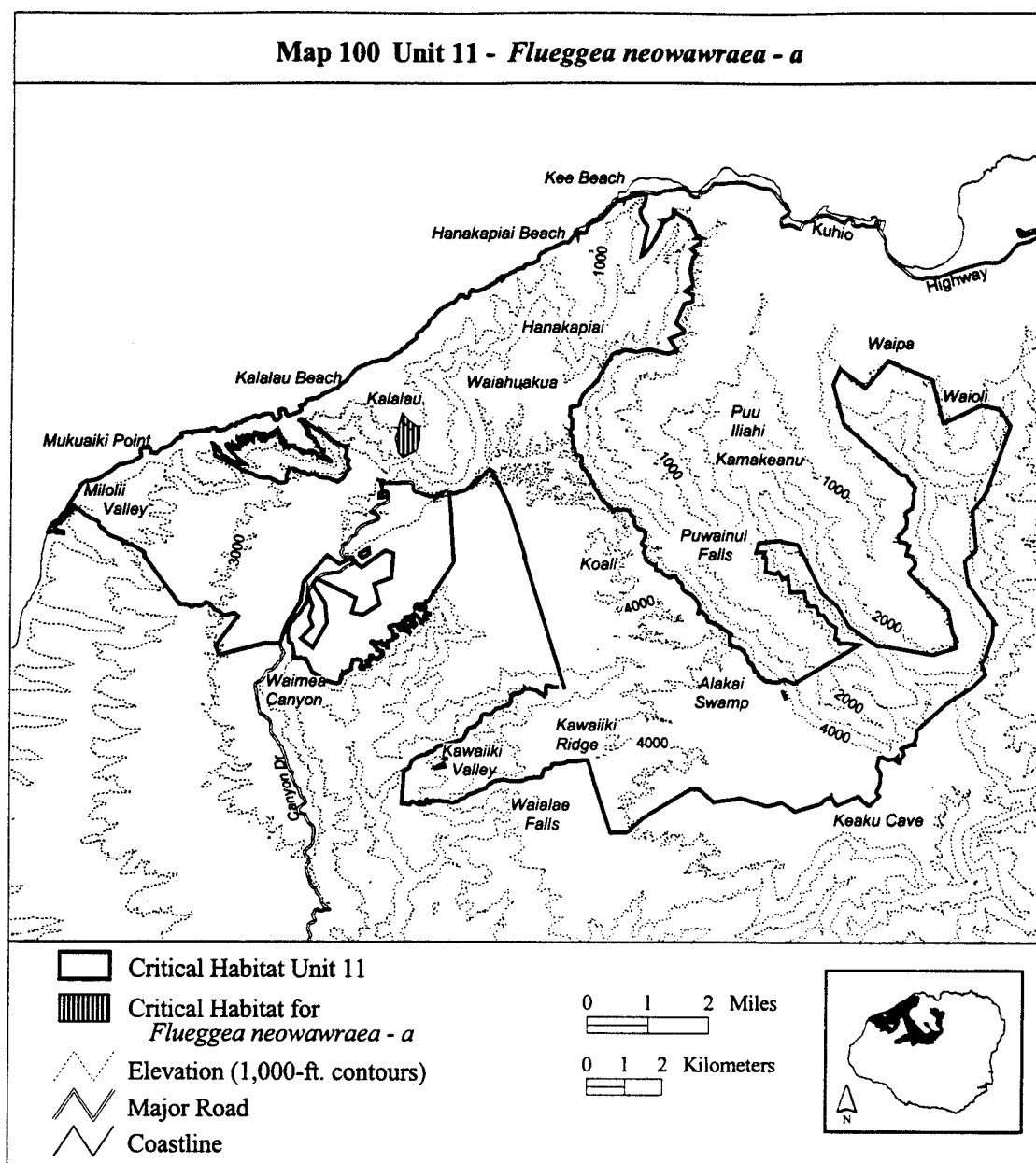
(c) Kauai 11—*Flueggea neowawraea*—a (51 ha; 126 ac)

(A) Unit consists of the following 12 boundary points: Start at 434000,

2450312; 433949, 2450368; 433864, 2450473; 433785, 2450832; 433850, 2451030; 433910, 2451245; 433941, 2451386; 433969, 2451525; 434153,

2451307; 434439, 2451106; 434442, 2450846; 434368, 2450518; return to starting point.

(B) **Note:** Map 100 follows:



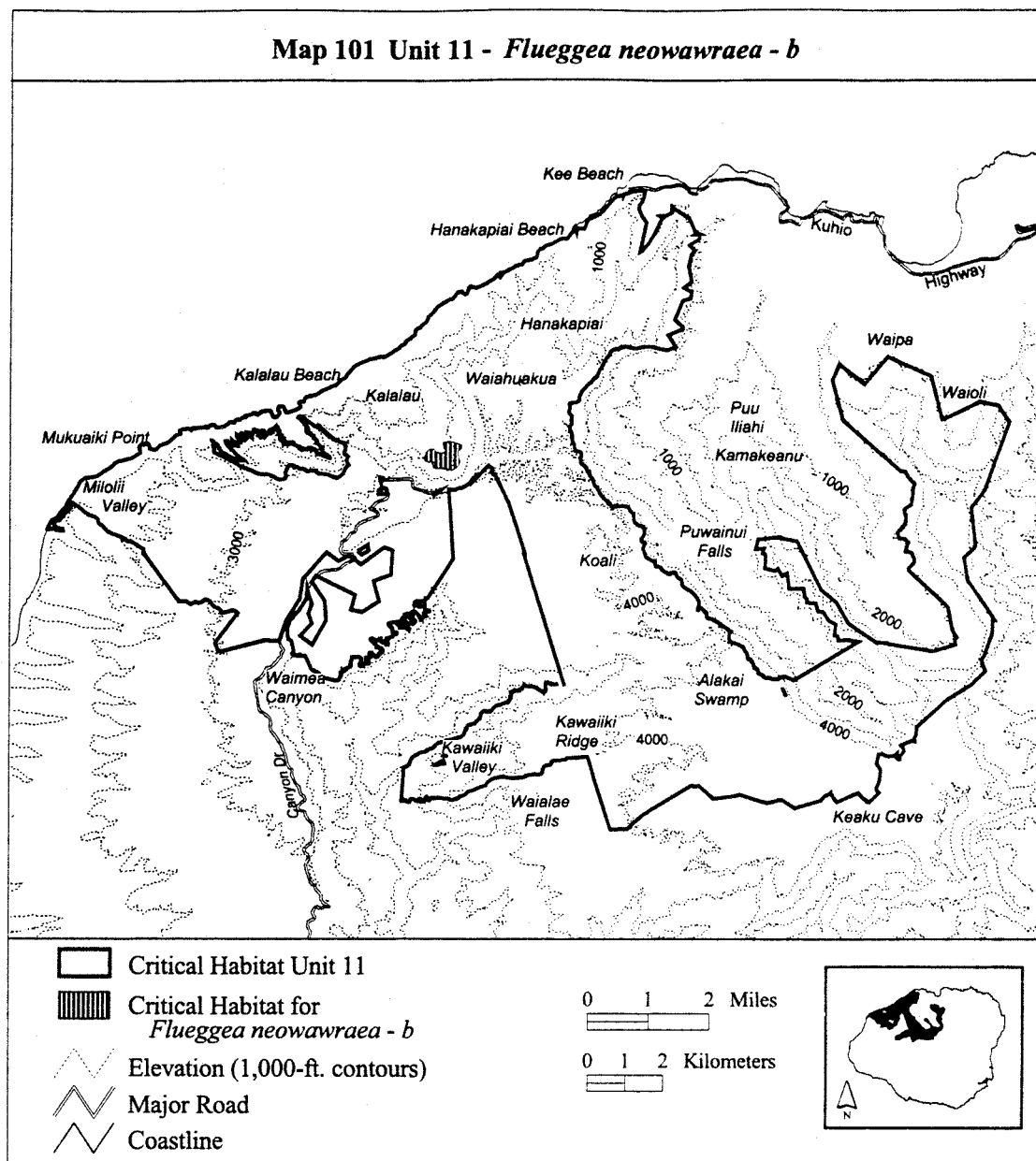
(ci) Kauai 11—*Flueggea neowawraea*—b
(47 ha; 117 ac)

(A) Unit consists of the following 28
boundary points: Start at 435053,
2450333; 435166, 2450421; 435094,
2450487; 435075, 2450618; 435179,

2450654; 435308, 2450654; 435574,
2450555; 435574, 2450470; 435476,
2450413; 435470, 2450325; 435489,
2450207; 435514, 2450108; 435498,
2450032; 435434, 2449958; 435330,
2449897; 435215, 2449903; 435042,
2449944; 434910, 2449936; 434836,

2449952; 434773, 2450128; 434628,
2450122; 434573, 2450194; 434633,
2450366; 434705, 2450440; 434776,
2450462; 434839, 2450454; 434883,
2450386; 434935, 2450358; return to
starting point.

(B) **Note:** Map 101 follows:



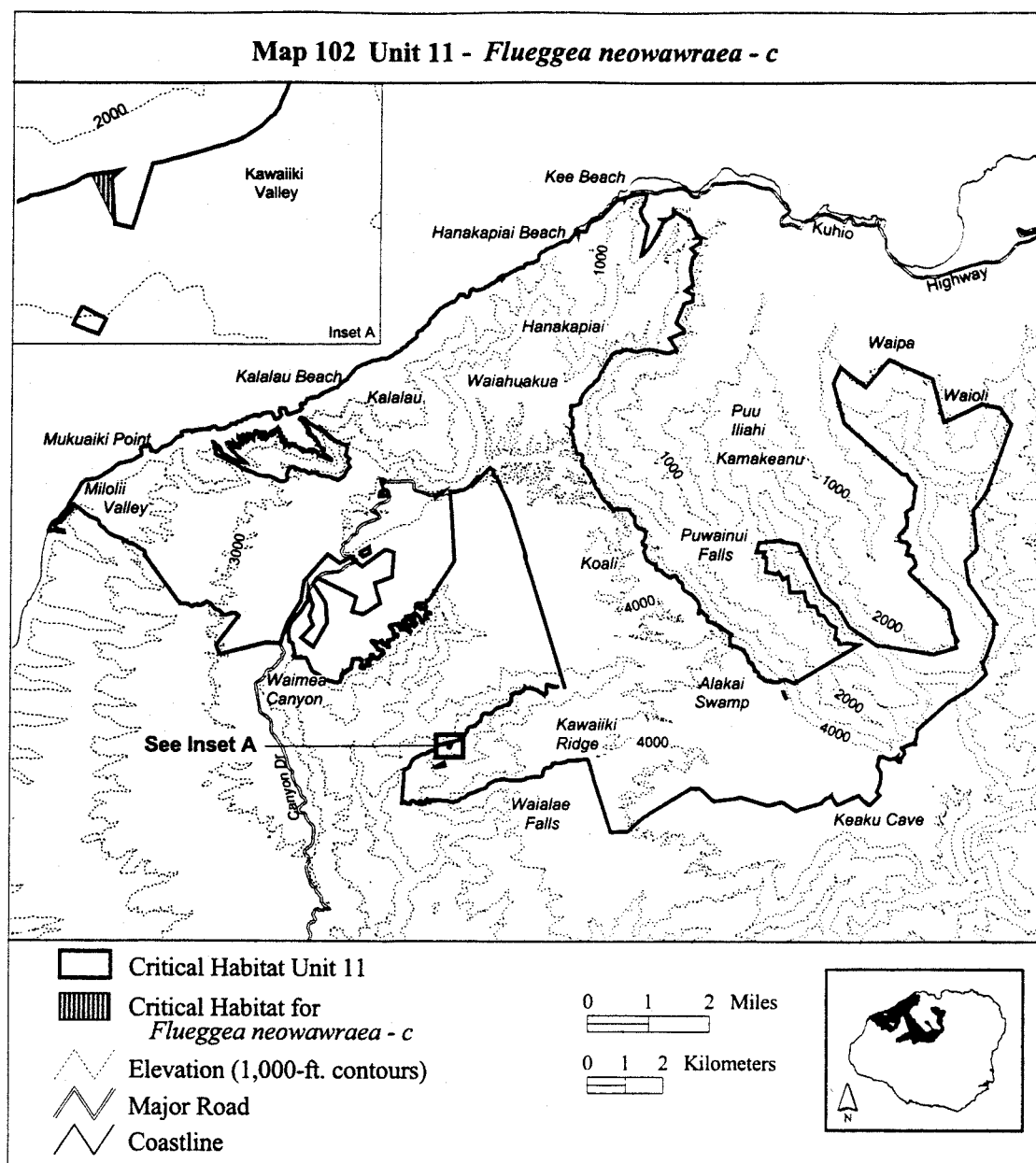
(cii) Kauai 11—*Flueggea neowawraea*—
c (152 ha; 376 ac)

(A) Unit consists of the following 8
boundary points: Start at 435236,

2442644; 435172, 2442772; 435184,
2442774; 435201, 2442777; 435219,
2442778; 435237, 2442782; 435251,

2442783; 435228, 2442762; return to
starting point.

(B) **Note:** Map 102 follows:



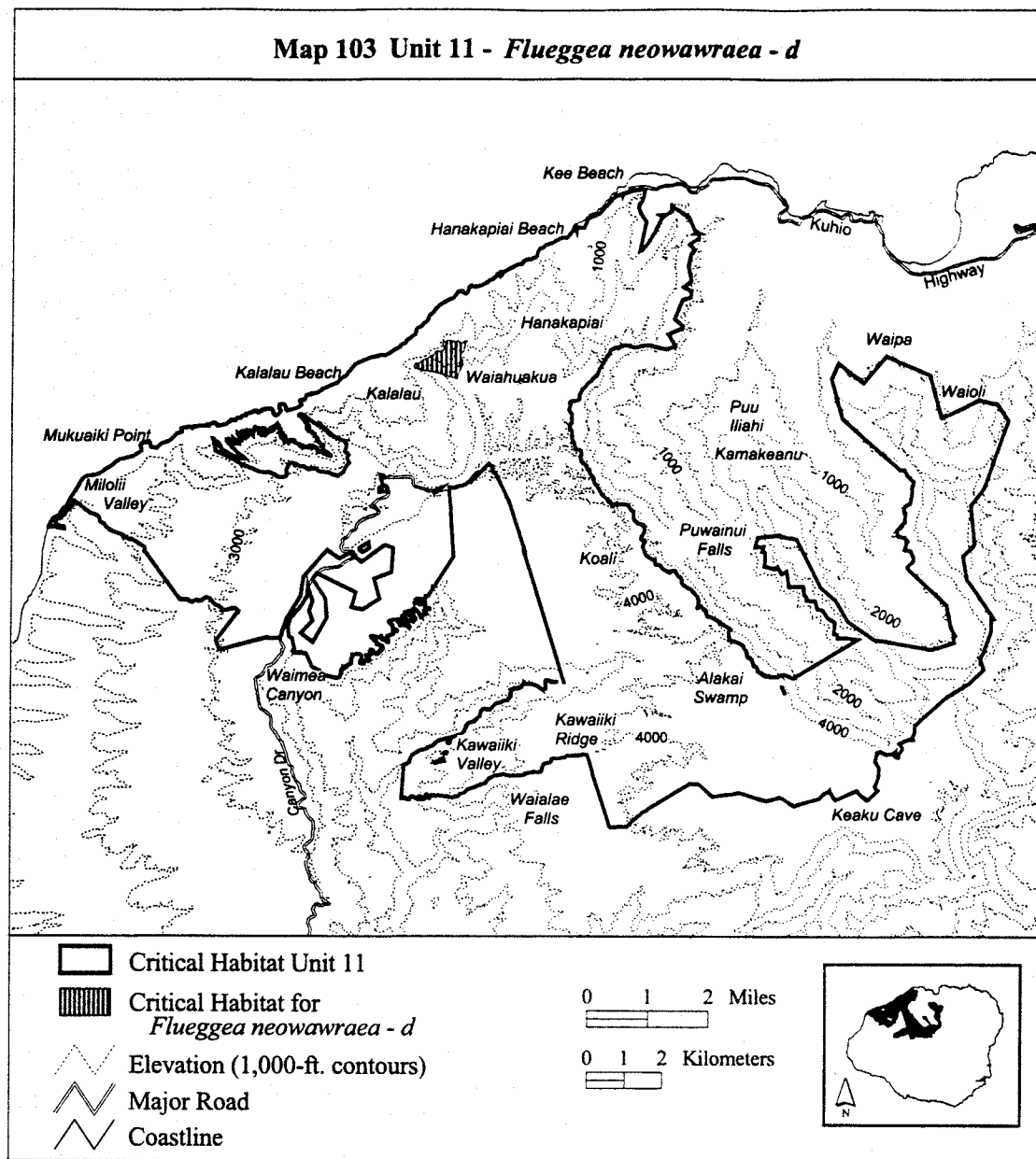
(ciii) Kauai 11—*Flueggea neowawraea*—
d (77 ha; 191 ac)

(A) Unit consists of the following 51
boundary points: Start at 435601,
2453022; 435552, 2452987; 435543,
2452967; 435543, 2452858; 435585,
2452742; 435585, 2452645; 435523,
2452533; 435465, 2452417; 435436,
2452291; 435369, 2452311; 435179,
2452369; 435037, 2452423; 434866,

2452465; 434660, 2452501; 434508,
2452517; 434392, 2452562; 434308,
2452585; 434282, 2452639; 434331,
2452707; 434382, 2452717; 434437,
2452733; 434476, 2452758; 434508,
2452794; 434534, 2452807; 434647,
2452852; 434698, 2452881; 434724,
2452926; 434798, 2452942; 434853,
2453003; 434901, 2453042; 434934,
2453038; 434966, 2453025; 434995,
2453025; 435062, 2453058; 435072,

2453103; 435066, 2453164; 435043,
2453238; 435069, 2453273; 435104,
2453293; 435143, 2453296; 435156,
2453306; 435169, 2453344; 435278,
2453315; 435401, 2453280; 435417,
2453296; 435459, 2453315; 435488,
2453286; 435511, 2453247; 435556,
2453251; 435610, 2453302; 435675,
2453302; return to starting point.

(B) **Note:** Map 103 follows:



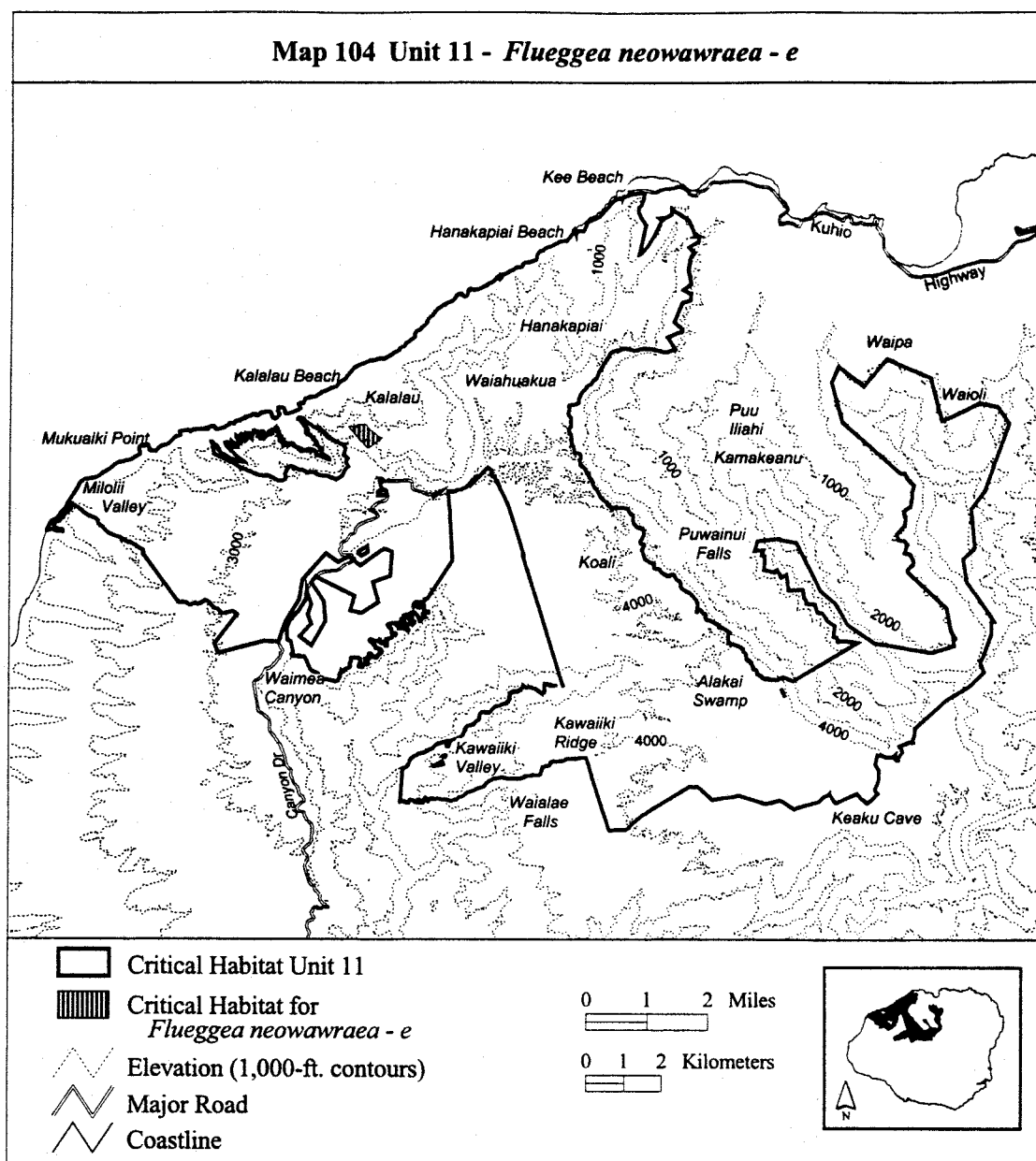
(civ) Kauai 11—*Flueggea neowawraea*—
e (27 ha; 67 ac)

(A) Unit consists of the following 14
boundary points: Start at 432615,

2451107; 432699, 2451108; 433006,
2451176; 433021, 2451179; 433036,
2451174; 433144, 2451038; 433233,
2450957; 433419, 2450821; 433475,
2450808; 433290, 2450648; 433095,

2450524; 432852, 2450782; 432650,
2451016; 432594, 2451102; return to
starting point.

(B) **Note:** Map 104 follows:



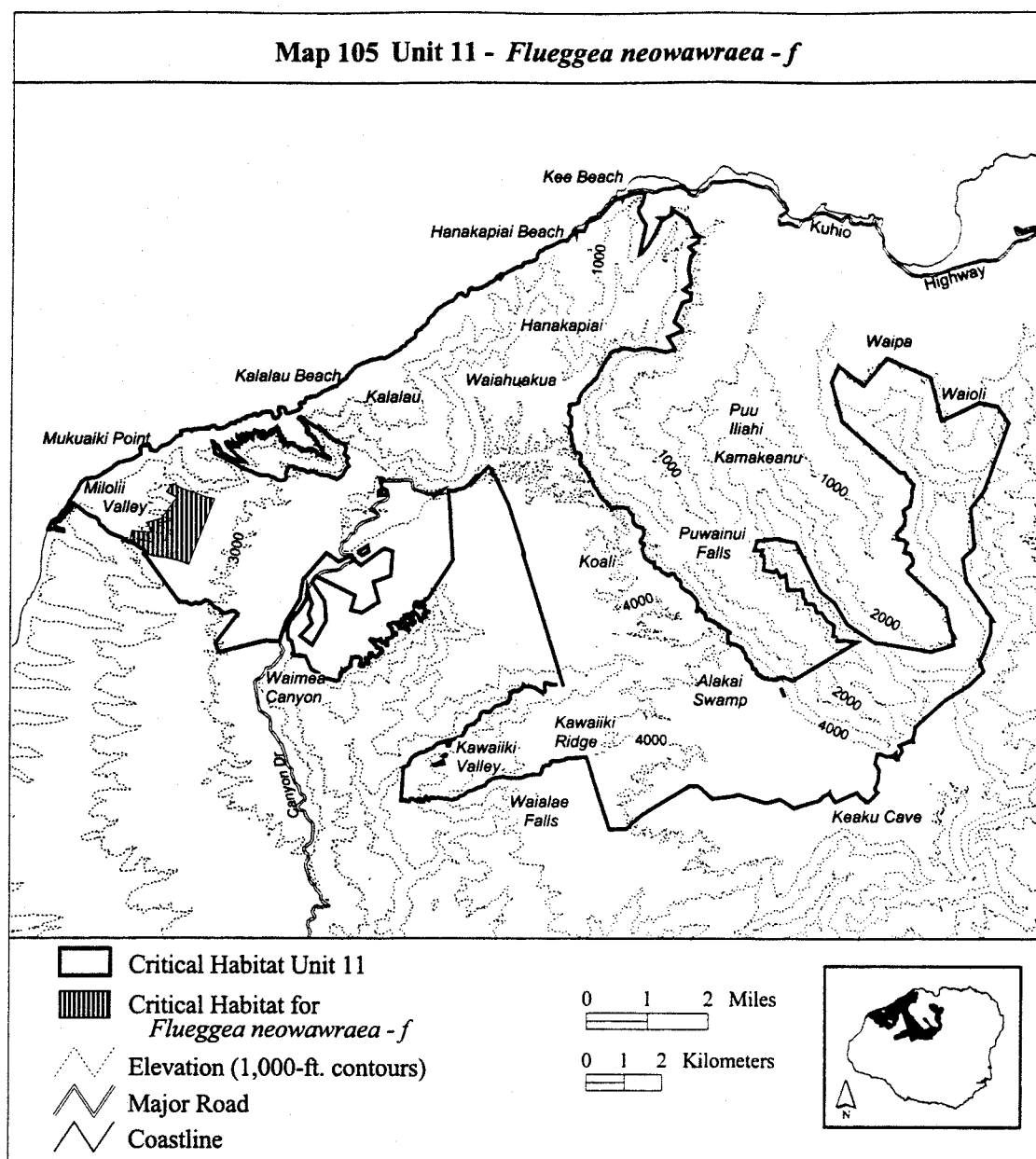
(cv) Kauai 11—*Flueggea neowawraea*—f (240 ha; 594 ac)

(A) Unit consists of the following 27 boundary points: Start at 426767, 2448021; 426831, 2448310; 427314, 2448265; 427337, 2448374; 427206,

2448518; 427613, 2448631; 428020, 2449196; 427749, 2449350; 427898, 2449558; 427966, 2449562; 428160, 2449427; 428391, 2449359; 428802, 2449205; 429028, 2449155; 428345, 2447429; 428165, 2447501; 427884, 2447569; 427464, 2447641; 427418,

2447641; 427233, 2447691; 427161, 2447827; 427130, 2447833; 427124, 2447837; 427084, 2447847; 427065, 2447855; 426993, 2447931; 426885, 2447998; return to starting point.

(B) **Note:** Map 105 follows:



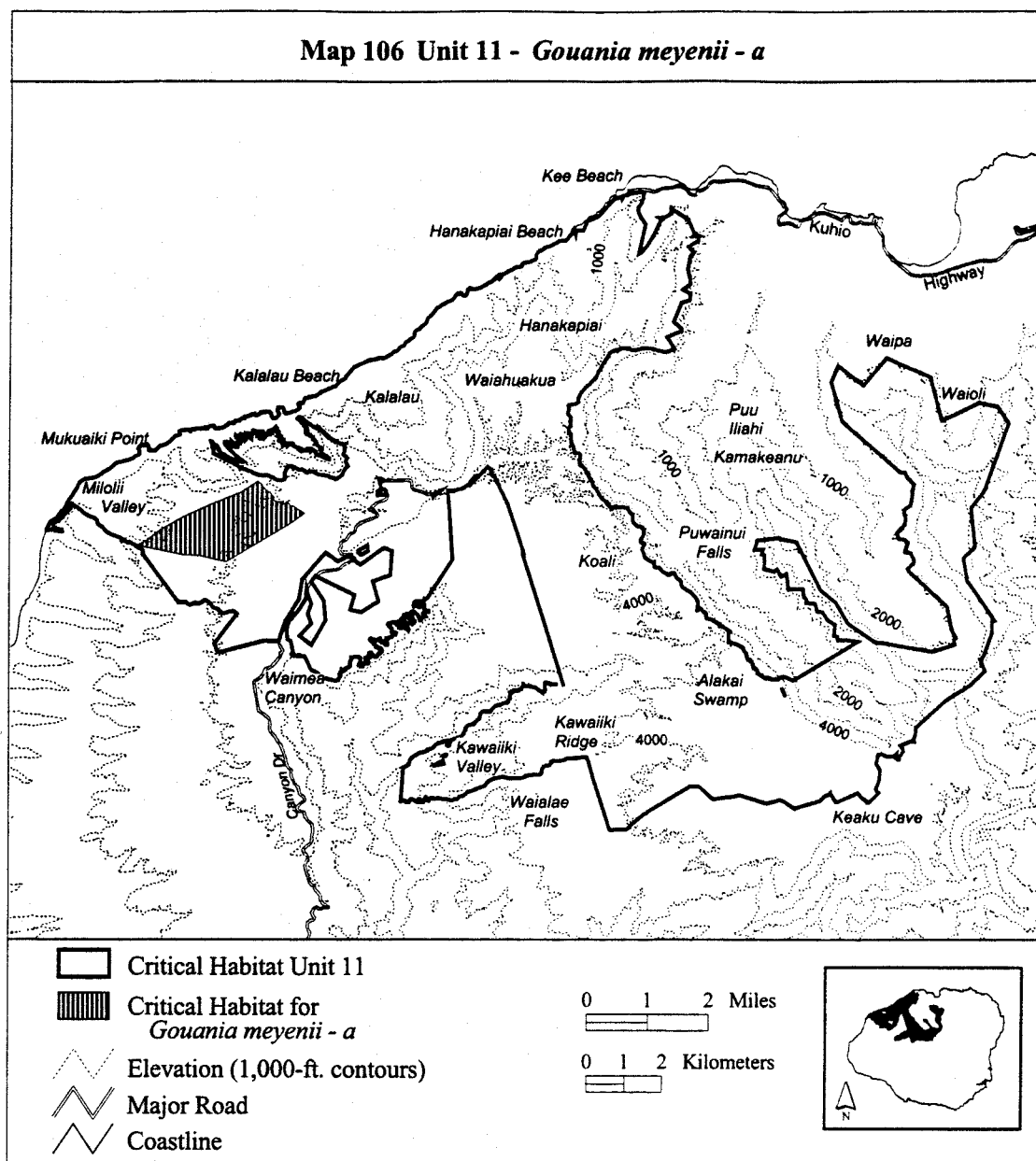
(cvi) Kauai 11—*Gouania meyenii*—a (443 ha; 1,094 ac)

(A) Unit consists of the following 61 boundary points: Start at 429367, 2447493; 428683, 2447645; 428241, 2447686; 427018, 2447921; 427281, 2448080; 427605, 2448322; 428213, 2448667; 428883, 2448977; 429740, 2449322; 430202, 2449633; 430314, 2449534; 430313, 2449532; 430312, 2449517; 430307, 2449482; 430318, 2449477; 430335, 2449474; 430349,

2449466; 430355, 2449451; 430369, 2449433; 430418, 2449395; 430437, 2449371; 430430, 2449364; 430451, 2449363; 430463, 2449355; 430474, 2449342; 430485, 2449333; 430527, 2449321; 430533, 2449310; 430545, 2449277; 430559, 2449254; 430604, 2449229; 430616, 2449214; 430623, 2449194; 430623, 2449173; 430616, 2449156; 430619, 2449138; 430629, 2449119; 430643, 2449106; 430677, 2449084; 430699, 2449074; 430717,

2449071; 430748, 2449070; 430773, 2449073; 430799, 2449081; 430825, 2449080; 430875, 2449032; 430881, 2449027; 430905, 2449022; 430921, 2449029; 430944, 2449045; 430955, 2449058; 431025, 2449016; 431024, 2449005; 431035, 2448975; 431050, 2448960; 431066, 2448956; 431086, 2448957; 431093, 2448962; 431099, 2448970; 431432, 2448770; 431052, 2448487; return to starting point.

(B) **Note:** Map 106 follows:



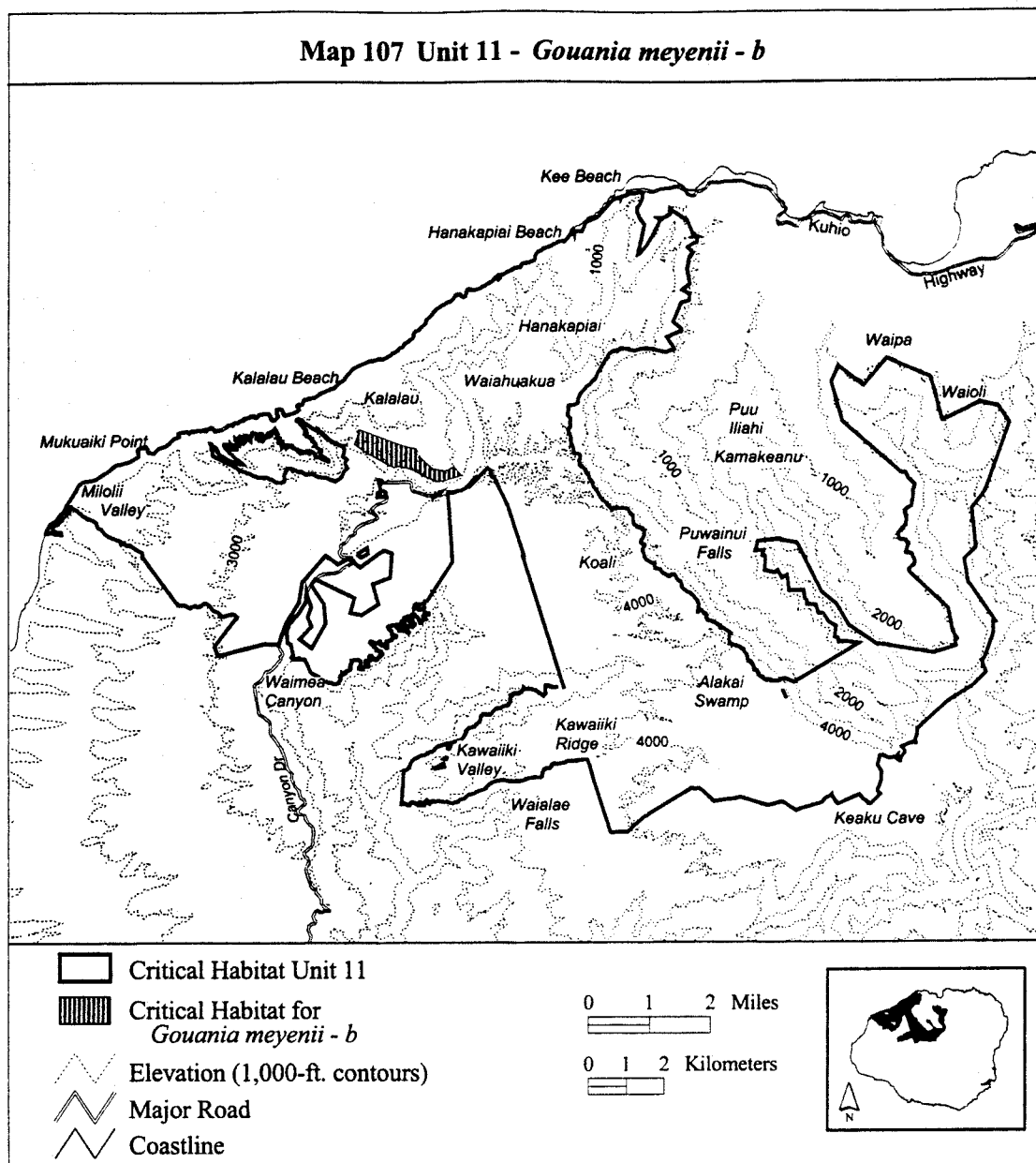
(cvii) Kauai 11—*Gouania meyenii*—b
(128 ha; 316 ac)

(A) Unit consists of the following 20
boundary points: Start at 432908,
2451056; 433375, 2450880; 433953,

2450654; 434234, 2450563; 434395,
2450548; 434531, 2450292; 434832,
2450011; 435169, 2449930; 435405,
2450056; 435596, 2449830; 435124,
2449679; 434943, 2449669; 434611,
2449820; 434330, 2449971; 434234,

2450006; 433943, 2450071; 433807,
2450051; 433641, 2450127; 433053,
2450458; 432767, 2450674; return to
starting point.

(B) **Note:** Map 107 follows:



(cviii) Kauai 11—*Gouania meyenii*—c
(215 ha; 532 ac)

(A) Unit consists of the following 246 boundary points: Start at 435336, 2442801; 435344, 2442802; 435367, 2442807; 435391, 2442814; 435415, 2442819; 435435, 2442826; 435454, 2442831; 435476, 2442838; 435496, 2442844; 435516, 2442850; 435530, 2442853; 435534, 2442855; 435543, 2442858; 435556, 2442862; 435571, 2442867; 435585, 2442876; 435598, 2442885; 435608, 2442891; 435619, 2442899; 435627, 2442904; 435642, 2442920; 435658, 2442932; 435668, 2442948; 435673, 2442959; 435681, 2442977; 435688, 2442995; 435693, 2443006; 435698, 2443024; 435704,

2443036; 435708, 2443047; 435715, 2443064; 435722, 2443078; 435725, 2443086; 435729, 2443093; 435735, 2443103; 435738, 2443112; 435743, 2443127; 435749, 2443138; 435753, 2443149; 435757, 2443155; 435766, 2443169; 435778, 2443179; 435790, 2443186; 435804, 2443188; 435821, 2443194; 435842, 2443199; 435861, 2443202; 435874, 2443204; 435889, 2443208; 435904, 2443211; 435933, 2443223; 435942, 2443232; 435949, 2443246; 435958, 2443255; 435969, 2443263; 435979, 2443271; 435993, 2443281; 436010, 2443297; 436032, 2443316; 436048, 2443332; 436064, 2443343; 436080, 2443358; 436089, 2443375; 436095, 2443390; 436100, 2443403; 436107, 2443421; 436113,

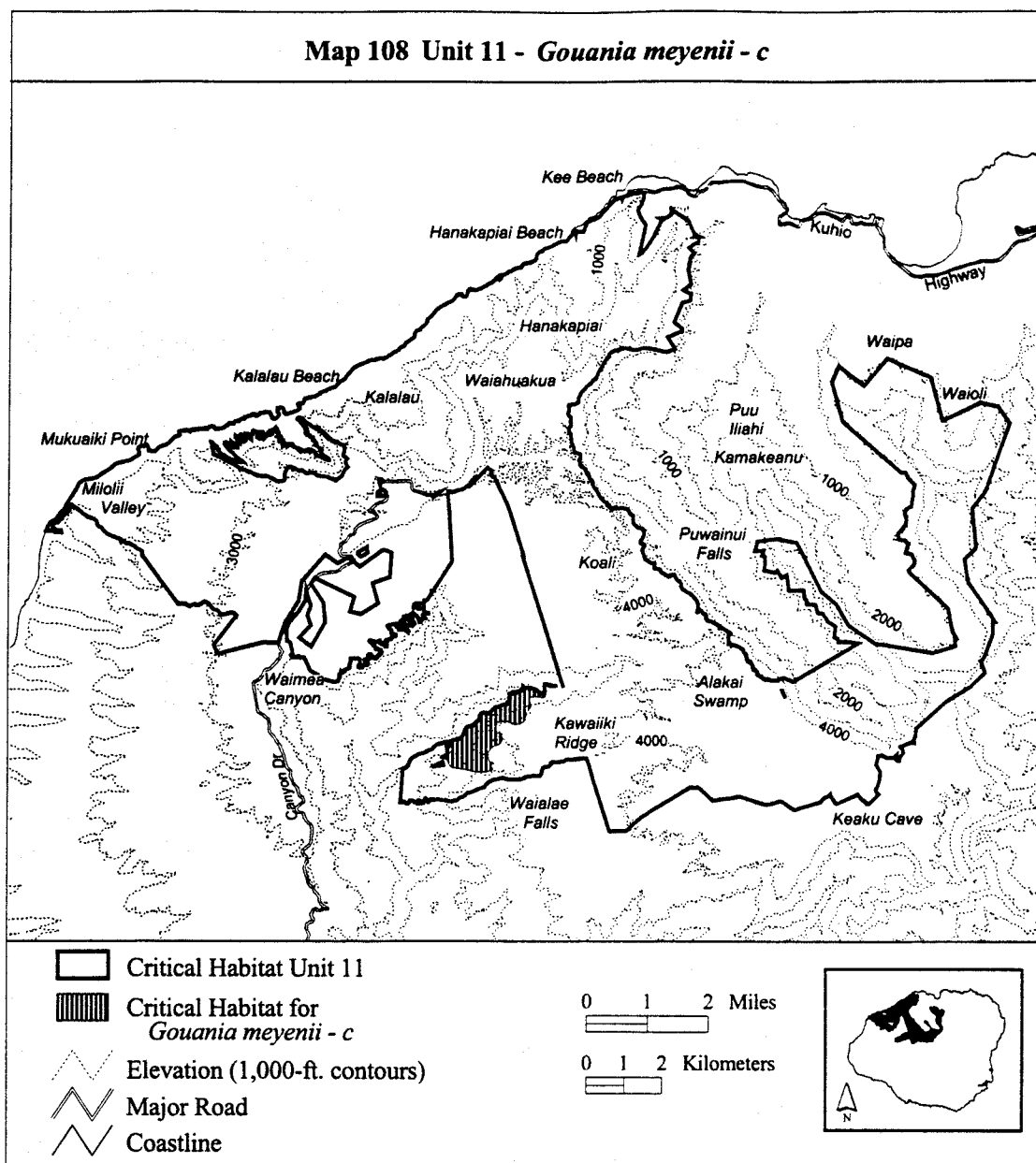
2443456; 436118, 2443477; 436123, 2443502; 436134, 2443520; 436146, 2443534; 436160, 2443543; 436175, 2443554; 436190, 2443560; 436213, 2443563; 436227, 2443563; 436240, 2443562; 436254, 2443557; 436265, 2443552; 436274, 2443547; 436287, 2443540; 436300, 2443537; 436315, 2443532; 436328, 2443529; 436337, 2443528; 436348, 2443531; 436357, 2443536; 436369, 2443546; 436380, 2443558; 436392, 2443572; 436403, 2443585; 436421, 2443611; 436438, 2443631; 436460, 2443655; 436478, 2443676; 436497, 2443688; 436518, 2443696; 436534, 2443700; 436558, 2443707; 436576, 2443711; 436597, 2443714; 436611, 2443716; 436630, 2443718; 436644, 2443720; 436655,

2443724; 436666, 2443731; 436678,
2443742; 436697, 2443756; 436708,
2443763; 436726, 2443769; 436745,
2443772; 436758, 2443775; 436771,
2443776; 436788, 2443776; 436799,
2443778; 436808, 2443781; 436818,
2443785; 436823, 2443786; 436829,
2443790; 436837, 2443797; 436841,
2443801; 436845, 2443807; 436852,
2443819; 436861, 2443831; 436870,
2443847; 436882, 2443863; 436890,
2443877; 436900, 2443900; 436911,
2443923; 436914, 2443936; 436914,
2443948; 436913, 2443962; 436910,
2443981; 436908, 2443995; 436908,
2444013; 436911, 2444027; 436918,
2444040; 436926, 2444047; 436933,
2444055; 436942, 2444065; 436951,
2444073; 436961, 2444084; 436969,
2444094; 436975, 2444098; 436983,
2444102; 436994, 2444107; 437009,
2444108; 437026, 2444105; 437049,
2444100; 437067, 2444092; 437076,
2444089; 437106, 2444090; 437119,
2444096; 437128, 2444104; 437133,

2444112; 437137, 2444122; 437144,
2444130; 437156, 2444135; 437169,
2444141; 437183, 2444150; 437191,
2444154; 437202, 2444165; 437212,
2444177; 437228, 2444198; 437239,
2444213; 437245, 2444227; 437254,
2444239; 437263, 2444246; 437278,
2444240; 437294, 2444234; 437310,
2444225; 437332, 2444217; 437351,
2444217; 437370, 2444223; 437391,
2444223; 437412, 2444226; 437428,
2444226; 437445, 2444223; 437462,
2444219; 437482, 2444211; 437497,
2444205; 437541, 2444190; 437563,
2444183; 437578, 2444179; 437593,
2444170; 437610, 2444160; 437624,
2444146; 437636, 2444132; 437651,
2444119; 437671, 2444112; 437691,
2444102; 437703, 2444093; 437722,
2444082; 437732, 2444069; 437749,
2444061; 437758, 2444058; 437768,
2444060; 437780, 2444066; 437801,
2444076; 437842, 2444038; 437854,
2443995; 437806, 2443948; 437692,
2443963; 437605, 2443975; 437466,

2443983; 437423, 2443920; 437450,
2443829; 437474, 2443766; 437454,
2443683; 437383, 2443608; 437340,
2443533; 437320, 2443410; 437265,
2443311; 437193, 2443264; 437047,
2443248; 436838, 2443339; 436581,
2443312; 436553, 2443248; 436553,
2443153; 436557, 2443035; 436660,
2443003; 436727, 2442849; 436672,
2442719; 436470, 2442644; 436351,
2442513; 436324, 2442387; 436363,
2442276; 436462, 2442225; 436506,
2442150; 436450, 2442031; 436280,
2441980; 435996, 2441980; 435723,
2442051; 435675, 2442051; 435351,
2442106; 435304, 2442181; 435245,
2442312; 435181, 2442774; 435184,
2442774; 435201, 2442777; 435219,
2442778; 435237, 2442782; 435251,
2442783; 435228, 2442762; 435237,
2442643; 435284, 2442631; return to
starting point.

(B) **Note:** Map 108 follows:



(cix) Kauai 11—*Hedyotis cookiana*—a (771 ha; 1,905 ac)

(A) Unit consists of the following 197 boundary points: Start at 439564, 2456133; 439459, 2455948; 439445, 2455829; 439379, 2455816; 439379, 2455578; 439326, 2455446; 439326, 2455300; 439234, 2455208; 439247, 2455089; 439234, 2455036; 439459, 2454944; 439459, 2454838; 439393, 2454745; 439445, 2454666; 439379, 2454560; 439393, 2454455; 439419, 2454402; 439393, 2454296; 439287, 2454177; 439088, 2454296; 439075, 2454164; 439022, 2454138; 439154, 2454006; 439115, 2453913; 439221, 2453847; 439168, 2453741; 439181, 2453517; 439207, 2453332; 439181, 2453279; 439075, 2453345; 439022,

2453451; 438810, 2453530; 438652, 2453477; 438533, 2453649; 438519, 2453808; 438506, 2453860; 438400, 2453860; 438400, 2453913; 438347, 2453953; 438387, 2454045; 438281, 2454072; 438321, 2454204; 438228, 2454217; 438374, 2454323; 438427, 2454455; 438334, 2454468; 438281, 2454482; 438268, 2454574; 438109, 2454535; 438136, 2454653; 438109, 2454772; 438017, 2454746; 437964, 2454812; 437964, 2454931; 437884, 2454931; 437884, 2455090; 437937, 2455129; 438017, 2455142; 437924, 2455195; 437858, 2455208; 437818, 2455354; 437739, 2455354; 437765, 2455169; 437752, 2455010; 437739, 2454944; 437646, 2454931; 437607, 2454878; 437527, 2454839; 437593,

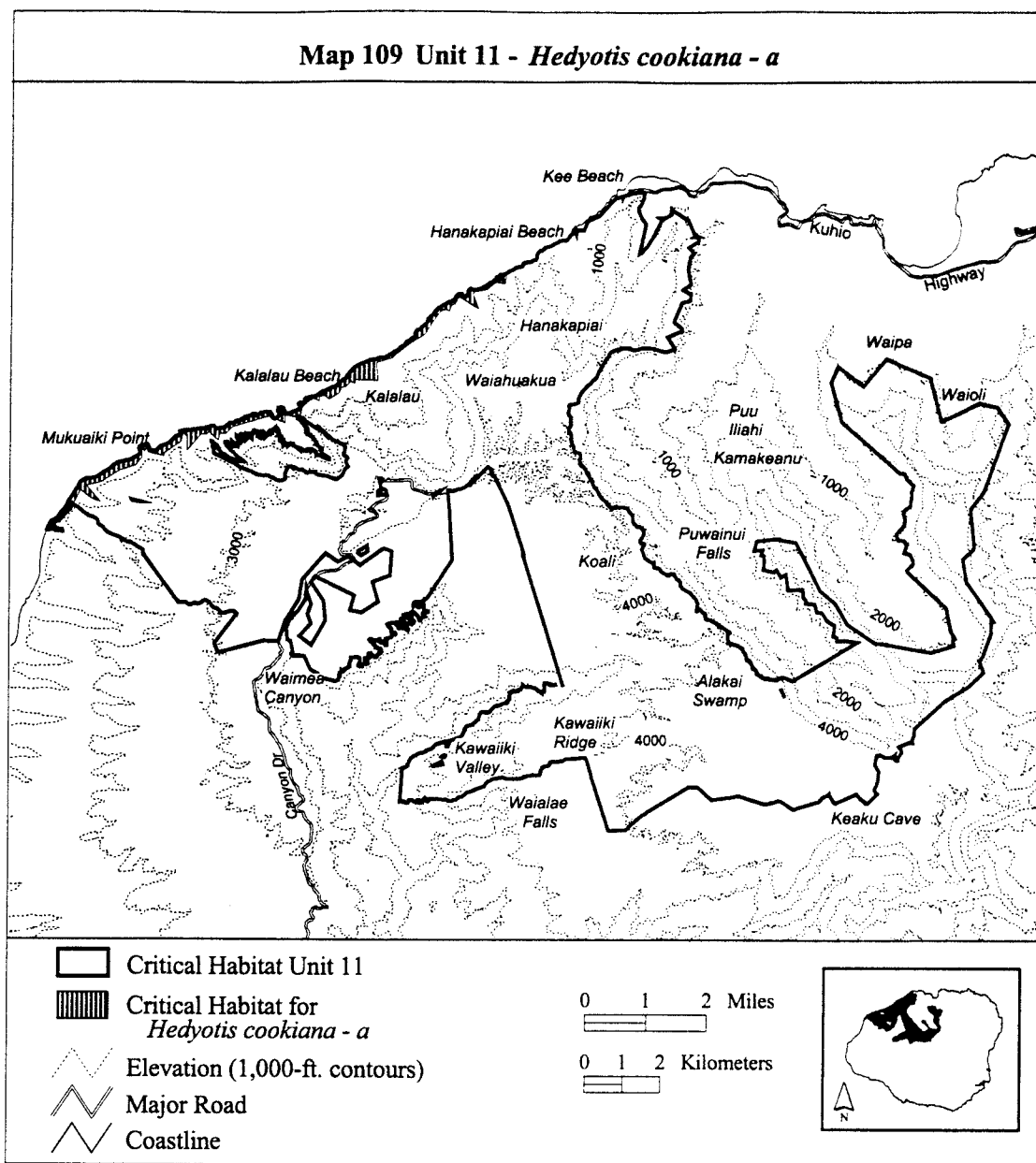
2454733; 437514, 2454707; 437421, 2454733; 437421, 2454680; 437342, 2454680; 437316, 2454601; 437236, 2454707; 437197, 2454693; 437144, 2454839; 437130, 2454799; 437117, 2454614; 437144, 2454561; 437197, 2454469; 437157, 2454416; 437223, 2454284; 437091, 2454218; 437091, 2453993; 437011, 2453980; 436853, 2454112; 436800, 2454046; 436747, 2454086; 436707, 2454297; 436707, 2454363; 436562, 2454429; 436376, 2454601; 436310, 2454548; 436495, 2454350; 436482, 2454244; 436535, 2454191; 436482, 2454099; 436562, 2453954; 436694, 2453663; 436694, 2453557; 436522, 2453584; 436165, 2453637; 436138, 2453518; 435979, 2453214; 435834, 2453267; 435834,

2453425; 435808, 2453690; 435794,
2453822; 435702, 2454020; 435649,
2453861; 435636, 2453637; 435530,
2453531; 435530, 2453399; 435397,
2453412; 435080, 2453373; 435120,
2453254; 435001, 2453254; 435053,
2453108; 434908, 2453082; 434233,
2452673; 434339, 2452355; 434432,
2452250; 434604, 2452210; 434710,
2451866; 434842, 2451470; 434815,
2451020; 434802, 2450875; 434207,
2450875; 433545, 2450836; 433162,
2450968; 433029, 2451206; 433096,
2451589; 432699, 2451761; 432633,
2452197; 432778, 2452092; 432924,
2452105; 433016, 2452052; 433201,

2452052; 433532, 2451801; 433810,
2452012; 433704, 2452224; 433612,
2452514; 433519, 2452699; 433532,
2452792; 433850, 2452845; 434127,
2453135; 434432, 2453228; 434590,
2453412; 434776, 2453346; 434762,
2453637; 434802, 2453743; 435040,
2453756; 435001, 2453914; 435225,
2453928; 435186, 2454073; 435384,
2454020; 435358, 2454218; 435503,
2454324; 436019, 2454086; 436151,
2453993; 436112, 2454337; 436085,
2454482; 436032, 2454641; 436284,
2454720; 436482, 2454813; 436839,
2454627; 436853, 2454799; 436813,
2454971; 436800, 2455143; 437091,

2455235; 437263, 2455024; 437316,
2455195; 437514, 2455275; 437448,
2455354; 437660, 2455592; 437805,
2455605; 437924, 2455750; 438215,
2455895; 438281, 2455591; 438242,
2455433; 438467, 2455235; 438519,
2454944; 438705, 2454719; 438797,
2454534; 438903, 2454812; 438916,
2455076; 438837, 2455287; 438916,
2455406; 438850, 2455604; 438758,
2455671; 438731, 2455803; 438678,
2455895; 438638, 2456146; 438691,
2456199; 439022, 2456067; 439022,
2456278; return to starting point.

(B) Note: Map 109 follows:



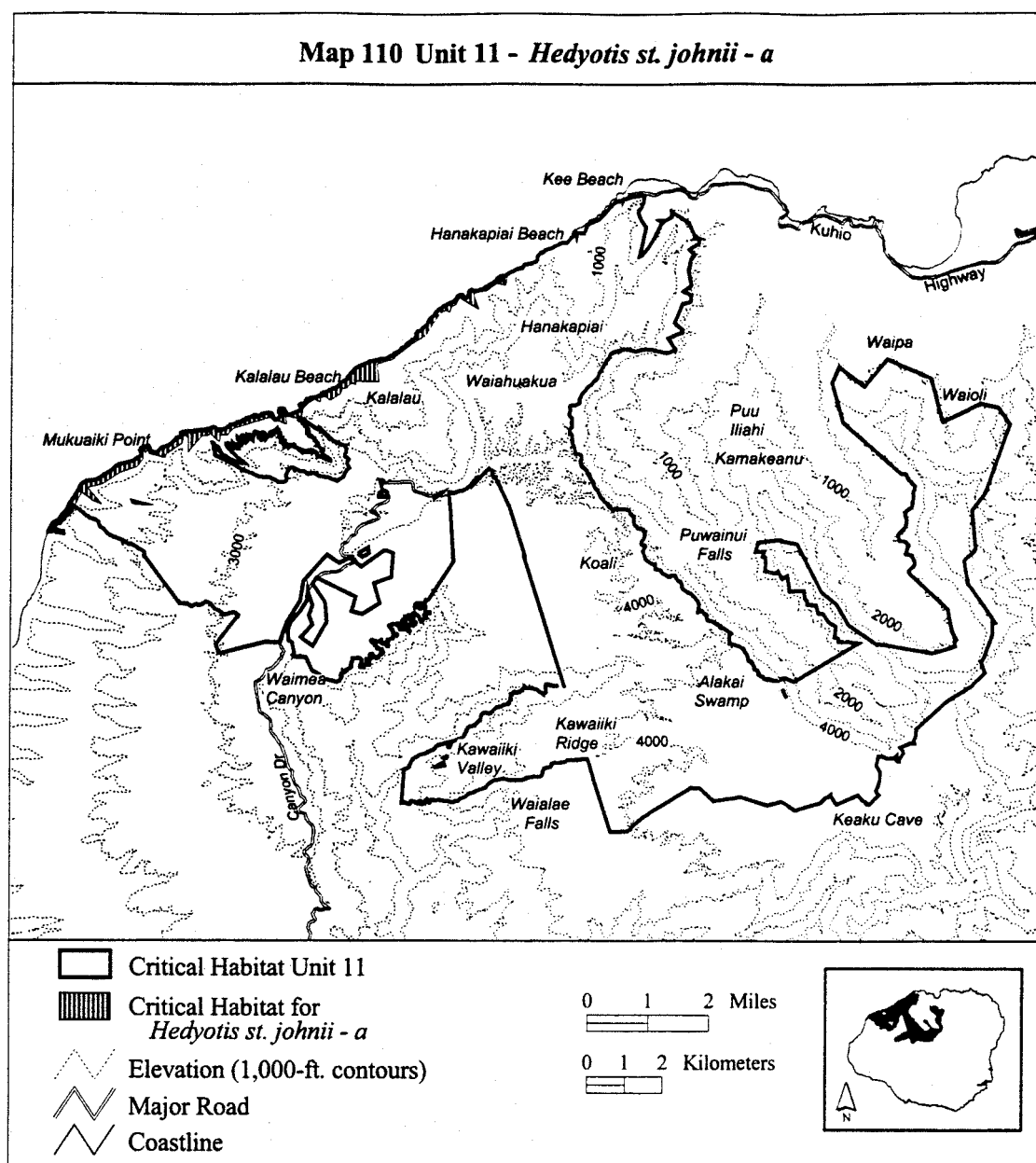
(cx) Kauai 11—*Hedyotis st. johnii*—a
(240 ha; 593 ac)

(A) Unit consists of the following 183
boundary points: coastline; 436761,
2455184; 436712, 2454892; 436479,
2454944; 436221, 2454738; 435934,
2454699; 435854, 2454648; 435988,
2454247; 435497, 2454557; 435394,
2454376; 435291, 2454325; 435239,
2454170; 435110, 2454222; 434981,
2454144; 434803, 2453887; 434586,
2453544; 434231, 2453319; 433798,
2452984; 433752, 2452923; 433308,
2452782; 433353, 2452312; 432747,
2452333; 432742, 2452243; 432641,
2452288; 432573, 2452247; 432525,
2452167; 432394, 2452127; 432333,
2452001; 432061, 2451822; 431939,
2451935; 431794, 2451884; 431798,
2451784; 431661, 2451854; 431544,
2451797; 431338, 2451616; 431318,
2451426; 431183, 2451358; 430888,
2451421; 430898, 2451203; 430666,
2451294; 430535, 2451320; 430469,
2451390; 430149, 2451281; 429503,
2451074; 429338, 2450901; 429167,
2450919; 429131, 2450729; 429064,
2450790; 428883, 2450945; 428817,
2450876; 428676, 2450881; 428314,
2450455; 428314, 2450842; 428181,
2450916; 428156, 2450755; 428141,
2450689; 427991, 2450578; 427711,

2450396; 427696, 2450306; 427356,
2450395; 427289, 2450413; 427226,
2450518; 427181, 2450422; 427120,
2450518; 427099, 2450470; 427120,
2450270; 426959, 2450063; 426506,
2449913; 426060, 2449619; 425852,
2449550; 425640, 2449518; 426014,
2449089; 425788, 2449164; 425489,
2449387; 425301, 2449004; 425272,
2449039; 425267, 2449033; 425258,
2449022; 425253, 2449013; 425252,
2449003; 425253, 2448996; 425251,
2448992; 425242, 2448981; 425239,
2448972; 425231, 2448956; 425224,
2448934; 425222, 2448911; 425223,
2448900; 425224, 2448891; 425223,
2448883; 425218, 2448877; 425212,
2448878; 425208, 2448876; 425201,
2448872; 425192, 2448867; 425181,
2448859; 425172, 2448853; 425162,
2448844; 425158, 2448833; 425157,
2448818; 425153, 2448809; 425148,
2448807; 425136, 2448801; 425124,
2448795; 425120, 2448790; 425112,
2448785; 425100, 2448774; 425094,
2448768; 425081, 2448757; 425070,
2448745; 425062, 2448734; 425053,
2448723; 425044, 2448711; 425043,
2448695; 425029, 2448684; 425024,
2448675; 425017, 2448667; 425011,
2448659; 424999, 2448650; 424991,
2448642; 424980, 2448628; 424973,
2448615; 424956, 2448592; 424936,

2448587; 424929, 2448581; 424924,
2448574; 424917, 2448569; 424910,
2448561; 424906, 2448551; 424898,
2448552; 424886, 2448554; 424877,
2448554; 424871, 2448552; 424863,
2448548; 424849, 2448543; 424840,
2448538; 424824, 2448534; 424811,
2448524; 424803, 2448521; 424795,
2448511; 424785, 2448498; 424778,
2448484; 424774, 2448461; 424778,
2448445; 424791, 2448421; 424819,
2448402; 424832, 2448389; 424848,
2448376; 424871, 2448368; 424900,
2448356; 424929, 2448346; 424953,
2448337; 424973, 2448335; 424990,
2448333; 424997, 2448333; 425003,
2448327; 425006, 2448318; 425009,
2448308; 425011, 2448298; 425013,
2448289; 425015, 2448280; 425010,
2448272; 424998, 2448277; 424991,
2448284; 424983, 2448288; 424971,
2448291; 424957, 2448291; 424948,
2448290; 424933, 2448287; 424927,
2448284; 424915, 2448289; 424892,
2448299; 424874, 2448301; 424841,
2448311; 424823, 2448330; 424803,
2448337; 424777, 2448336; 424735,
2448339; 424711, 2448334; 424677,
2448333; 424664, 2448328; 424648,
2448323; 424633, 2448323; 424603,
2448328; coastline.

(B) **Note:** Map 110 follows:



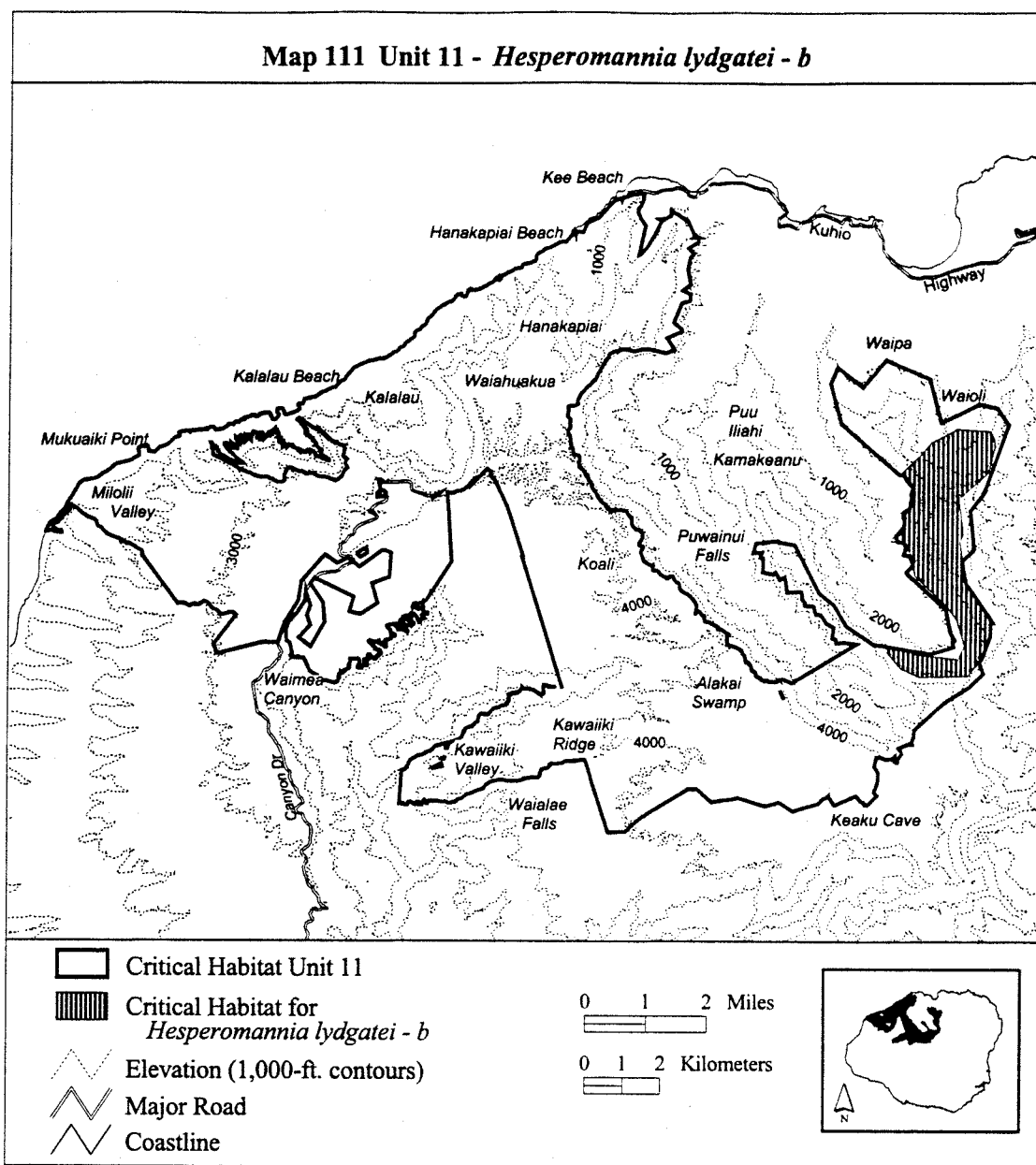
(cxi) Kauai 11—*Hesperomannia lydgatei*—b (913 ha; 2,257 ac)

(A) Unit consists of the following 40 boundary points: Start at 449025, 2444558; 449034, 2444577; 447785, 2444536; 447265, 2444785; 446918, 2445192; 446929, 2445275; 446911, 2445345; 447532, 2445239; 447640,

2445139; 448264, 2445076; 448784, 2445014; 448951, 2445367; 448722, 2446074; 448431, 2446449; 447619, 2447218; 447515, 2447780; 447265, 2448196; 447369, 2448840; 447577, 2449152; 447500, 2449383; 447568, 2449571; 447383, 2449734; 447307, 2449963; 447288, 2449973; 447777, 2450446; 448043, 2450744; 448734,

2451117; 449607, 2451049; 449711, 2450800; 449711, 2450644; 449545, 2449954; 449353, 2449767; 448773, 2449272; 448893, 2448312; 448803, 2448103; 448983, 2446963; 449643, 2446064; 449643, 2445644; 449433, 2445045; 449043, 2444565; return to starting point.

(B) **Note:** Map 111 follows:



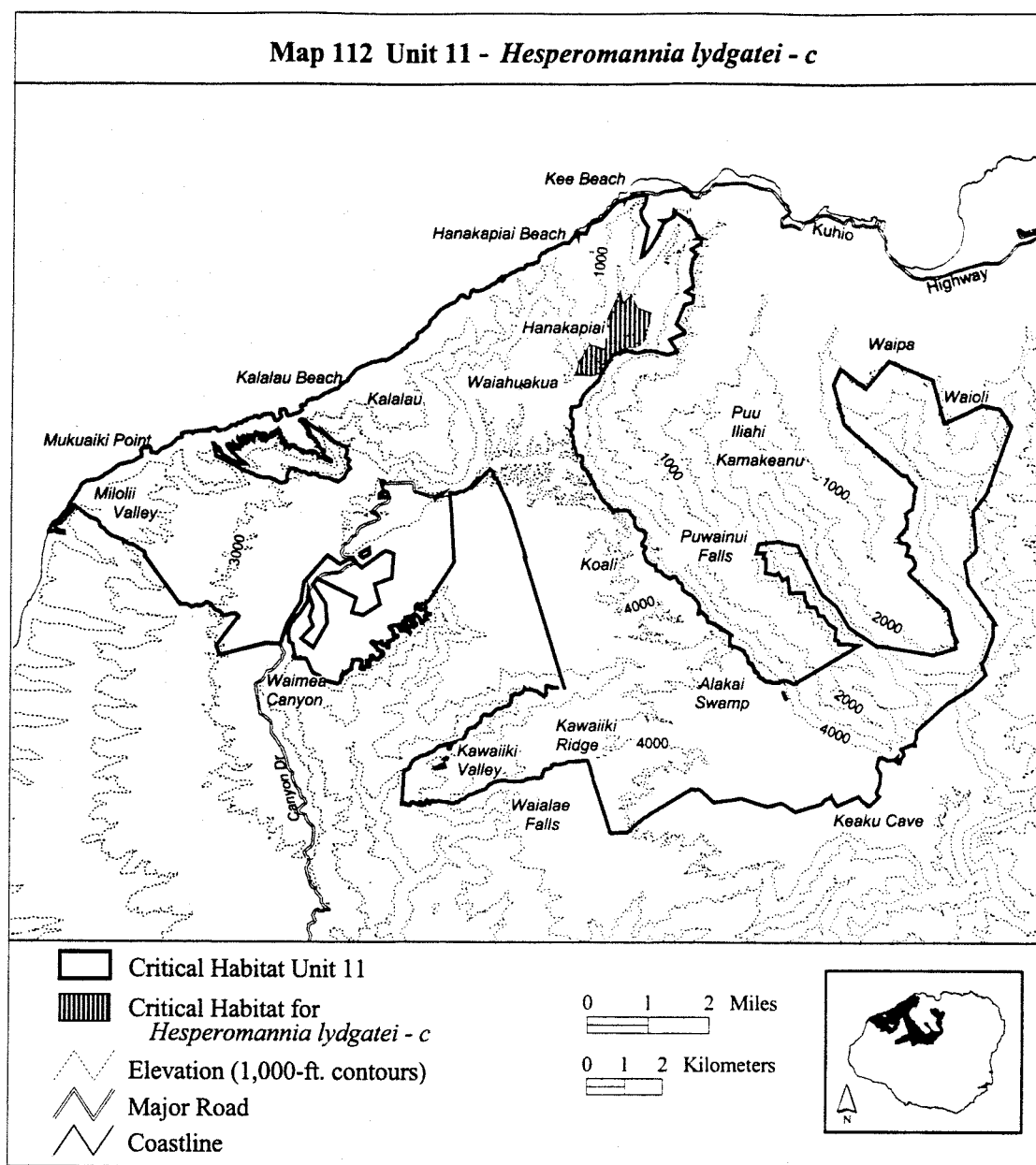
(cxii) Kauai 11—*Hesperomannia lydgatei*—c (180 ha; 444 ac)

(A) Unit consists of the following 63 boundary points: Start at 439257, 2452630; 439170, 2452590; 439025, 2452523; 438546, 2452544; 438629, 2452877; 438900, 2453355; 439316, 2453230; 439378, 2454041; 439711, 2454768; 439733, 2454651; 439774, 2454435; 440003, 2454643; 440169, 2454310; 440536, 2454173; 440533, 2454158; 440523, 2454133; 440509,

2454110; 440485, 2453995; 440492, 2453950; 440484, 2453922; 440461, 2453865; 440450, 2453851; 440432, 2453815; 440421, 2453780; 440412, 2453745; 440410, 2453716; 440404, 2453694; 440384, 2453655; 440378, 2453623; 440380, 2453590; 440370, 2453517; 440363, 2453496; 440355, 2453461; 440350, 2453451; 440333, 2453428; 440315, 2453408; 440288, 2453388; 440275, 2453381; 440244, 2453334; 440223, 2453322; 440199, 2453305; 440147, 2453289; 440119,

2453282; 440093, 2453280; 439987, 2453284; 439962, 2453283; 439924, 2453275; 439905, 2453264; 439787, 2453162; 439724, 2453135; 439639, 2453119; 439600, 2453107; 439553, 2453082; 439503, 2453046; 439481, 2453022; 439473, 2452985; 439464, 2452963; 439414, 2452909; 439390, 2452876; 439355, 2452801; 439333, 2452769; 439311, 2452745; 439279, 2452669; return to starting point.

(B) **Note:** Map 112 follows:



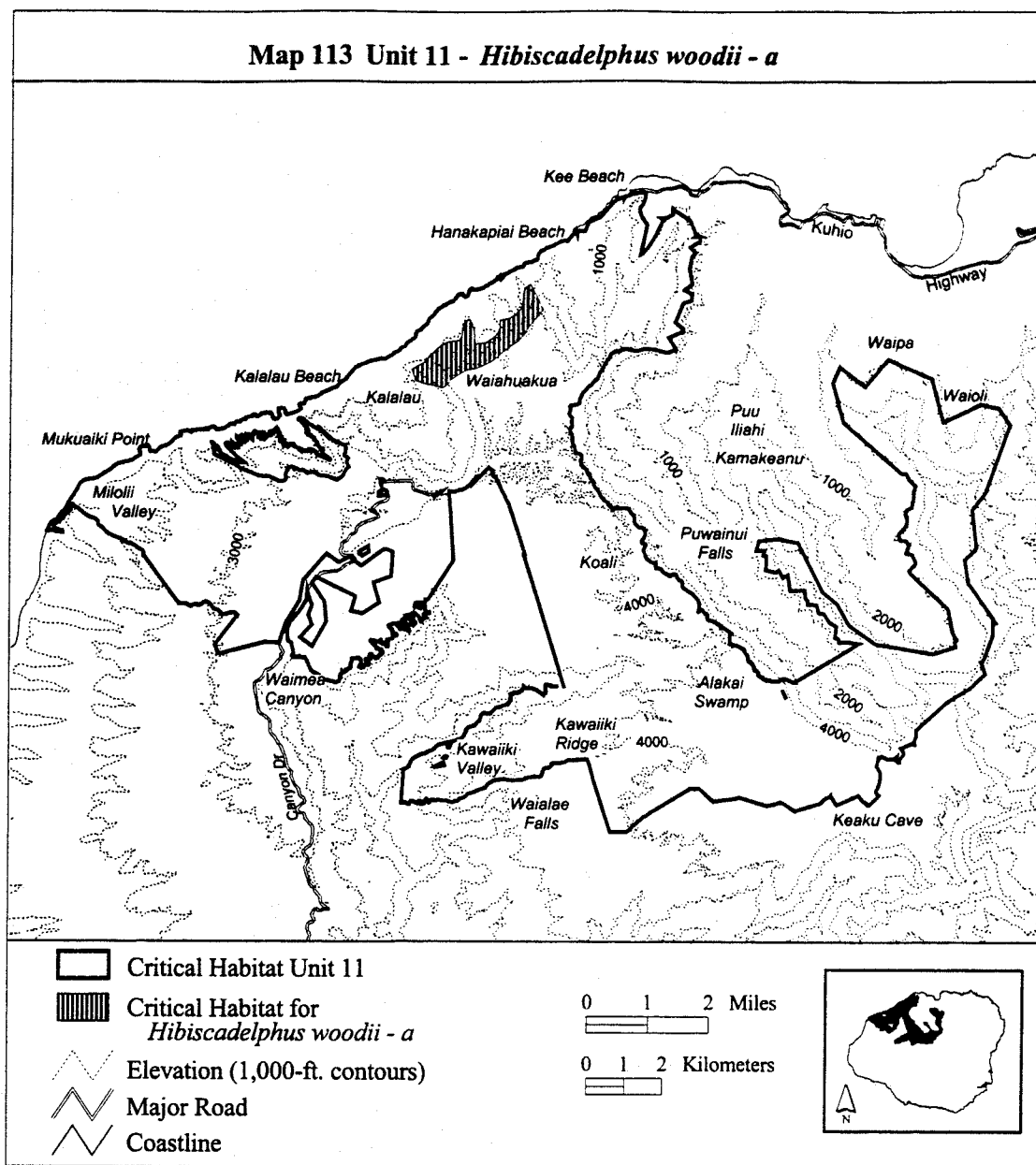
(cxiii) Kauai 11—*Hibiscadelphus woodii*—a (278 ha; 686 ac)

(A) Unit consists of the following 52 boundary points: Start at 437363, 2454888; 437482, 2454647; 437699, 2454229; 437302, 2453742; 437228, 2453583; 437134, 2453505; 437048, 2453382; 437011, 2453374; 436831, 2453251; 436638, 2453088; 436478, 2452949; 436290, 2452826; 435970,

2452683; 435913, 2452666; 435671, 2452621; 435413, 2452470; 435265, 2452364; 435195, 2452253; 435054, 2452153; 434912, 2452191; 434801, 2452221; 434628, 2452243; 434335, 2452343; 434224, 2452634; 434569, 2452839; 434769, 2453060; 434970, 2453248; 435142, 2453350; 435318, 2453395; 435486, 2453407; 435556, 2453530; 435568, 2453678; 435614, 2453870; 435741, 2453972; 435818,

2453862; 435872, 2453677; 435892, 2453485; 435900, 2453366; 435925, 2453325; 436187, 2453346; 436376, 2453473; 436503, 2453604; 436544, 2453710; 436552, 2453845; 436560, 2453947; 436650, 2453964; 436822, 2453996; 436995, 2454115; 437117, 2454254; 437167, 2454479; 437179, 2454676; 437232, 2454790; return to starting point.

(B) **Note:** Map 113 follows:



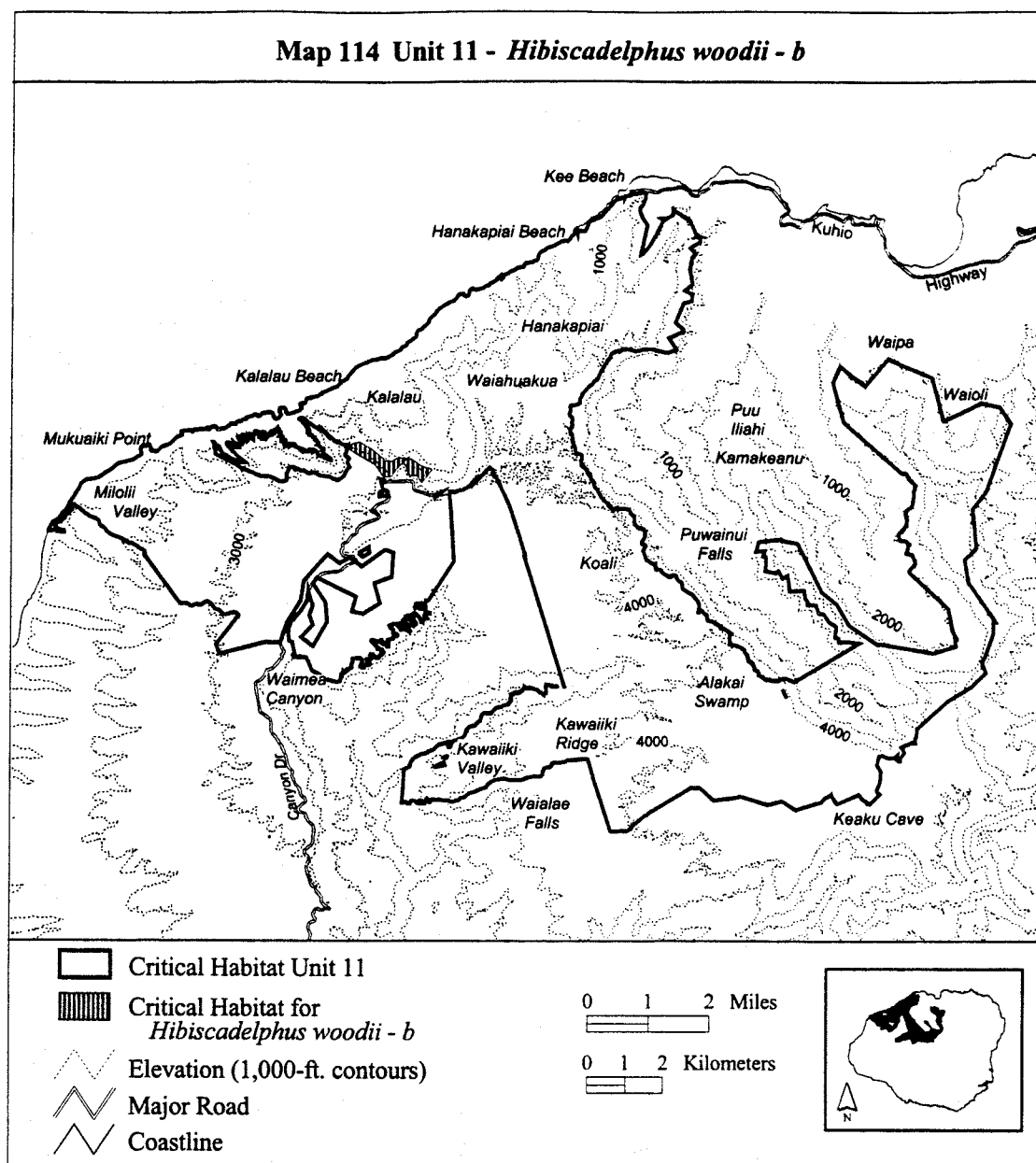
(cxiv) Kauai 11—*Hibiscadelphus woodii*—b (72 ha; 177 ac)

(A) Unit consists of the following 43 boundary points: Start at 432520, 2450579; 432692, 2450669; 432843, 2450694; 432979, 2450628; 433167, 2450501; 433306, 2450399; 433446, 2450268; 433511, 2450202; 433704, 2450174; 433839, 2450268; 434081,

2450272; 434290, 2450198; 434437, 2450087; 434577, 2450030; 434737, 2449985; 434753, 2449956; 434716, 2449895; 434642, 2449793; 434536, 2449666; 434478, 2449604; 434388, 2449772; 434360, 2449817; 434245, 2449793; 434155, 2449817; 434097, 2449952; 434069, 2450079; 434007, 2450116; 433933, 2450104; 433876,

2450039; 433806, 2449940; 433753, 2449875; 433720, 2449817; 433667, 2449777; 433573, 2449772; 433495, 2449768; 433429, 2449830; 433376, 2449928; 433323, 2449994; 433233, 2450104; 433085, 2450194; 432839, 2450334; 432704, 2450432; 432589, 2450481; return to starting point.

(B) **Note:** Map 114 follows:



(cxv) Kauai 11—*Hibiscus waimeae* ssp. *hannerae*—a (1,119 ha; 2,765 ac)

(A) Unit consists of the following 180 boundary points: Start at 439800, 2453173; 439754, 2453167; 439692, 2453157; 439557, 2453163; 439532, 2453165; 439441, 2453172; 439409, 2453191; 439363, 2453165; 439230, 2453162; 439059, 2453162; 438983, 2453175; 438983, 2453064; 438942, 2452919; 438866, 2452802; 438796, 2452700; 438701, 2452574; 438505, 2452615; 438362, 2452644; 438261, 2452688; 438188, 2452770; 438014, 2453046; 437944, 2453242; 437874, 2453406; 437858, 2453641; 437801, 2453891; 437763, 2454052; 437719, 2454160; 437675, 2454356; 437584, 2454153; 437374, 2454005; 437347,

2453974; 437348, 2453973; 437291, 2453729; 437199, 2453502; 437184, 2453467; 437047, 2453328; 436790, 2453211; 436648, 2452900; 436559, 2453068; 436417, 2452923; 436281, 2452768; 436157, 2452689; 435967, 2452657; 435831, 2452635; 435770, 2452632; 435698, 2452682; 435644, 2452701; 435488, 2452477; 435444, 2452338; 435397, 2452296; 435352, 2452293; 435251, 2452328; 434963, 2452515; 434978, 2452588; 435029, 2452702; 435086, 2452679; 435131, 2452688; 435131, 2452688; 435131, 2452688; 435132, 2452688; 435132, 2452689; 435132, 2452689; 435133, 2452689; 435133, 2452689; 435134, 2452690; 435134, 2452690; 435135, 2452690; 435135, 2452690; 435135, 2452690;

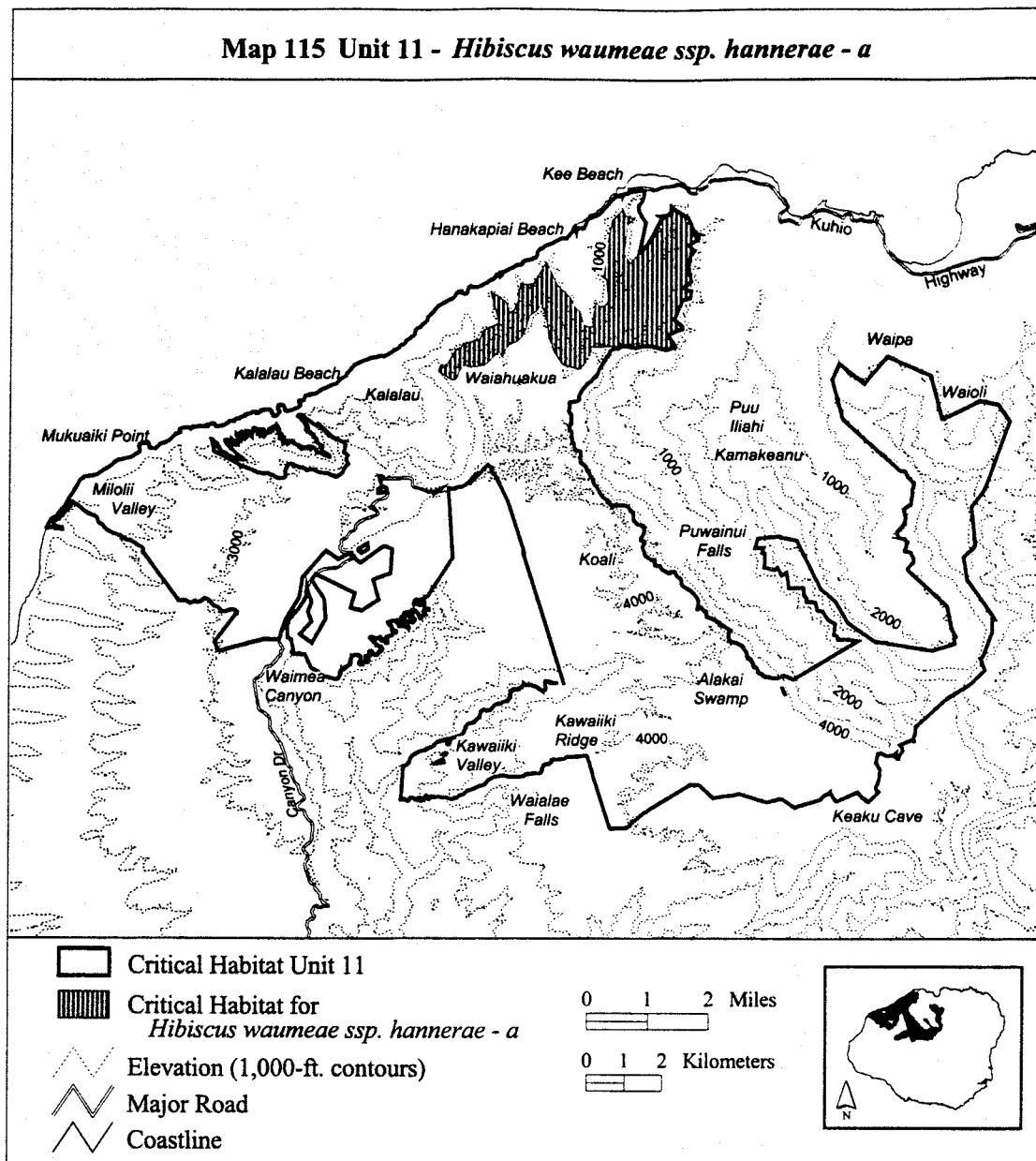
2452690; 435136, 2452690; 435136, 2452691; 435137, 2452691; 435137, 2452691; 435138, 2452691; 435138, 2452691; 435138, 2452691; 435139, 2452691; 435139, 2452692; 435140, 2452692; 435140, 2452692; 435141, 2452692; 435141, 2452692; 435142, 2452692; 435142, 2452692; 435143, 2452692; 435143, 2452692; 435191, 2452717; 435270, 2452863; 435321, 2452945; 435403, 2453072; 435454, 2453129; 435495, 2453141; 435542, 2453151; 435609, 2453249; 435774, 2453290; 436053, 2453389; 436152, 2453608; 436563, 2453790; 436329, 2454620; 436719, 2454372; 436832, 2454059; 436960, 2454143; 436959, 2454144; 437063, 2454388; 437095, 2454691; 437123, 2454847; 437299,

2454806; 437456, 2454831; 437810,
2455391; 438080, 2454797; 438434,
2454464; 438587, 2454169; 438692,
2454087; 438723, 2453966; 438774,
2453808; 438828, 2453723; 438942,
2453681; 439028, 2453685; 439066,
2454067; 439088, 2454131; 439085,
2454138; 439096, 2454216; 439096,
2454271; 439119, 2454321; 439151,
2454295; 439187, 2454235; 439234,
2454221; 439271, 2454221; 439370,
2454258; 439422, 2454331; 439438,
2454388; 439444, 2454416; 439440,

2454421; 439391, 2454938; 439235,
2455037; 439299, 2455455; 439412,
2455858; 439540, 2456495; 439815,
2456763; 439823, 2456771; 439894,
2456601; 440128, 2456530; 439944,
2456367; 439859, 2455603; 440015,
2455348; 440865, 2456289; 440893,
2456544; 441127, 2456650; 441142,
2456810; 441443, 2456623; 441460,
2456466; 441609, 2456381; 441609,
2456254; 441799, 2456137; 441783,
2456137; 441761, 2456132; 441835,
2456125; 441835, 2456004; 441578,

2455834; 441704, 2455698; 441624,
2455592; 441558, 2455280; 441634,
2454883; 441432, 2454722; 441629,
2454611; 441614, 2454455; 441412,
2454395; 441196, 2453892; 441412,
2453696; 441402, 2453646; 441025,
2453470; 441231, 2453168; 440989,
2453082; 440546, 2453183; 440390,
2453178; 440234, 2453133; 440153,
2453118; 439932, 2453184; 439811,
2453179; 439809, 2453180; return to
starting point.

(B) Note: Map 115 follows:



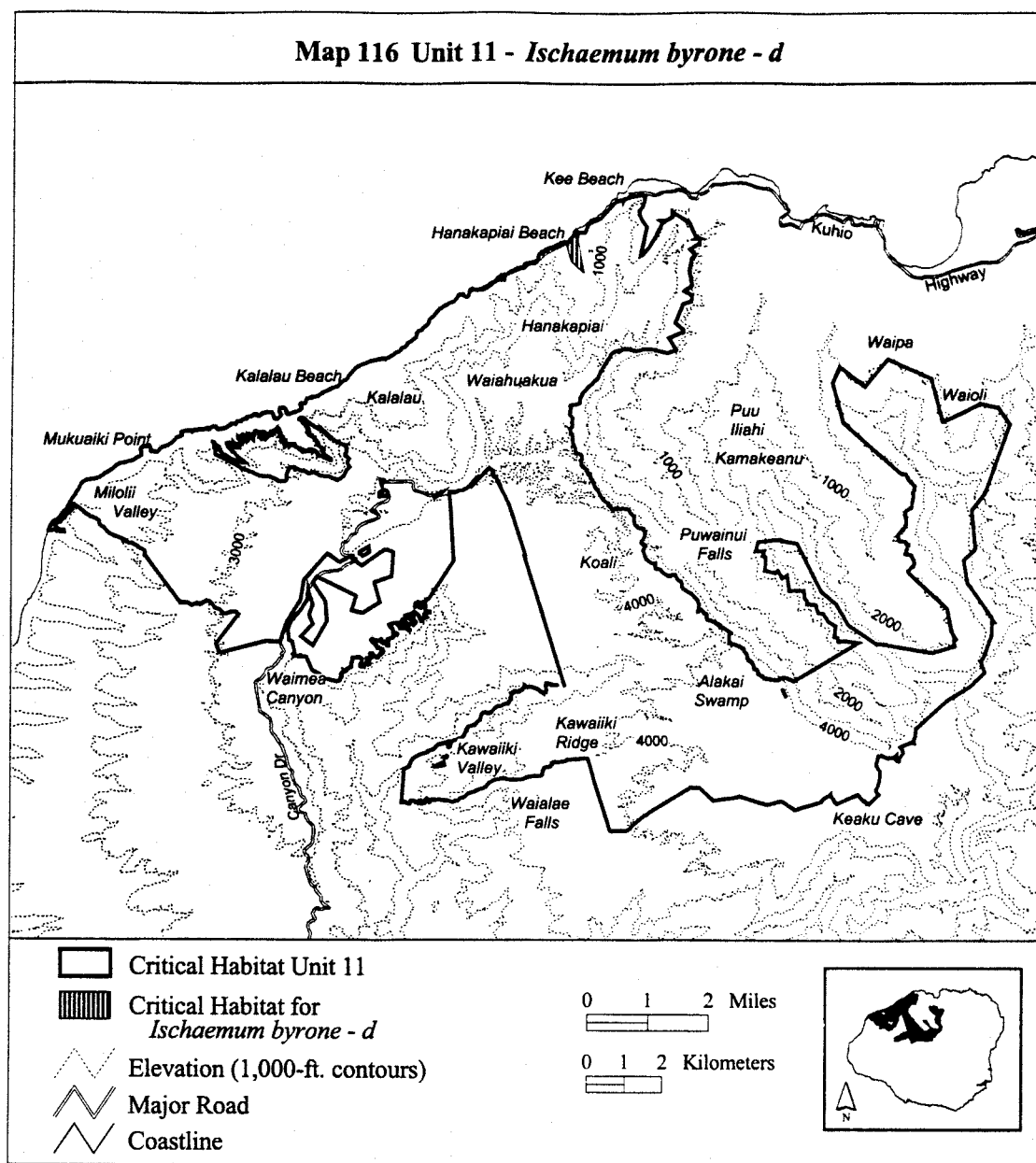
(cxvi) Kauai 11—*Ischaemum byrone*—d
(45 ha; 111 ac)

(A) Unit consists of the following 16
boundary points: coastline; 438535,

2456321; 438601, 2456128; 438762,
2455202; 438425, 2455523; 438279,
2455967; 437712, 2455654; 437482,
2455417; 437305, 2455401; 437190,

2455271; 437106, 2455279; 436707,
2455118; 436684, 2454957; 436524,
2454988; 436179, 2454736; 436046,
2454695; 436030, 2454762; coastline.

(B) Note: Map 116 follows:



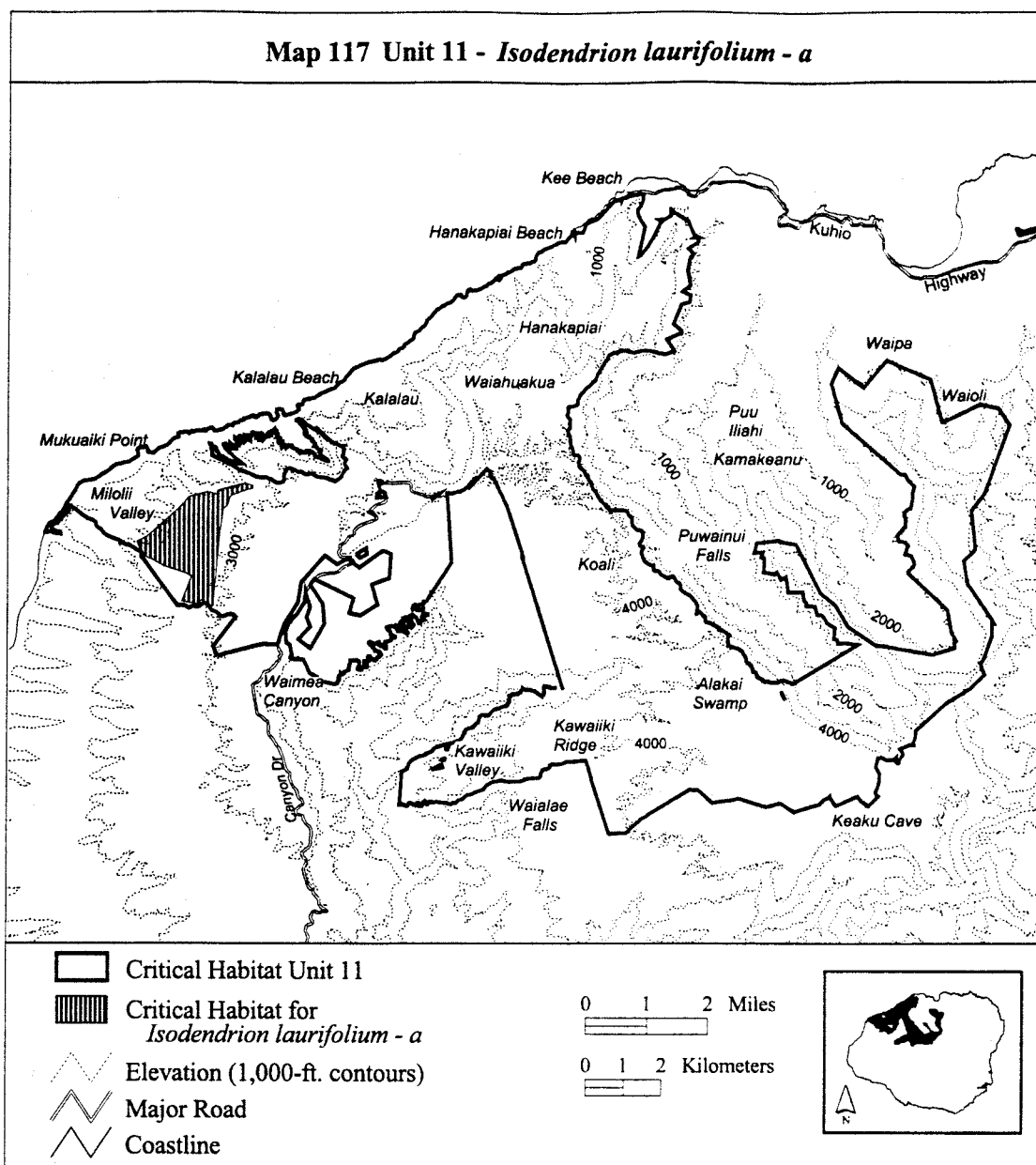
(cxvii) Kauai 11—*Isodendron laurifolium*—a (401 ha; 991 ac)

(A) Unit consists of the following 39 boundary points: Start at 428398, 2449289; 428405, 2449288; 428911, 2449402; 429148, 2449342; 429159, 2449457; 429516, 2449545; 429785, 2449616; 429961, 2449622; 430088,

2449567; 430093, 2449517; 429829, 2449413; 429500, 2449298; 429428, 2449040; 429329, 2448974; 429323, 2448976; 429220, 2448345; 429046, 2446402; 428972, 2446421; 428904, 2446474; 428793, 2446542; 428740, 2446564; 428655, 2446474; 428632, 2446462; 428222, 2446540; 428481, 2447196; 428330, 2447269; 427752,

2447450; 427517, 2447597; 427171, 2447746; 427175, 2447754; 427176, 2447775; 427171, 2447800; 427160, 2447815; 427131, 2447833; 427028, 2448086; 427253, 2448194; 427464, 2448370; 427811, 2448673; 428207, 2449040; return to starting point.

(B) Note: Map 117 follows:



(cxviii) Kauai 11—*Isodendron laurifolium*—b (400 ha; 988 ac)

(A) Unit consists of the following 320 boundary points: Start at 439006, 2444193; 438997, 2444039; 438903, 2443983; 438775, 2443979; 438637, 2443979; 438509, 2444013; 438402, 2443987; 438346, 2443863; 438269, 2443722; 438175, 2443641; 438098, 2443628; 437961, 2443649; 437871, 2443726; 437815, 2443769; 437772, 2443769; 437614, 2443714; 437438, 2443645; 437421, 2443559; 437412, 2443448; 437391, 2443384; 437228, 2443294; 437009, 2443230; 436941, 2443114; 436949, 2443011; 436962, 2442891; 436988, 2442758; 437031, 2442613; 437146, 2442527; 437356, 2442407; 437494, 2442356; 437569,

2442295; 437605, 2442210; 437648, 2442107; 437613, 2441906; 437601, 2441867; 437566, 2441876; 437532, 2441880; 437522, 2441879; 437495, 2441869; 437460, 2441862; 437391, 2441858; 437366, 2441852; 437346, 2441845; 437332, 2441842; 437317, 2441835; 437287, 2441816; 437274, 2441809; 437240, 2441796; 437224, 2441791; 437181, 2441781; 437150, 2441777; 437111, 2441777; 437096, 2441779; 437062, 2441776; 437008, 2441775; 436960, 2441776; 436912, 2441780; 436895, 2441784; 436825, 2441795; 436799, 2441801; 436777, 2441809; 436730, 2441820; 436695, 2441811; 436666, 2441808; 436638, 2441803; 436618, 2441796; 436593, 2441792; 436583, 2441789; 436541,

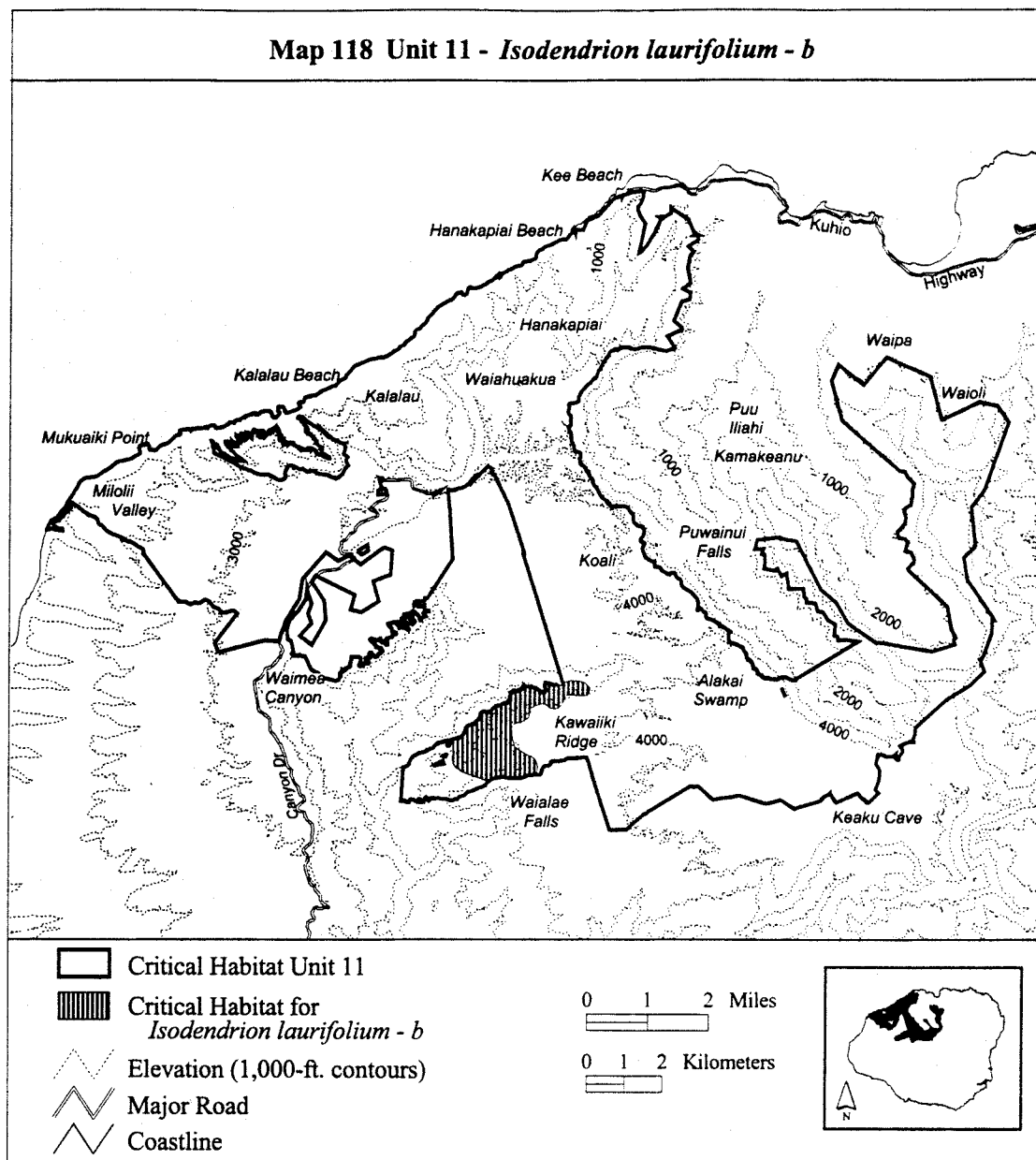
2441785; 436492, 2441773; 436453, 2441759; 436419, 2441739; 436408, 2441737; 436374, 2441718; 436362, 2441711; 436277, 2441726; 435977, 2441829; 435771, 2441906; 435621, 2441970; 435488, 2442048; 435398, 2442150; 435364, 2442279; 435368, 2442352; 435394, 2442442; 435390, 2442519; 435390, 2442630; 435386, 2442776; 435382, 2442812; 435391, 2442814; 435415, 2442819; 435435, 2442826; 435454, 2442831; 435476, 2442838; 435496, 2442844; 435516, 2442850; 435530, 2442853; 435534, 2442855; 435543, 2442858; 435556, 2442862; 435571, 2442867; 435585, 2442876; 435598, 2442885; 435608, 2442891; 435619, 2442899; 435627, 2442904; 435642, 2442920; 435658,

2442932; 435668, 2442948; 435673,
2442959; 435681, 2442977; 435688,
2442995; 435693, 2443006; 435698,
2443024; 435704, 2443036; 435708,
2443047; 435715, 2443064; 435722,
2443078; 435725, 2443086; 435729,
2443093; 435735, 2443103; 435738,
2443112; 435743, 2443127; 435749,
2443138; 435753, 2443149; 435757,
2443155; 435766, 2443169; 435778,
2443179; 435790, 2443186; 435804,
2443188; 435821, 2443194; 435842,
2443199; 435861, 2443202; 435874,
2443204; 435889, 2443208; 435904,
2443211; 435933, 2443223; 435942,
2443232; 435949, 2443246; 435958,
2443255; 435969, 2443263; 435979,
2443271; 435993, 2443281; 436010,
2443297; 436032, 2443316; 436048,
2443332; 436064, 2443343; 436080,
2443358; 436089, 2443375; 436095,
2443390; 436100, 2443403; 436107,
2443421; 436113, 2443456; 436118,
2443477; 436123, 2443502; 436134,
2443520; 436146, 2443534; 436160,
2443543; 436175, 2443554; 436190,
2443560; 436213, 2443563; 436227,
2443563; 436240, 2443562; 436254,
2443557; 436265, 2443552; 436274,
2443547; 436287, 2443540; 436300,
2443537; 436315, 2443532; 436328,
2443529; 436337, 2443528; 436348,
2443531; 436357, 2443536; 436369,
2443546; 436380, 2443558; 436392,
2443572; 436403, 2443585; 436421,
2443611; 436438, 2443631; 436460,
2443655; 436478, 2443676; 436497,

2443688; 436518, 2443696; 436534,
2443700; 436558, 2443707; 436576,
2443711; 436597, 2443714; 436611,
2443716; 436630, 2443718; 436644,
2443720; 436655, 2443724; 436666,
2443731; 436678, 2443742; 436697,
2443756; 436708, 2443763; 436726,
2443769; 436745, 2443772; 436758,
2443775; 436771, 2443776; 436788,
2443776; 436799, 2443778; 436808,
2443781; 436818, 2443785; 436823,
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2443807; 436852, 2443819; 436861,
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2443900; 436911, 2443923; 436914,
2443936; 436914, 2443948; 436913,
2443962; 436910, 2443981; 436908,
2443995; 436908, 2444013; 436911,
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2444065; 436951, 2444073; 436961,
2444084; 436969, 2444094; 436975,
2444098; 436983, 2444102; 436994,
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2444105; 437049, 2444100; 437067,
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2444090; 437119, 2444096; 437128,
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2444122; 437144, 2444130; 437156,
2444135; 437169, 2444141; 437183,
2444150; 437191, 2444154; 437202,
2444165; 437212, 2444177; 437228,
2444198; 437239, 2444213; 437245,
2444227; 437254, 2444239; 437263,
2444246; 437278, 2444240; 437294,

2444234; 437310, 2444225; 437332,
2444217; 437351, 2444217; 437370,
2444223; 437391, 2444223; 437412,
2444226; 437428, 2444226; 437445,
2444223; 437462, 2444219; 437482,
2444211; 437497, 2444205; 437541,
2444190; 437563, 2444183; 437578,
2444179; 437593, 2444170; 437610,
2444160; 437624, 2444146; 437636,
2444132; 437651, 2444119; 437671,
2444112; 437691, 2444102; 437703,
2444093; 437722, 2444082; 437732,
2444069; 437749, 2444061; 437758,
2444058; 437768, 2444060; 437780,
2444066; 437810, 2444080; 437821,
2444088; 437831, 2444100; 437833,
2444111; 437835, 2444126; 437833,
2444139; 437827, 2444163; 437822,
2444185; 437820, 2444206; 437818,
2444236; 437824, 2444265; 437828,
2444292; 437836, 2444314; 437843,
2444322; 437854, 2444327; 437871,
2444328; 437887, 2444323; 437909,
2444314; 437933, 2444302; 437960,
2444289; 437984, 2444274; 438007,
2444260; 438028, 2444258; 438048,
2444258; 438072, 2444260; 438087,
2444266; 438109, 2444271; 438133,
2444273; 438164, 2444270; 438196,
2444263; 438335, 2444214; 438294,
2444342; 438355, 2444334; 438488,
2444377; 438732, 2444360; 438787,
2444347; 438895, 2444313; return to
starting point.

(B) **Note:** Map 118 follows:



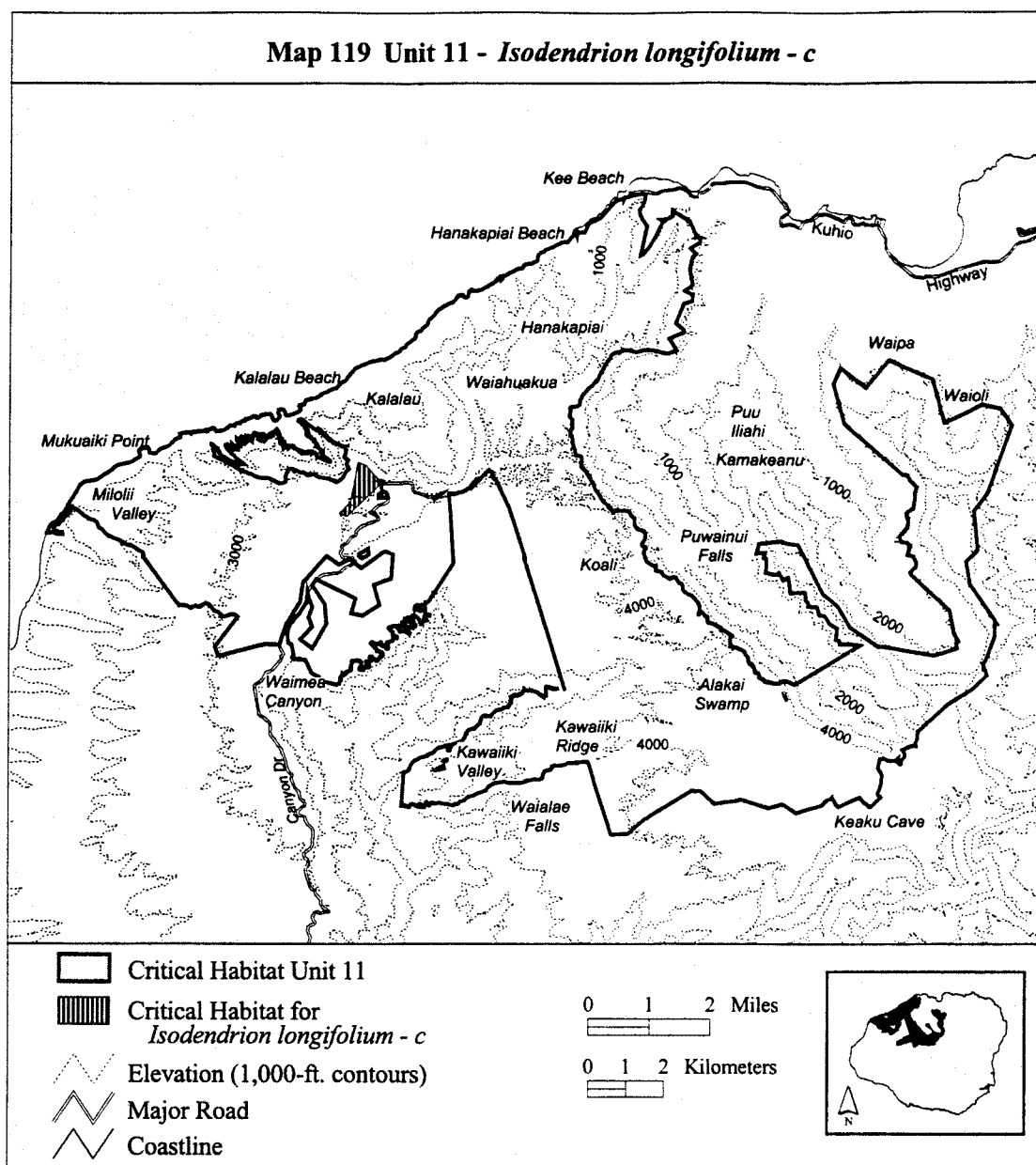
(cxix) Kauai 11—*Isodendron longifolium*—c (59 ha; 146 ac)

(A) Unit consists of the following 12 boundary points: Start at 432793,

2450043; 432799, 2450073; 432822, 2450200; 432971, 2450144; 433043, 2450118; 433310, 2449821; 433426, 2449707; 433399, 2449709; 433414,

2449628; 432530, 2448758; 432335, 2448851; 432630, 2449144; return to starting point.

(B) **Note:** Map 119 follows:



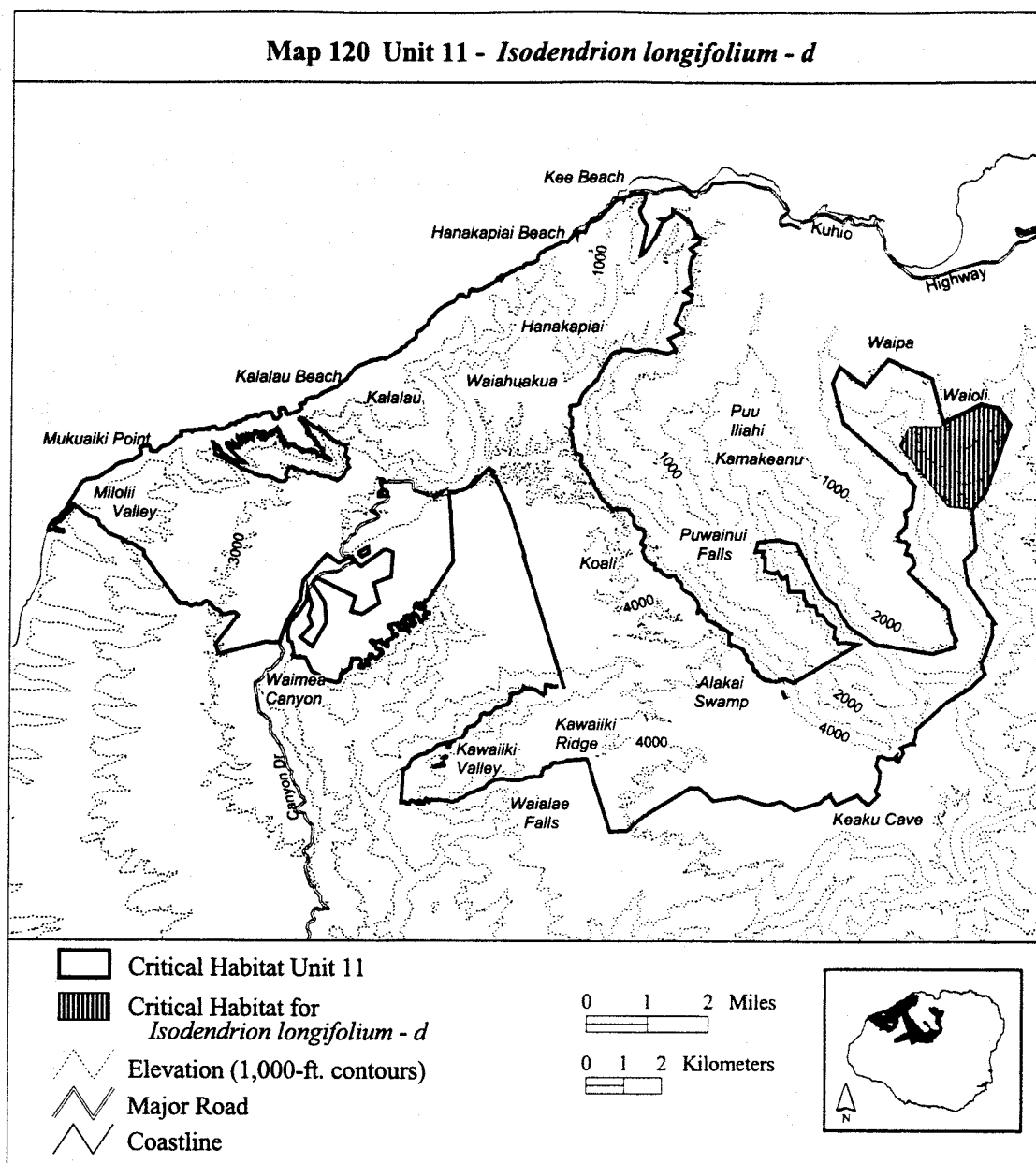
(cxx) Kauai 11—*Isodendron longifolium*—d (493 ha; 1,218 ac)

(A) Unit consists of the following 16 boundary points: Start at 449855,

2451511; 450071, 2451219; 449928, 2450811; 449449, 2449480; 449073, 2448969; 449073, 2448966; 448431, 2449017; 447240, 2450530; 447143, 2450657; 447406, 2451160; 447518,

2451166; 448229, 2451166; 448981, 2451592; 449257, 2451734; 449665, 2451685; 449738, 2451669; return to starting point.

(B) **Note:** Map 120 follows:



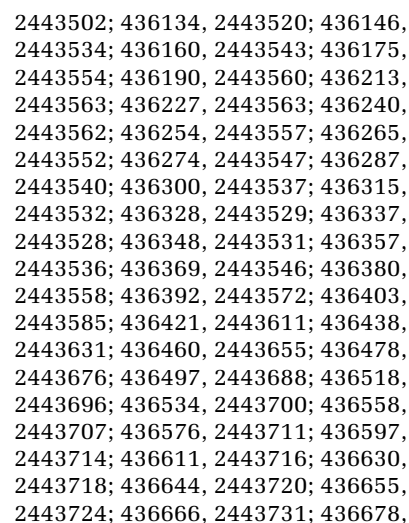
(cxxi) Kauai 11—*Isodendron longifolium*—e (381 ha; 941 ac)

(A) Unit consists of the following 68 boundary points: Start at 439819, 2453189; 439579, 2453181; 439568, 2453181; 438996, 2453168; 438990, 2453040; 438932, 2452880; 438715, 2452573; 438651, 2452573; 438247, 2452701; 438151, 2452817; 438029, 2453034; 437888, 2453367; 437856, 2453610; 437760, 2454032; 437658, 2454372; 437626, 2454410; 437568, 2454359; 437427, 2454103; 437389,

2454054; 437334, 2453949; 437268, 2454075; 437222, 2454245; 437297, 2454346; 437277, 2454462; 437175, 2454700; 437209, 2454781; 437465, 2454839; 437933, 2454775; 438708, 2454103; 438727, 2453962; 438766, 2453795; 438830, 2453706; 439003, 2453693; 439035, 2453846; 439035, 2454026; 439080, 2454269; 439150, 2454345; 439208, 2454256; 439355, 2454288; 439445, 2454461; 439464, 2454563; 439730, 2454563; 440002, 2454563; 440423, 2454521; 440294, 2454127; 440493, 2454062; 440438,

2453967; 440361, 2453776; 440361, 2453571; 440372, 2453534; 440370, 2453517; 440363, 2453496; 440355, 2453461; 440350, 2453451; 440333, 2453428; 440315, 2453408; 440288, 2453388; 440275, 2453381; 440244, 2453334; 440223, 2453322; 440199, 2453305; 440147, 2453289; 440119, 2453282; 440093, 2453280; 439987, 2453284; 439962, 2453283; 439924, 2453275; 439905, 2453264; return to starting point.

(B) **Note:** Map 121 follows:

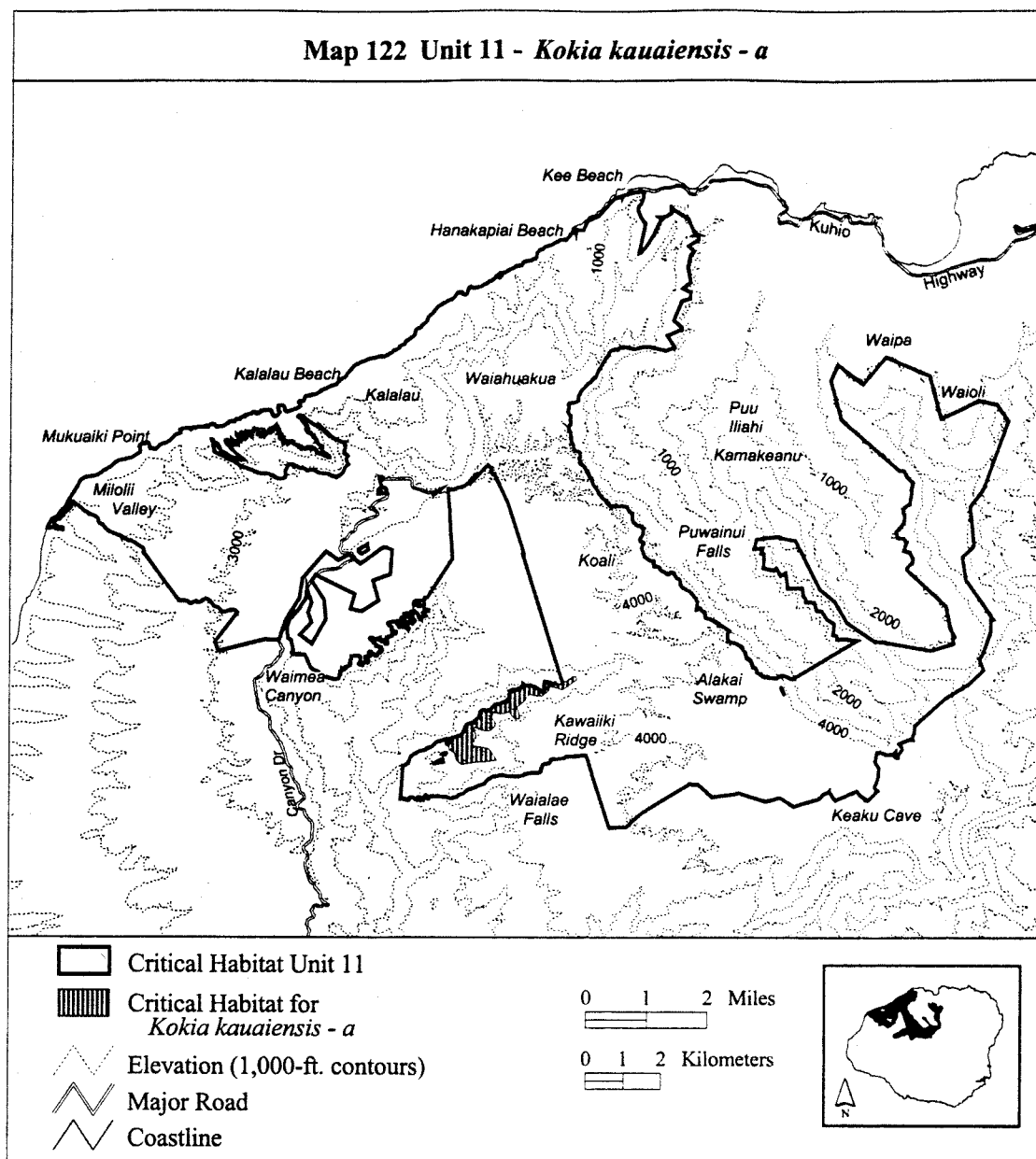


2443742; 436697, 2443756; 436708,
2443763; 436726, 2443769; 436745,
2443772; 436758, 2443775; 436771,
2443776; 436788, 2443776; 436799,
2443778; 436808, 2443781; 436818,
2443785; 436823, 2443786; 436829,
2443790; 436837, 2443797; 436841,
2443801; 436845, 2443807; 436852,
2443819; 436861, 2443831; 436870,
2443847; 436882, 2443863; 436890,
2443877; 436900, 2443900; 436911,
2443923; 436914, 2443936; 436914,
2443948; 436913, 2443962; 436910,
2443981; 436908, 2443995; 436908,
2444013; 436911, 2444027; 436918,
2444040; 436926, 2444047; 436933,
2444055; 436942, 2444065; 436951,
2444073; 436961, 2444084; 436969,
2444094; 436975, 2444098; 436983,
2444102; 436994, 2444107; 437009,
2444108; 437026, 2444105; 437049,
2444100; 437067, 2444092; 437076,
2444089; 437106, 2444090; 437119,
2444096; 437128, 2444104; 437133,
2444112; 437137, 2444122; 437144,
2444130; 437156, 2444135; 437169,
2444141; 437183, 2444150; 437191,
2444154; 437202, 2444165; 437212,
2444177; 437228, 2444198; 437239,
2444213; 437245, 2444227; 437254,
2444239; 437263, 2444246; 437278,

2444240; 437294, 2444234; 437310,
2444225; 437332, 2444217; 437351,
2444217; 437370, 2444223; 437391,
2444223; 437412, 2444226; 437428,
2444226; 437445, 2444223; 437462,
2444219; 437482, 2444211; 437497,
2444205; 437541, 2444190; 437563,
2444183; 437578, 2444179; 437593,
2444170; 437610, 2444160; 437624,
2444146; 437636, 2444132; 437651,
2444119; 437671, 2444112; 437691,
2444102; 437703, 2444093; 437722,
2444082; 437732, 2444069; 437749,
2444061; 437758, 2444058; 437768,
2444060; 437780, 2444066; 437810,
2444080; 437821, 2444088; 437831,
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2444163; 437822, 2444185; 437820,
2444206; 437818, 2444236; 437824,
2444265; 437828, 2444292; 437836,
2444314; 437843, 2444322; 437854,
2444327; 437871, 2444328; 437887,
2444323; 437909, 2444314; 437933,
2444302; 437960, 2444289; 437984,
2444274; 438007, 2444260; 438028,
2444258; 438048, 2444258; 438072,
2444260; 438087, 2444266; 438109,
2444271; 438133, 2444273; 438164,
2444270; 438196, 2444263; 438335,
2444214; 438301, 2444319; 438397,

2444313; 438592, 2444451; 438657,
2444444; 438672, 2444357; 438317,
2444096; 438078, 2444169; 437969,
2444183; 437940, 2444089; 437897,
2444038; 437759, 2443930; 437658,
2443937; 437505, 2443959; 437433,
2443973; 437310, 2443806; 437194,
2443712; 437092, 2443618; 437136,
2443502; 437179, 2443386; 437165,
2443328; 437056, 2443328; 436969,
2443401; 436933, 2443437; 436911,
2443517; 436730, 2443459; 436643,
2443452; 436513, 2443510; 436433,
2443372; 436428, 2443340; 436447,
2443339; 436521, 2443215; 436516,
2443118; 436436, 2443037; 436319,
2442983; 436198, 2443018; 436044,
2443075; 435968, 2443092; 435954,
2443025; 436027, 2442845; 435961,
2442776; 435920, 2442719; 435916,
2442648; 435965, 2442591; 436089,
2442570; 436229, 2442546; 436345,
2442534; 436417, 2442451; 436557,
2442214; 436200, 2442166; 436089,
2442159; 435837, 2442138; 435657,
2442104; 435578, 2442135; 435488,
2442216; 435441, 2442399; 435320,
2442501; 435244, 2442641; 435284,
2442631; return to starting point.

(B) Note: Map 122 follows:



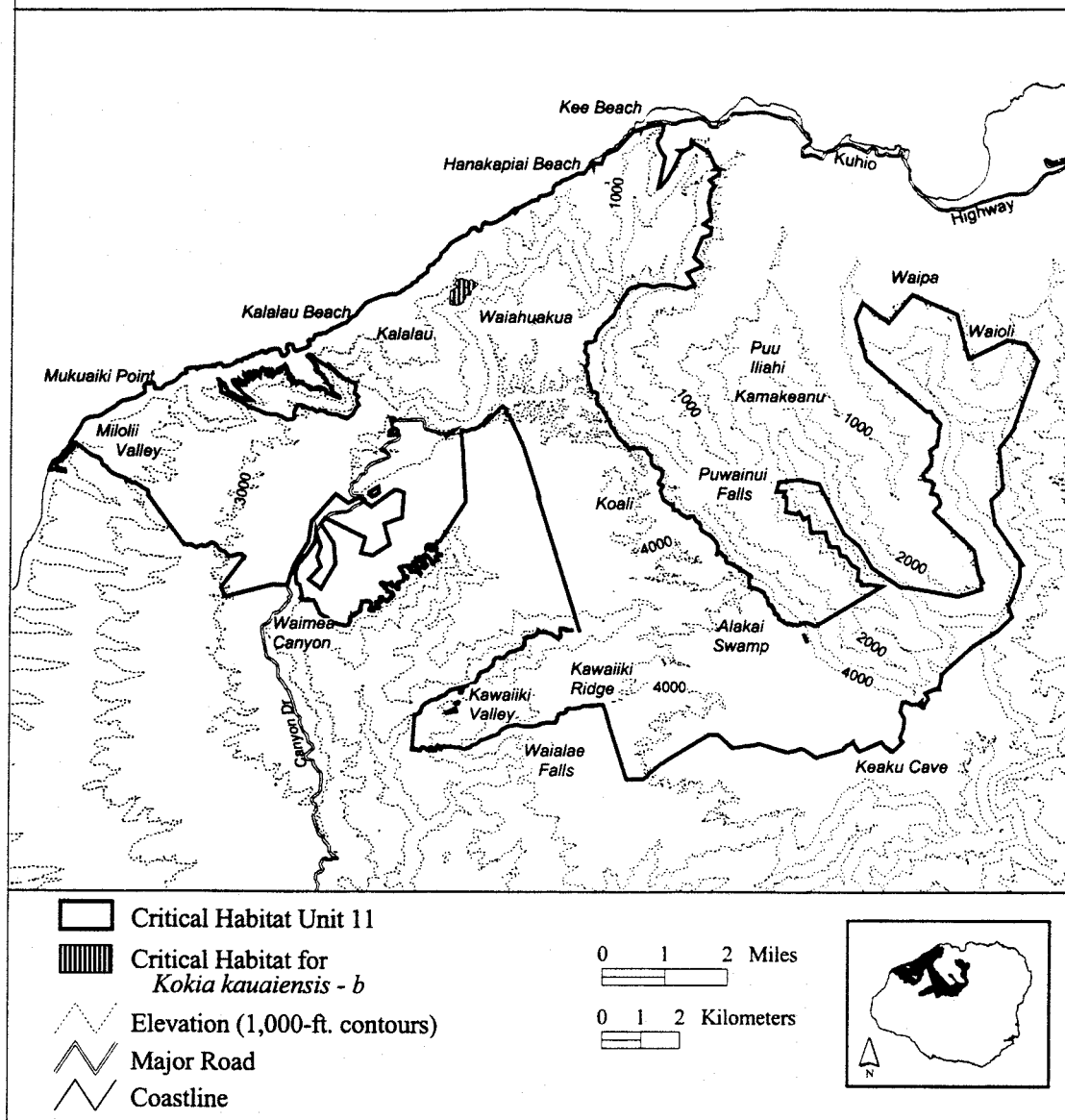
(cxxiii) Kauai 11—*Kokia kauaiensis*—b
(30 ha; 74 ac)

(A) Unit consists of the following 54 boundary points: Start at 435047, 2453176; 435038, 2453207; 435043, 2453230; 435058, 2453257; 435101, 2453291; 435145, 2453300; 435165, 2453304; 435176, 2453317; 435166, 2453322; 435166, 2453344; 435180, 2453345; 435202, 2453340; 435247, 2453319; 435294, 2453296; 435330,

2453290; 435354, 2453284; 435385, 2453266; 435395, 2453260; 435412, 2453266; 435433, 2453285; 435451, 2453304; 435463, 2453300; 435533, 2453250; 435651, 2453203; 435601, 2453135; 435551, 2453094; 435476, 2453038; 435457, 2452994; 435458, 2452931; 435428, 2452886; 435384, 2452889; 435354, 2452910; 435334, 2452903; 435320, 2452860; 435308, 2452793; 435265, 2452778; 435249,

2452760; 435231, 2452714; 435212, 2452666; 435180, 2452651; 435149, 2452645; 435048, 2452639; 434944, 2452655; 434906, 2452674; 434899, 2452697; 434904, 2452924; 434927, 2453016; 434958, 2453016; 435012, 2453066; 435029, 2453085; 435052, 2453083; 435086, 2453084; 435092, 2453120; 435071, 2453148; return to starting point.

(B) **Note:** Map 123 follows:

Map 123 Unit 11 - *Kokia kauaiensis* - b

(cxxiv) Kauai 11—*Kokia kauaiensis*—c
(667 ha; 1,647 ac)

(A) Unit consists of the following 43 boundary points: Start at 426834, 2447995; 426824, 2448315; 427350, 2448274; 427355, 2448413; 427360, 2448542; 427618, 2448645; 427973, 2449036; 428190, 2449221; 428282, 2449268; 428566, 2449160; 428787,

2449046; 428885, 2449062; 428912, 2449075; 430225, 2448294; 430075, 2448099; 429914, 2447762; 430322, 2447000; 430283, 2446894; 429631, 2446128; 429468, 2446319; 429267, 2446382; 429075, 2446396; 428941, 2446434; 428749, 2446569; 428619, 2446458; 428049, 2446487; 427178, 2447664; 427161, 2447669; 427157,

2447676; 427157, 2447711; 427175, 2447754; 427176, 2447775; 427171, 2447800; 427160, 2447815; 427124, 2447837; 427084, 2447847; 427039, 2447867; 426997, 2447892; 426981, 2447902; 426958, 2447923; 426944, 2447941; 426907, 2447965; 426847, 2447992; return to starting point.

(B) Note: Map 124 follows:

Map 124 Unit 11 - *Kokia kauaiensis* - c

The map displays the island of Kauai with Unit 11 highlighted. Key locations include Kee Beach, Hanakapi'ai Beach, Kalalau Beach, Mukuiaiki Point, Milolii Valley, Waimea Canyon, Kawaiiki Valley, Waialeale Falls, Kawaiiki Ridge, Alakai Swamp, Puu Iliahi, Kamakee, Puu Iliahi, Waipa, Waioli, and Keaku Cave. Elevation contours are shown at 1,000-foot intervals. Major roads and the coastline are also indicated.

Legend:

- Critical Habitat Unit 11
- Critical Habitat for *Kokia kauaiensis* - c
- Elevation (1,000-ft. contours)
- Major Road
- Coastline

Scale:

- 0 1 2 Miles
- 0 1 2 Kilometers

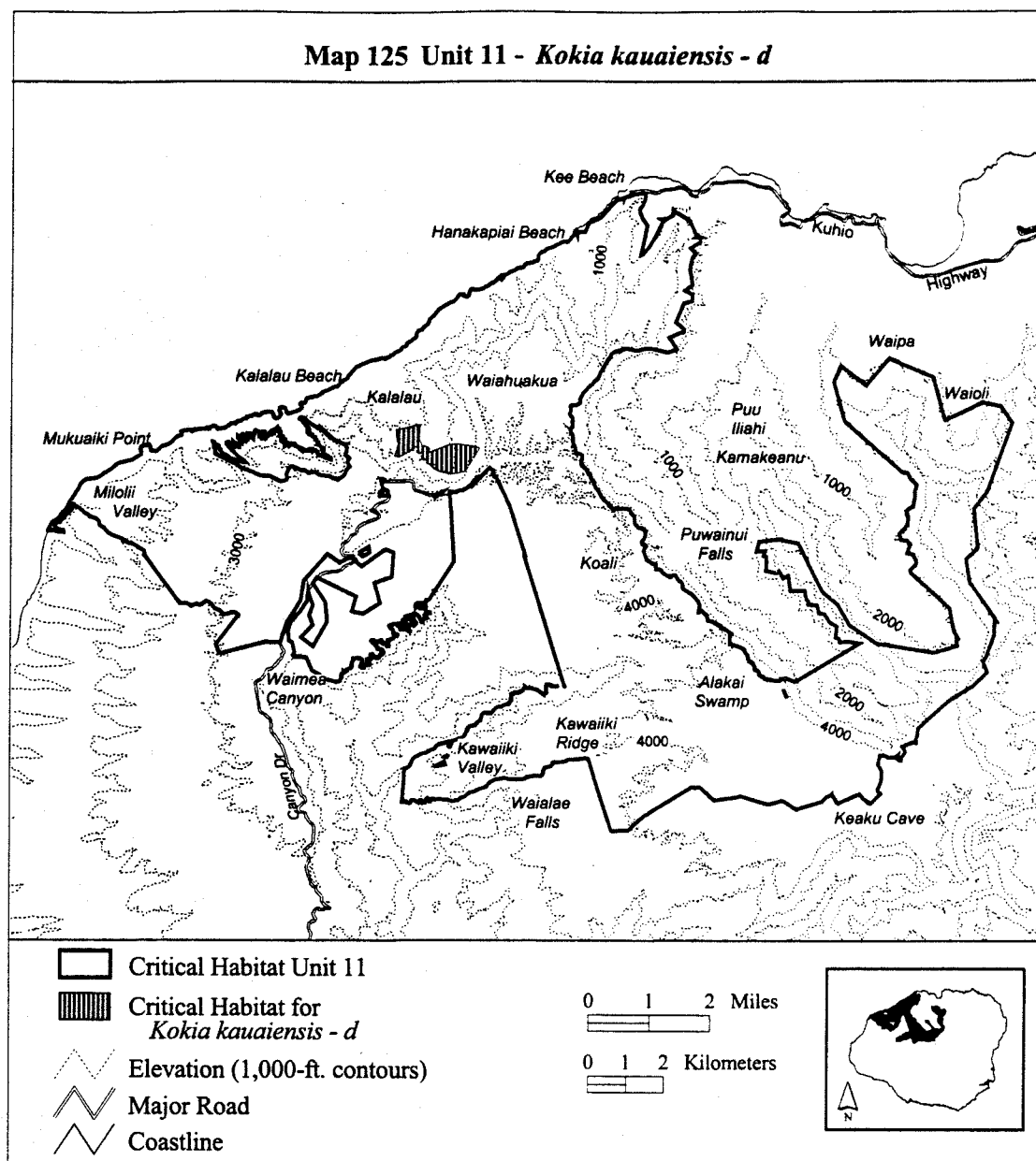
Inset Map:

Shows the location of Unit 11 on the island of Kauai.

(A) Unit consists of the following 39 boundary points: Start at 433942, 2450326; 433919, 2450316; 433897, 2450291; 433798, 2450316; 433790, 2450354; 433815, 2450483; 433861, 2450632; 433808, 2450794; 433798,

2449931; 434795, 2450008; 434633,
2450148; 434626, 2450212; 434566,
2450245; 434481, 2450245; 434512,
2450334; 434526, 2450381; 434443,
2450405; 434392, 2450424; 434382,
2450448; 434359, 2450589; 434355,
2450584; return to starting point.

(B) **Note:** Map 125 follows:



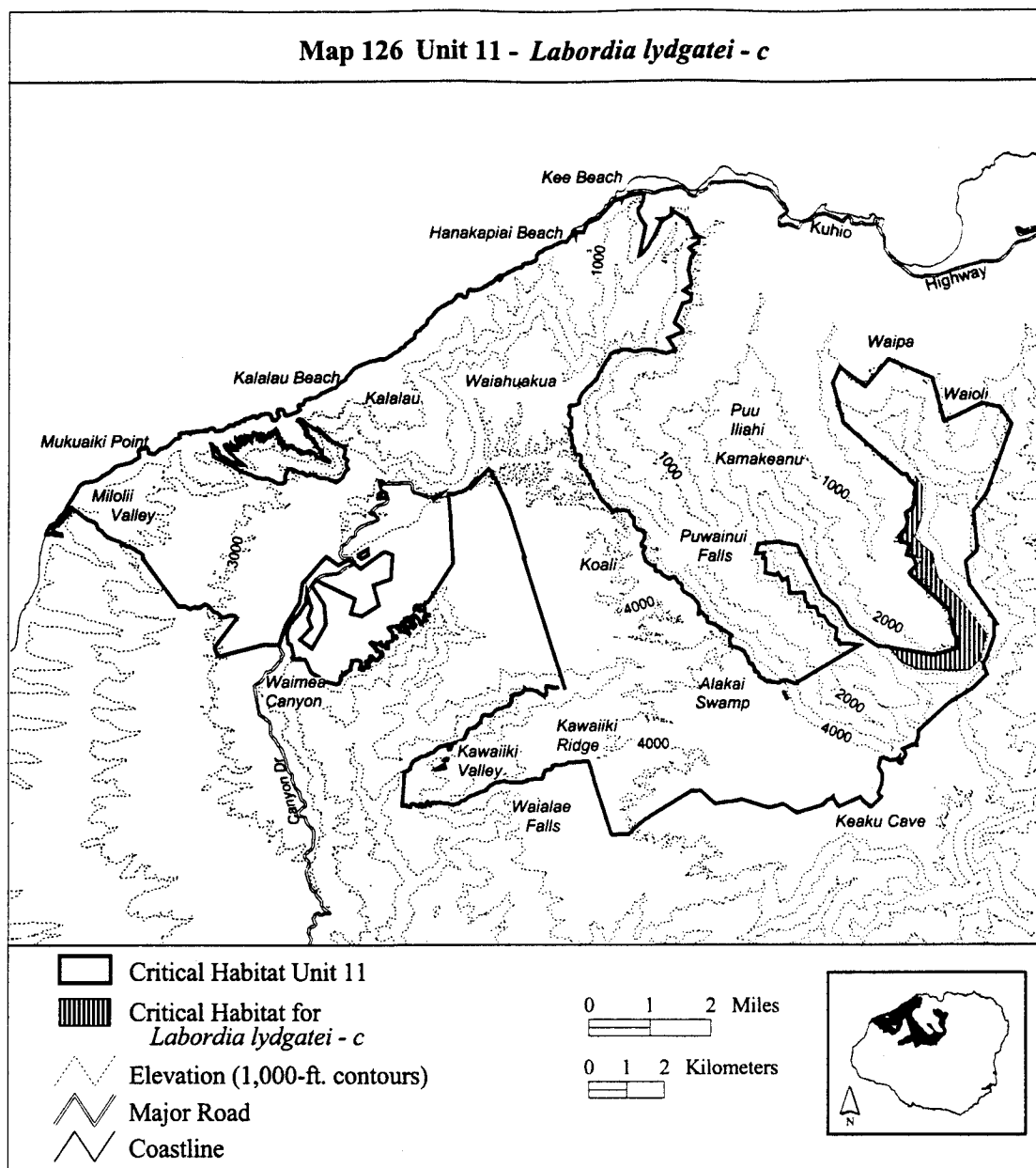
(cxxvi) Kauai 11—*Labordia lydgatei*—c (325 ha; 803 ac)

(A) Unit consists of the following 37 boundary points: Start at 447594, 2447520; 447758, 2447683; 447472, 2447746; 447323, 2447780; 447420, 2448093; 447153, 2448108; 447107, 2448255; 447371, 2448552; 447293,

2448807; 447329, 2448906; 447468, 2449010; 447589, 2449589; 447461, 2449701; 447554, 2449852; 447733, 2449589; 447709, 2448696; 447516, 2448238; 447673, 2448097; 447975, 2447828; 448168, 2447176; 448240, 2447107; 448748, 2446621; 449448, 2445704; 449279, 2445028; 448989,

2444738; 448289, 2444739; 447637, 2444763; 447202, 2444956; 446885, 2445349; 448070, 2445147; 448658, 2445334; 448629, 2445470; 448699, 2445511; 448577, 2445718; 448450, 2446319; 447413, 2447271; 447397, 2447323; return to starting point.

(B) **Note:** Map 126 follows:



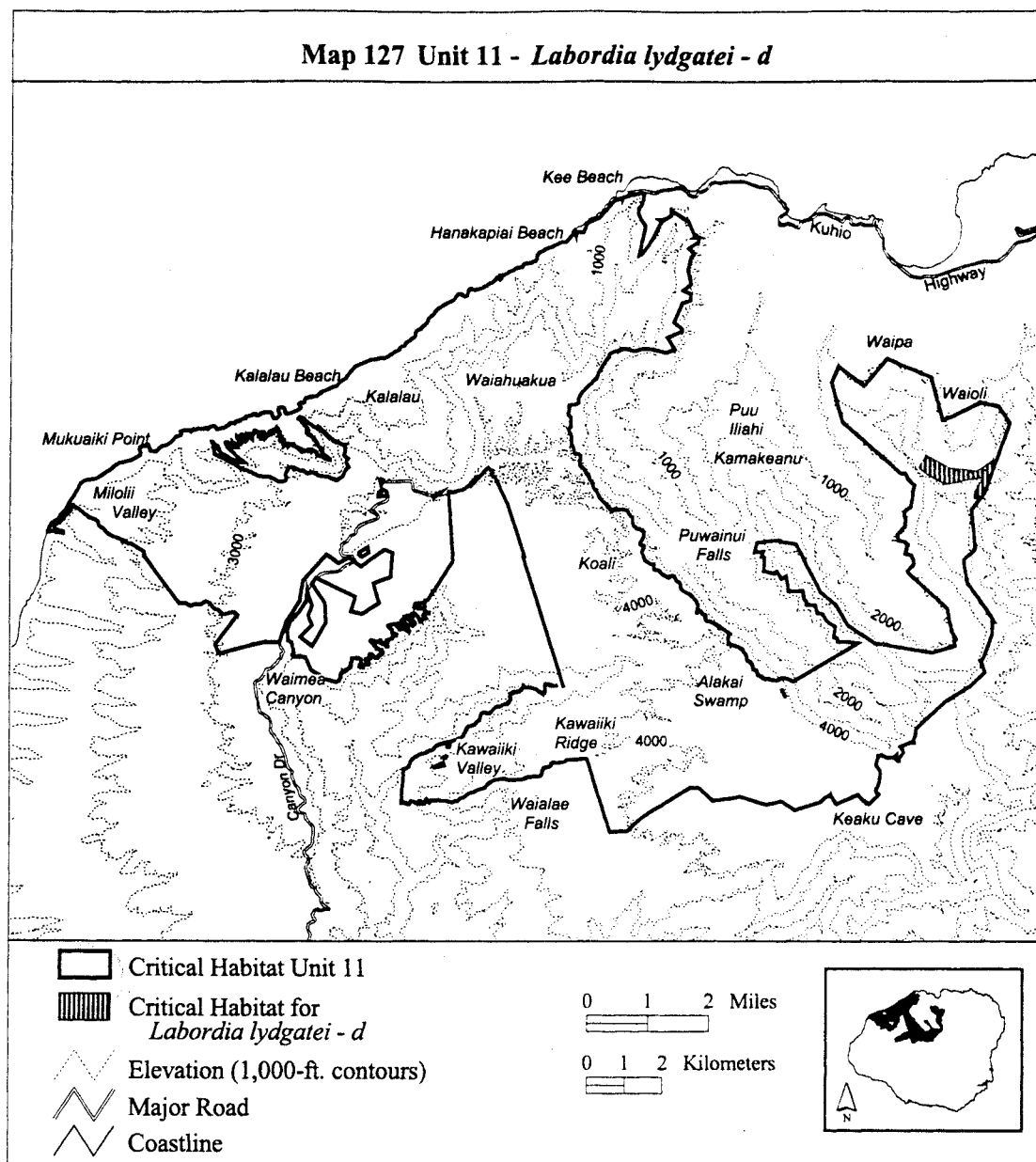
(cxxvii) Kauai 11—*Labordia lydgatei*—d
(82 ha; 203 ac)

(A) Unit consists of the following 18
boundary points: Start at 447872,
2450364; 448482, 2450047; 449119,

2449962; 449207, 2449950; 449624,
2450214; 449665, 2450240; 449712,
2450194; 449432, 2449395; 449310,
2449234; 449214, 2449211; 449158,
2449396; 449395, 2449797; 449400,

2449806; 449060, 2449740; 448772,
2449685; 448385, 2449589; 447902,
2449855; 447675, 2450047; return to
starting point.

(B) **Note:** Map 127 follows:



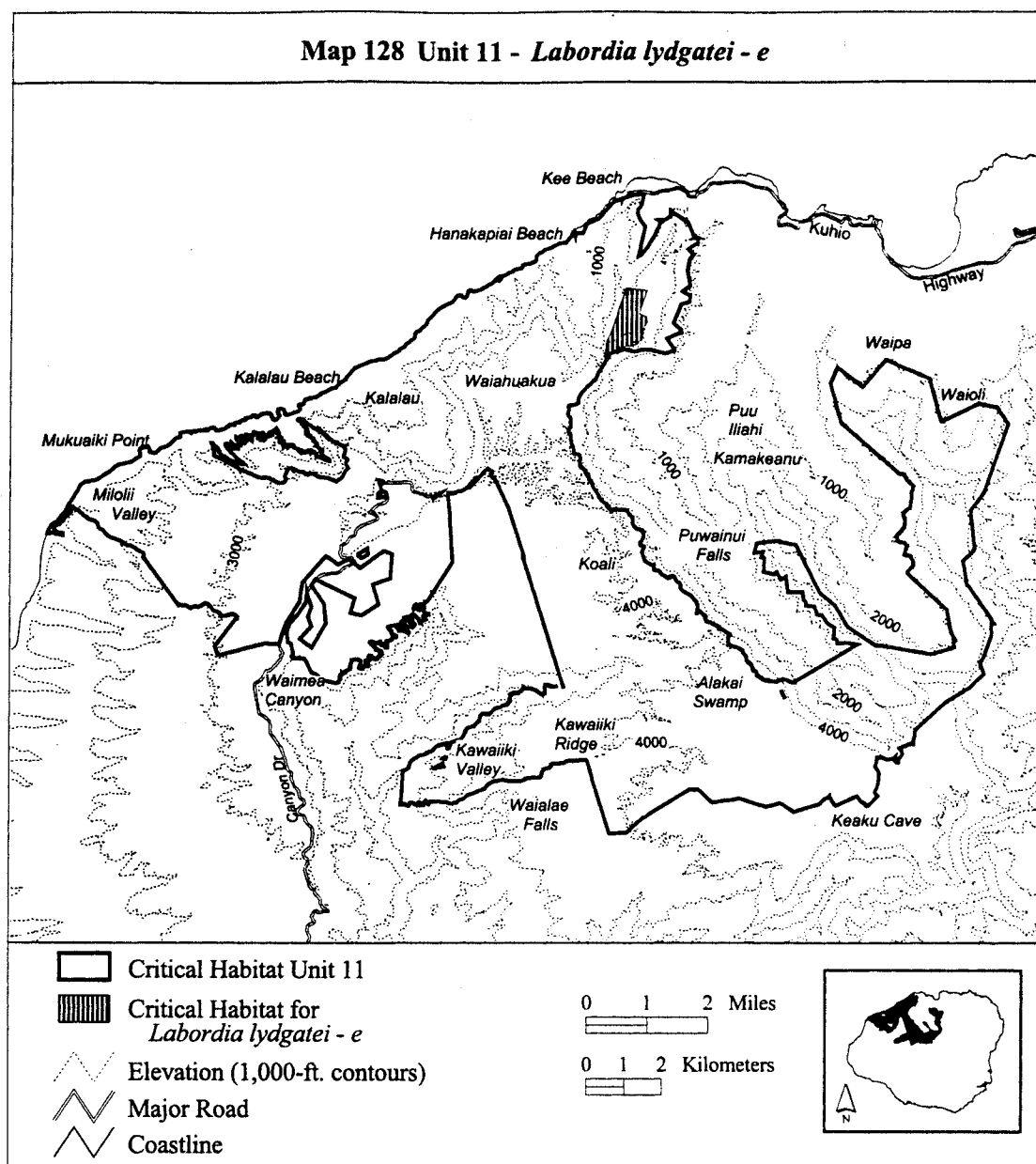
(cxxviii) Kauai 11—*Labordia lydgatei*—e (117 ha; 290 ac)

(A) Unit consists of the following 54 boundary points: Start at 439373, 2452840; 439379, 2452900; 439425, 2453389; 439571, 2453718; 439601, 2453807; 439697, 2454089; 439714, 2454139; 439933, 2454779; 439960, 2454816; 440497, 2454749; 440294, 2454127; 440499, 2454060; 440485, 2453995; 440492, 2453950; 440484,

2453922; 440461, 2453865; 440450, 2453851; 440432, 2453815; 440421, 2453780; 440412, 2453745; 440410, 2453716; 440404, 2453694; 440384, 2453655; 440378, 2453623; 440380, 2453590; 440370, 2453517; 440363, 2453496; 440355, 2453461; 440350, 2453451; 440333, 2453428; 440315, 2453408; 440288, 2453388; 440275, 2453381; 440244, 2453334; 440223, 2453322; 440199, 2453305; 440147,

2453289; 440119, 2453282; 440093, 2453280; 439987, 2453284; 439962, 2453283; 439924, 2453275; 439905, 2453264; 439787, 2453162; 439724, 2453135; 439639, 2453119; 439600, 2453107; 439553, 2453082; 439503, 2453046; 439481, 2453022; 439473, 2452985; 439464, 2452963; 439414, 2452909; 439390, 2452876; return to starting point.

(B) **Note:** Map 128 follows:



(cxxxix) Kauai 11—*Lipochaeta fauriei*—a (106 ha; 262 ac)

(A) Unit consists of the following 221 boundary points: Start at 438277, 2444393; 438400, 2444405; 438465, 2444470; 438698, 2444457; 438880, 2444314; 439087, 2444392; 438906, 2444224; 438607, 2444328; 438374, 2444120; 438296, 2444042; 438205, 2444094; 438153, 2444042; 438063, 2444107; 437959, 2444094; 437738, 2443939; 437492, 2444004; 437492, 2443874; 437271, 2443926; 437206, 2443731; 437245, 2443576; 437168, 2443472; 437129, 2443355; 436973, 2443368; 436869, 2443472; 436545, 2443368; 436428, 2443265; 436532, 2443070; 436454, 2442966; 436363, 2442940; 436221, 2442927; 436182,

2442914; 435948, 2442863; 435883, 2442979; 435812, 2443191; 435821, 2443194; 435842, 2443199; 435861, 2443202; 435874, 2443204; 435889, 2443208; 435904, 2443211; 435933, 2443223; 435942, 2443232; 435949, 2443246; 435958, 2443255; 435969, 2443263; 435979, 2443271; 435993, 2443281; 436010, 2443297; 436032, 2443316; 436048, 2443332; 436064, 2443343; 436080, 2443358; 436089, 2443375; 436095, 2443390; 436100, 2443403; 436107, 2443421; 436113, 2443456; 436118, 2443477; 436123, 2443502; 436134, 2443520; 436146, 2443534; 436160, 2443543; 436175, 2443554; 436190, 2443560; 436213, 2443563; 436227, 2443563; 436240, 2443562; 436254, 2443557; 436265,

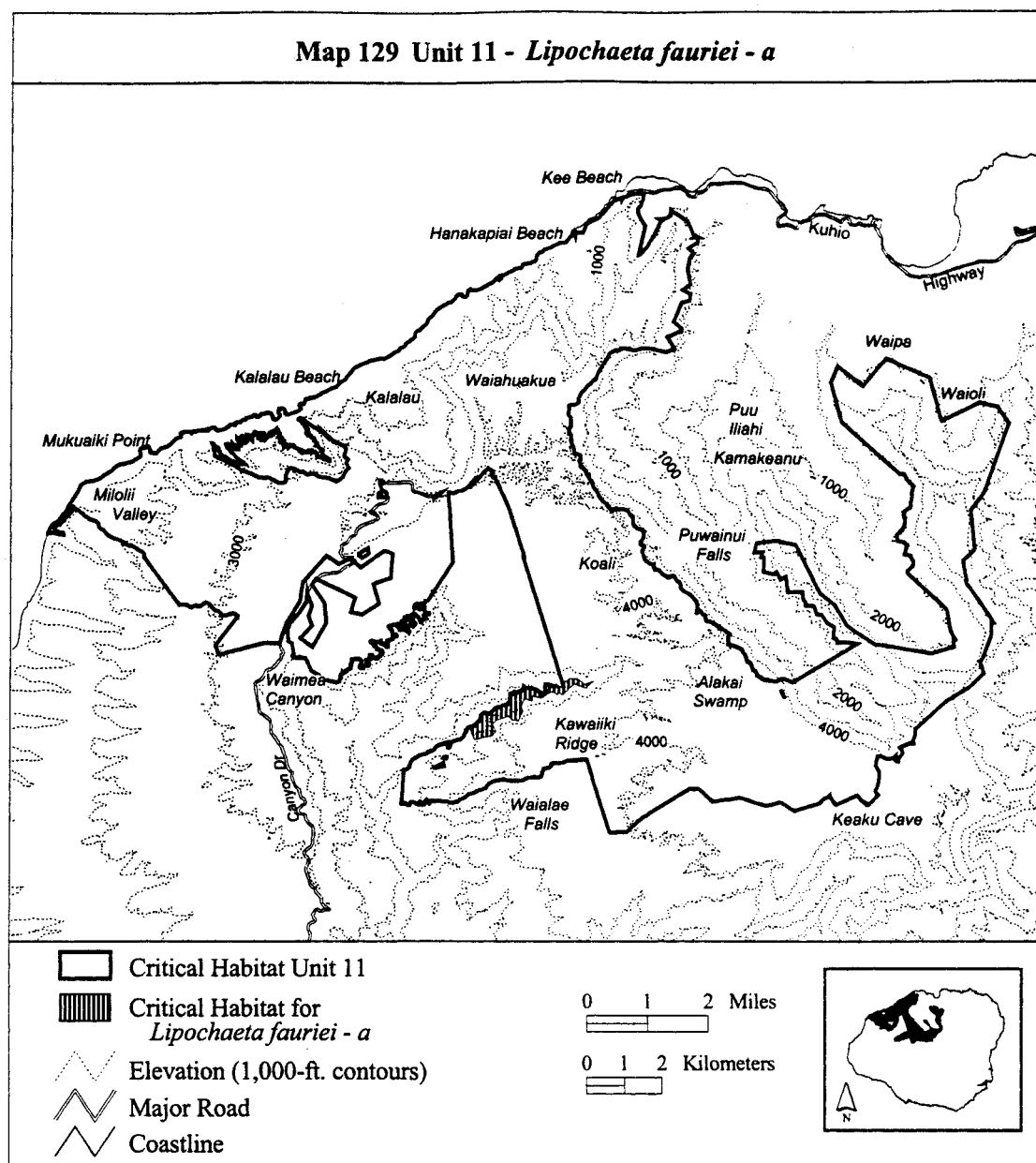
2443552; 436274, 2443547; 436287, 2443540; 436300, 2443537; 436315, 2443532; 436328, 2443529; 436337, 2443528; 436348, 2443531; 436357, 2443536; 436369, 2443546; 436380, 2443558; 436392, 2443572; 436403, 2443585; 436421, 2443611; 436438, 2443631; 436460, 2443655; 436478, 2443676; 436497, 2443688; 436518, 2443696; 436534, 2443700; 436558, 2443707; 436576, 2443711; 436597, 2443714; 436611, 2443716; 436630, 2443718; 436644, 2443720; 436655, 2443724; 436666, 2443731; 436678, 2443742; 436697, 2443756; 436708, 2443763; 436726, 2443769; 436745, 2443772; 436758, 2443775; 436771, 2443776; 436788, 2443776; 436799, 2443778; 436808, 2443781; 436818,

2443785; 436823, 2443786; 436829,
2443790; 436837, 2443797; 436841,
2443801; 436845, 2443807; 436852,
2443819; 436861, 2443831; 436870,
2443847; 436882, 2443863; 436890,
2443877; 436900, 2443900; 436911,
2443923; 436914, 2443936; 436914,
2443948; 436914, 2443952; 436916,
2443955; 436913, 2443964; 436910,
2443981; 436908, 2443995; 436908,
2444013; 436911, 2444027; 436918,
2444040; 436926, 2444047; 436933,
2444055; 436942, 2444065; 436951,
2444073; 436961, 2444084; 436969,
2444094; 436975, 2444098; 436983,
2444102; 436994, 2444107; 437009,
2444108; 437026, 2444105; 437049,
2444100; 437067, 2444092; 437076,
2444089; 437106, 2444090; 437119,
2444096; 437128, 2444104; 437133,

2444112; 437137, 2444122; 437144,
2444130; 437156, 2444135; 437169,
2444141; 437183, 2444150; 437191,
2444154; 437202, 2444165; 437212,
2444177; 437228, 2444198; 437239,
2444213; 437245, 2444227; 437254,
2444239; 437263, 2444246; 437278,
2444240; 437294, 2444234; 437310,
2444225; 437332, 2444217; 437351,
2444217; 437370, 2444223; 437391,
2444223; 437412, 2444226; 437428,
2444226; 437445, 2444223; 437462,
2444219; 437482, 2444211; 437497,
2444205; 437541, 2444190; 437563,
2444183; 437578, 2444179; 437593,
2444170; 437610, 2444160; 437624,
2444146; 437636, 2444132; 437651,
2444119; 437671, 2444112; 437691,
2444102; 437703, 2444093; 437722,
2444082; 437732, 2444069; 437749,

2444061; 437758, 2444058; 437768,
2444060; 437780, 2444066; 437810,
2444080; 437821, 2444088; 437831,
2444100; 437833, 2444111; 437835,
2444126; 437833, 2444139; 437827,
2444163; 437822, 2444185; 437820,
2444206; 437818, 2444236; 437824,
2444265; 437828, 2444292; 437836,
2444314; 437843, 2444322; 437854,
2444327; 437871, 2444328; 437887,
2444323; 437909, 2444314; 437933,
2444302; 437960, 2444289; 437984,
2444274; 438007, 2444260; 438028,
2444258; 438048, 2444258; 438072,
2444260; 438087, 2444266; 438109,
2444271; 438133, 2444273; 438164,
2444270; 438196, 2444263; 438335,
2444214; return to starting point.

(B) **Note:** Map 129 follows:



(cxxx) Kauai 11—*Lipochaeta fauriei*—b
(545 ha; 1,347 ac)

(A) Unit consists of the following 125 boundary points: Start at 427560, 2448644; 427186, 2448690; 426974, 2448883; 427525, 2448944; 427595, 2449029; 427167, 2449118; 426897, 2449284; 426885, 2449330; 426974, 2449445; 427105, 2449399; 427240, 2449511; 427082, 2449526; 426943, 2449646; 427440, 2449757; 427583, 2449646; 427618, 2449680; 427398, 2449919; 427865, 2449846; 428011, 2449885; 428188, 2449777; 428304, 2449623; 428428, 2449542; 428420, 2449472; 428694, 2449411; 428790, 2449353; 428825, 2449426; 428917, 2449457; 429041, 2449399; 429145, 2449376; 429160, 2449464; 429287,

2449491; 429446, 2449526; 429623, 2449565; 429696, 2449549; 429769, 2449595; 429912, 2449630; 430487, 2449303; 430645, 2449087; 430564, 2449079; 430271, 2449172; 430271, 2449087; 430359, 2448921; 430174, 2448944; 430082, 2449056; 429816, 2449094; 429870, 2448987; 429781, 2448929; 429816, 2448813; 430016, 2448736; 429893, 2448636; 429939, 2448528; 429789, 2448524; 429634, 2448671; 429604, 2448543; 429650, 2448482; 429496, 2448297; 429634, 2448176; 429739, 2448229; 429966, 2448239; 430066, 2448292; 430130, 2448260; 430145, 2448155; 430019, 2448139; 429813, 2448076; 429761, 2447976; 430019, 2447912; 429913, 2447865; 429676, 2447849; 429565,

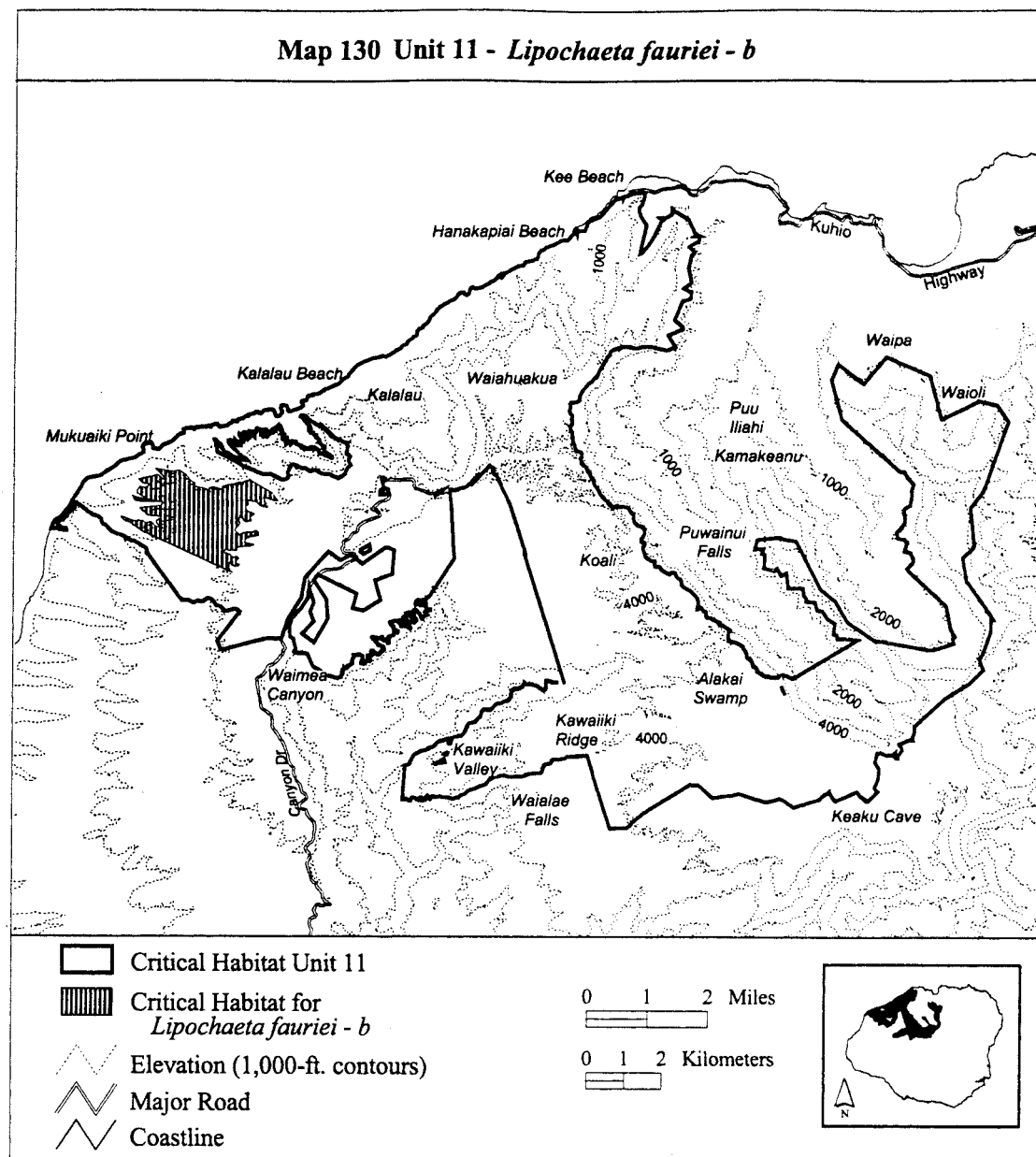
2447833; 429560, 2447786; 429555, 2447760; 429397, 2447754; 429323, 2447754; 429281, 2447807; 429223, 2447749; 429244, 2447681; 429307, 2447686; 429397, 2447639; 429418, 2447591; 429497, 2447581; 429544, 2447612; 429623, 2447549; 429555, 2447517; 429550, 2447459; 429550, 2447407; 429634, 2447375; 429587, 2447349; 429539, 2447328; 429486, 2447338; 429423, 2447380; 429386, 2447438; 429349, 2447422; 429355, 2447338; 429349, 2447307; 429381, 2447238; 429415, 2447204; 429378, 2447191; 427051, 2448261; 426945, 2448329; 426845, 2448398; 426782, 2448408; 426734, 2448482; 426608, 2448535; 426534, 2448566; 426465, 2448640; 426518, 2448645; 426603,

2448608; 426766, 2448550; 426866,
2448524; 426908, 2448556; 427040,
2448556; 427124, 2448471; 427277,
2448524; 427330, 2448445; 427356,

2448398; 427393, 2448376; 427441,
2448376; 427483, 2448366; 427552,
2448329; 427573, 2448329; 427536,
2448387; 427462, 2448424; 427425,

2448466; 427409, 2448508; 427409,
2448540; return to starting point.

(B) Note: Map 130 follows:



(cxxx) Kauai 11—*Lipochaeta micrantha*—b (212 ha; 523 ac)

(A) Unit consists of the following 161 boundary points: Start at 437819, 2444222; 437929, 2444255; 437929, 2444124; 437901, 2444021; 437814, 2443944; 437514, 2443802; 437432, 2443802; 437241, 2443671; 437055, 2443306; 437028, 2441843; 436689, 2441952; 436285, 2441925; 436029, 2442618; 435914, 2442984; 435859, 2443120; 435831, 2443197; 435842, 2443199; 435861, 2443202; 435874,

2443204; 435889, 2443208; 435904, 2443211; 435933, 2443223; 435942, 2443232; 435949, 2443246; 435958, 2443255; 435969, 2443263; 435979, 2443271; 435993, 2443281; 436010, 2443297; 436032, 2443316; 436048, 2443332; 436064, 2443343; 436080, 2443358; 436089, 2443375; 436095, 2443390; 436100, 2443403; 436107, 2443421; 436113, 2443456; 436118, 2443477; 436123, 2443502; 436134, 2443520; 436146, 2443534; 436160, 2443543; 436175, 2443554; 436190,

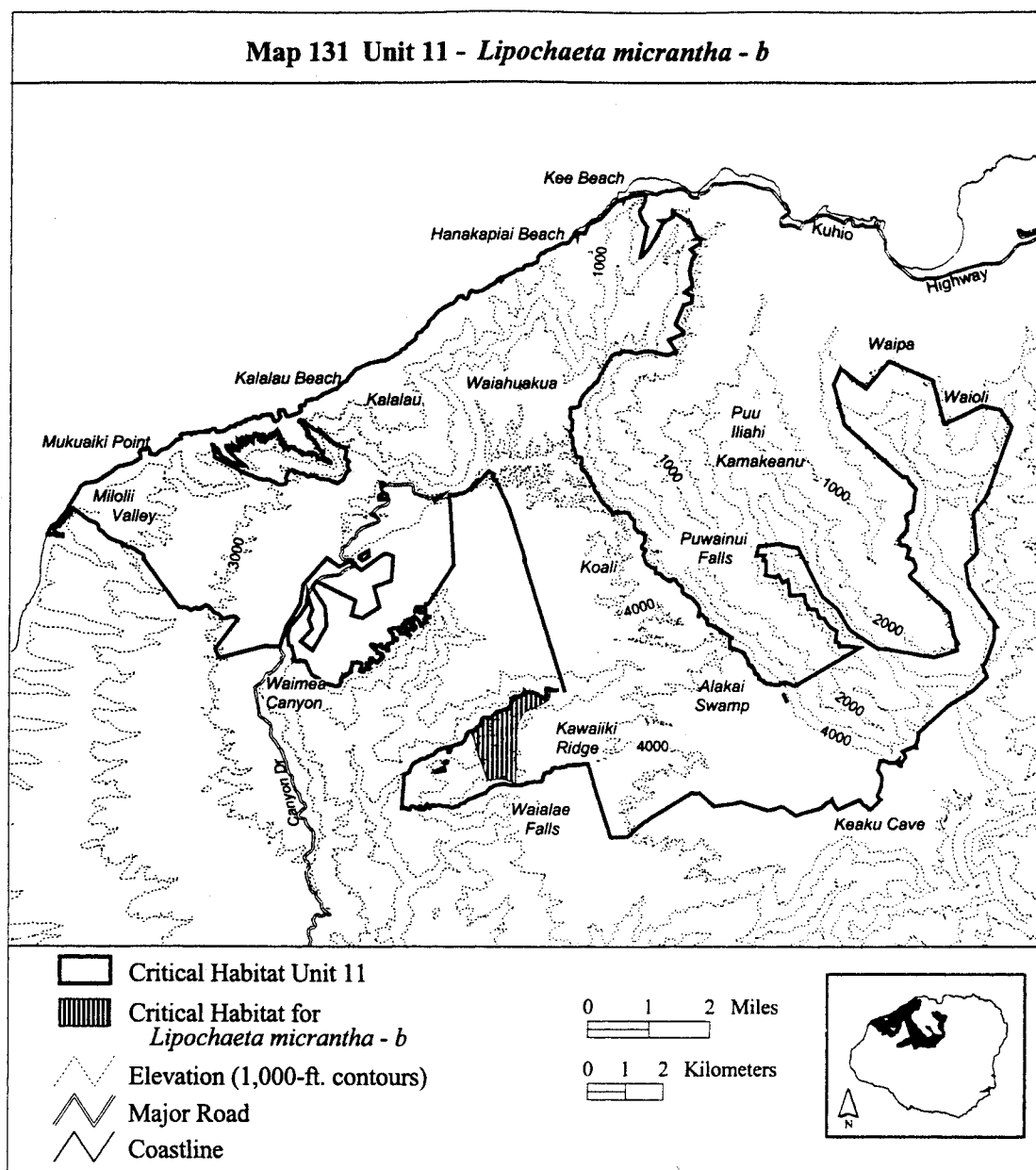
2443560; 436213, 2443563; 436227, 2443563; 436240, 2443562; 436254, 2443557; 436265, 2443552; 436274, 2443547; 436287, 2443540; 436300, 2443537; 436315, 2443532; 436328, 2443529; 436337, 2443528; 436348, 2443531; 436357, 2443536; 436369, 2443546; 436380, 2443558; 436392, 2443572; 436403, 2443585; 436421, 2443611; 436438, 2443631; 436460, 2443655; 436478, 2443676; 436497, 2443688; 436518, 2443696; 436534, 2443700; 436558, 2443707; 436576,

2443711; 436597, 2443714; 436611,
2443716; 436630, 2443718; 436644,
2443720; 436655, 2443724; 436666,
2443731; 436678, 2443742; 436697,
2443756; 436708, 2443763; 436726,
2443769; 436745, 2443772; 436758,
2443775; 436771, 2443776; 436788,
2443776; 436799, 2443778; 436808,
2443781; 436818, 2443785; 436823,
2443786; 436829, 2443790; 436837,
2443797; 436841, 2443801; 436845,
2443807; 436852, 2443819; 436861,
2443831; 436870, 2443847; 436882,
2443863; 436890, 2443877; 436900,
2443900; 436909, 2443918; 436968,
2443955; 437037, 2444102; 437049,

2444100; 437067, 2444092; 437076,
2444089; 437106, 2444090; 437119,
2444096; 437128, 2444104; 437133,
2444112; 437137, 2444122; 437144,
2444130; 437156, 2444135; 437169,
2444141; 437183, 2444150; 437191,
2444154; 437202, 2444165; 437212,
2444177; 437228, 2444198; 437239,
2444213; 437245, 2444227; 437254,
2444239; 437263, 2444246; 437278,
2444240; 437294, 2444234; 437310,
2444225; 437332, 2444217; 437351,
2444217; 437370, 2444223; 437391,
2444223; 437412, 2444226; 437428,
2444226; 437445, 2444223; 437462,
2444219; 437482, 2444211; 437497,

2444205; 437541, 2444190; 437563,
2444183; 437578, 2444179; 437593,
2444170; 437610, 2444160; 437624,
2444146; 437636, 2444132; 437651,
2444119; 437671, 2444112; 437691,
2444102; 437703, 2444093; 437722,
2444082; 437732, 2444069; 437749,
2444061; 437758, 2444058; 437768,
2444060; 437780, 2444066; 437810,
2444080; 437821, 2444088; 437831,
2444100; 437833, 2444111; 437835,
2444126; 437833, 2444139; 437827,
2444163; 437822, 2444185; 437820,
2444206; return to starting point.

(B) Note: Map 131 follows:



(cxxxii) Kauai 11—*Lobelia
niihauensis*—a (89 ha; 220 ac)

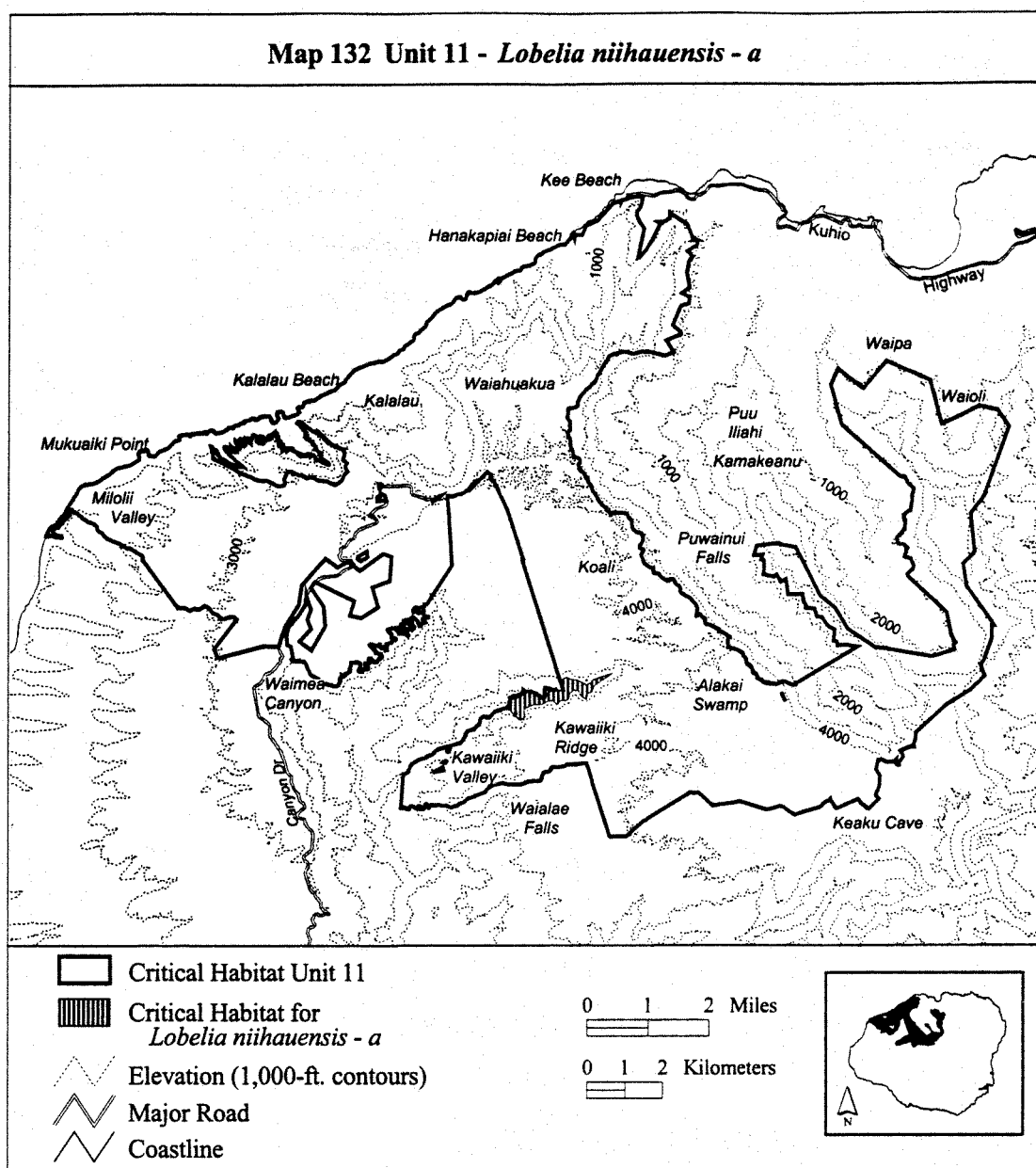
(A) Unit consists of the following 143
boundary points: Start at 438259,

2444449; 438306, 2444552; 438419,
2444604; 438532, 2444542; 438686,
2444532; 438810, 2444470; 438933,
2444398; 439036, 2444449; 439108,
2444521; 439344, 2444614; 439611,
2444696; 439313, 2444501; 439149,
2444388; 439077, 2444223; 438974,
2444162; 438943, 2444018; 438769,
2444131; 438707, 2444254; 438584,
2444254; 438481, 2444152; 438460,
2444028; 438378, 2443977; 438255,
2443977; 438152, 2443864; 438059,
2443987; 437905, 2443957; 437782,
2443885; 437535, 2443874; 437361,
2443813; 437268, 2443741; 437299,
2443546; 437179, 2443460; 436834,
2443794; 436837, 2443797; 436841,
2443801; 436845, 2443807; 436852,
2443819; 436861, 2443831; 436870,
2443847; 436882, 2443863; 436890,
2443877; 436900, 2443900; 436911,

2443923; 436914, 2443936; 436914,
2443948; 436913, 2443962; 436910,
2443981; 436908, 2443995; 436908,
2444013; 436911, 2444027; 436918,
2444040; 436926, 2444047; 436933,
2444055; 436942, 2444065; 436951,
2444073; 436961, 2444084; 436969,
2444094; 436975, 2444098; 436983,
2444102; 436994, 2444107; 437009,
2444108; 437026, 2444105; 437049,
2444100; 437067, 2444092; 437076,
2444089; 437106, 2444090; 437119,
2444096; 437128, 2444104; 437133,
2444112; 437137, 2444122; 437144,
2444130; 437156, 2444135; 437169,
2444141; 437183, 2444150; 437191,
2444154; 437202, 2444165; 437212,
2444177; 437228, 2444198; 437239,
2444213; 437245, 2444227; 437254,
2444239; 437263, 2444246; 437278,
2444240; 437294, 2444234; 437310,
2444225; 437332, 2444217; 437351,
2444217; 437370, 2444223; 437391,
2444223; 437412, 2444226; 437428,
2444226; 437445, 2444223; 437462,
2444219; 437482, 2444211; 437497,

2444205; 437541, 2444190; 437563,
2444183; 437578, 2444179; 437593,
2444170; 437610, 2444160; 437624,
2444146; 437636, 2444132; 437651,
2444119; 437671, 2444112; 437691,
2444102; 437703, 2444093; 437722,
2444082; 437732, 2444069; 437749,
2444061; 437758, 2444058; 437768,
2444060; 437780, 2444066; 437810,
2444080; 437821, 2444088; 437831,
2444100; 437833, 2444111; 437835,
2444126; 437833, 2444139; 437827,
2444163; 437822, 2444185; 437820,
2444206; 437818, 2444236; 437824,
2444265; 437828, 2444292; 437836,
2444314; 437843, 2444322; 437854,
2444327; 437871, 2444328; 437887,
2444323; 437909, 2444314; 437933,
2444302; 437960, 2444289; 437984,
2444274; 438007, 2444260; 438028,
2444258; 438048, 2444258; 438072,
2444260; 438087, 2444266; 438109,
2444271; 438133, 2444273; 438164,
2444270; 438196, 2444263; 438335,
2444214; return to starting point.

(B) **Note:** Map 132 follows:



(cxxxiii) Kauai 11—*Lobelia niihauensis*—b (2,001 ha; 4,945 ac)

(A) Unit consists of the following 117 boundary points: Start at 432783, 2450812; 432645, 2451038; 432384, 2452020; 432426, 2452045; 432733, 2452216; 433075, 2452284; 433587, 2452284; 433211, 2452557; 433337, 2452799; 433777, 2452923; 433907, 2453037; 433997, 2453103; 434388, 2453374; 434591, 2453578; 434851, 2454007; 434988, 2454058; 435043, 2454198; 435247, 2454164; 435227, 2454251; 435315, 2454323; 435507, 2454503; 435959, 2454232; 435835, 2454695; 436208, 2454763; 436490, 2454954; 436731, 2454808; 436705, 2455135; 437089, 2455293; 437180,

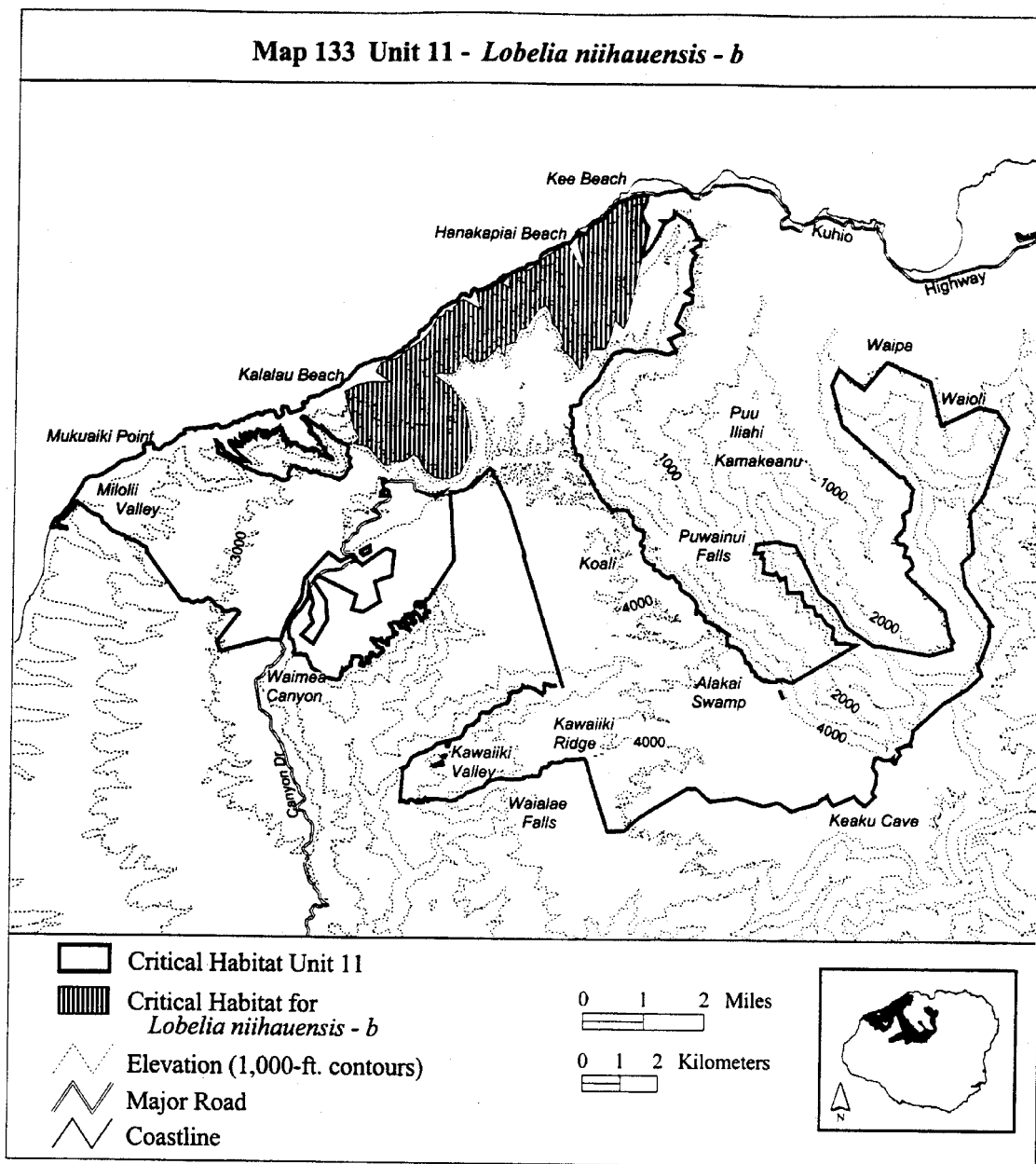
2455248; 437507, 2455462; 437653, 2455627; 438253, 2455970; 438308, 2455956; 438616, 2455368; 438704, 2455385; 438649, 2455642; 438547, 2456015; 438604, 2456274; 438785, 2456263; 438898, 2456511; 439191, 2456650; 439587, 2457085; 439610, 2457109; 439815, 2457168; 439822, 2457153; 439835, 2457174; 439931, 2457201; 439939, 2457196; 439951, 2457207; 440098, 2457249; 440099, 2457249; 440144, 2457261; 440144, 2457262; 440197, 2457277; 440250, 2457274; 440289, 2457294; 440298, 2457298; 440390, 2457272; 440371, 2457184; 440366, 2457125; 440313, 2456964; 440227, 2456872; 440225, 2456766; 440259, 2456708; 440304, 2456601; 440437, 2456434; 439892,

2453948; 439806, 2453749; 439595, 2453953; 439565, 2453982; 439486, 2453621; 439327, 2453203; 439067, 2453192; 438952, 2453169; 438672, 2452605; 438425, 2452972; 438107, 2453238; 438208, 2453351; 438166, 2453511; 438016, 2453768; 437892, 2453870; 437851, 2454115; 437722, 2454364; 437530, 2454243; 437406, 2454051; 437236, 2453746; 437038, 2453682; 436908, 2453374; 436671, 2453283; 436628, 2452965; 436479, 2453283; 436174, 2452934; 436013, 2452829; 435877, 2452897; 435808, 2452795; 435552, 2453013; 435360, 2452572; 435224, 2452516; 435055, 2452516; 434958, 2452552; 434761, 2452505; 435236, 2452144; 435569, 2451669; 435740, 2451054; 435774,

2450474; 435501, 2449893; 435193,
2449723; 434817, 2449757; 434510,
2449996; 434373, 2450269; 434241,

2450382; 433992, 2450213; 433632,
2450160; 433584, 2450069; 433449,

2450088; 433020, 2450563; 432625,
2450654; return to starting point.
(B) Note: Map 133 follows:



(cxxxiv) Kauai 11—*Mariscus pennatiformis*—a (1,003 ha; 2,479 ac)

(A) Unit consists of the following 166 boundary points: Start at 427069, 2447857; 427386, 2447885; 427526, 2447931; 427834, 2447978; 427862, 2448071; 428021, 2448192; 427974, 2448332; 427853, 2448416; 427937, 2448603; 427862, 2448724; 428021, 2448910; 428207, 2449050; 427853, 2449237; 427778, 2449386; 428095, 2449358; 428179, 2449442; 428300, 2449311; 428534, 2449218; 428860, 2449237; 429131, 2449246; 429532,

2449432; 429765, 2449516; 429970, 2449563; 430036, 2449609; 429812, 2449908; 430269, 2449740; 430316, 2449740; 430365, 2449716; 430348, 2449666; 430355, 2449641; 430354, 2449622; 430346, 2449596; 430331, 2449565; 430320, 2449553; 430313, 2449532; 430312, 2449517; 430307, 2449482; 430318, 2449477; 430335, 2449474; 430349, 2449466; 430355, 2449451; 430369, 2449433; 430418, 2449395; 430437, 2449371; 430430, 2449364; 430451, 2449363; 430463, 2449355; 430474, 2449342; 430485,

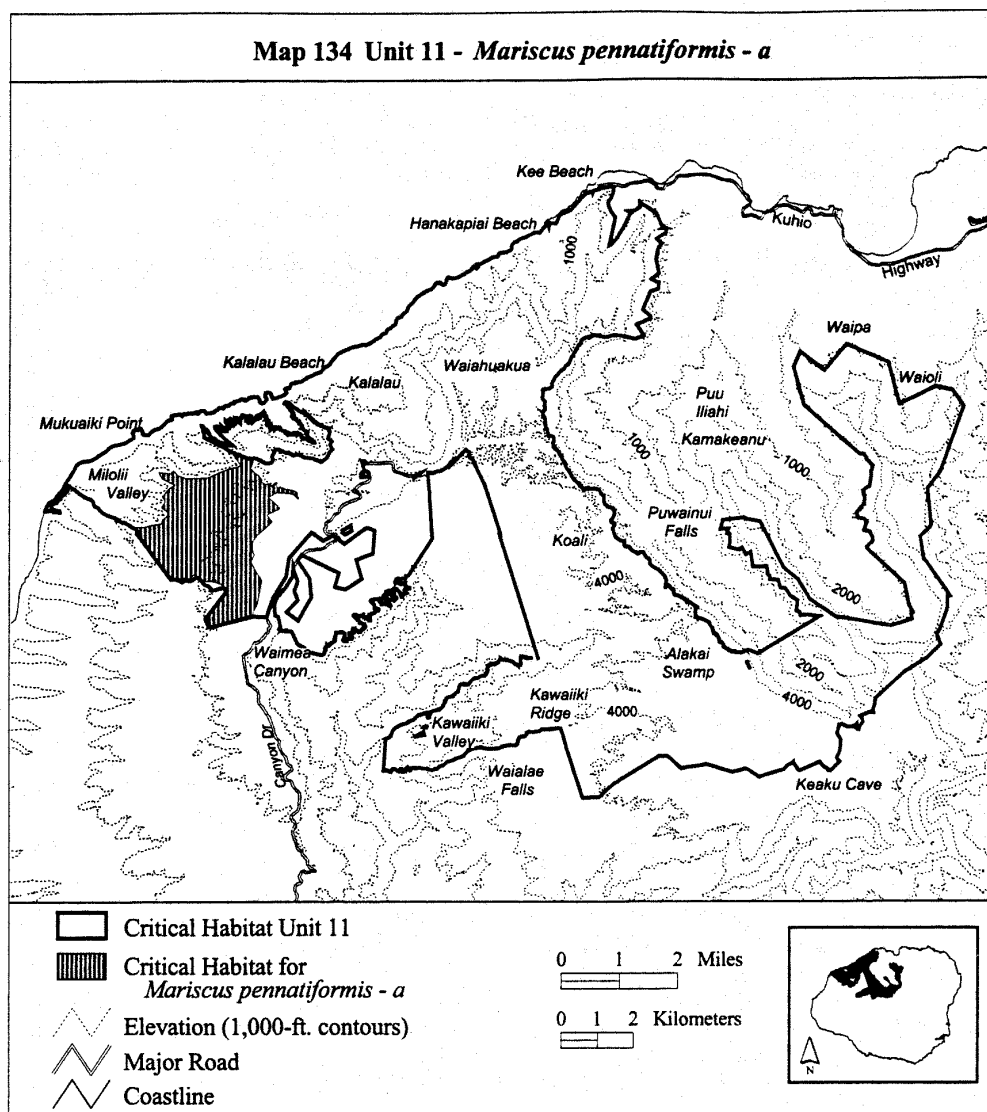
2449333; 430527, 2449321; 430533, 2449310; 430545, 2449277; 430559, 2449254; 430604, 2449229; 430616, 2449214; 430623, 2449194; 430623, 2449173; 430616, 2449156; 430619, 2449138; 430629, 2449119; 430643, 2449106; 430677, 2449084; 430699, 2449074; 430717, 2449071; 430748, 2449070; 430773, 2449073; 430799, 2449081; 430825, 2449080; 430875, 2449032; 430881, 2449027; 430905, 2449022; 430921, 2449029; 430944, 2449045; 430958, 2449061; 430967, 2449077; 430984, 2449094; 431006,

2449097; 431020, 2449089; 431028,
2449064; 431024, 2449005; 431035,
2448975; 431050, 2448960; 431066,
2448956; 431086, 2448957; 431093,
2448962; 431116, 2448991; 431124,
2448994; 431134, 2448988; 431138,
2448981; 431147, 2448955; 431158,
2448950; 431170, 2448954; 431195,
2448966; 431208, 2448969; 431223,
2448964; 431228, 2448960; 431275,
2448914; 431290, 2448911; 431310,
2448912; 431339, 2448927; 431358,
2448923; 431376, 2448914; 431407,
2448903; 431463, 2448902; 431473,
2448899; 431479, 2448891; 431501,
2448872; 431538, 2448867; 431545,

2448867; 431567, 2448859; 431580,
2448844; 431596, 2448824; 431611,
2448789; 431609, 2448764; 431601,
2448750; 431600, 2448733; 431627,
2448682; 431633, 2448663; 431482,
2448789; 431043, 2448845; 430810,
2448705; 431043, 2448490; 431118,
2448378; 430764, 2448220; 430903,
2448015; 430680, 2447800; 430512,
2447661; 430362, 2447493; 430353,
2447260; 430418, 2447101; 430325,
2446914; 430456, 2446653; 430624,
2446420; 430540, 2446010; 430484,
2445730; 430381, 2445543; 430396,
2445420; 429224, 2445116; 429062,
2445354; 429654, 2446125; 429591,

2446167; 429485, 2446305; 429263,
2446389; 429094, 2446389; 428972,
2446421; 428904, 2446474; 428793,
2446542; 428740, 2446564; 428655,
2446474; 428602, 2446447; 428476,
2446463; 428396, 2446447; 428285,
2446458; 428116, 2446474; 428047,
2446484; 427185, 2447661; 427161,
2447669; 427157, 2447676; 427157,
2447711; 427175, 2447754; 427176,
2447775; 427171, 2447800; 427160,
2447815; 427124, 2447837; 427084,
2447847; 427070, 2447853; return to
starting point.

(B) Note: Map 134 follows:



(cxxxv) Kauai 11—*Melicope*
haupuensis—b (574 ha; 1,418 ac)

(A) Unit consists of the following 198
boundary points: Start at 431912,
2448420; 431913, 2448409; 431890,

2448340; 431898, 2448263; 431898,
2448254; 431900, 2448247; 431922,
2448193; 431934, 2448181; 431929,
2448176; 431931, 2448173; 431918,
2448148; 431909, 2448152; 431904,
2448146; 431867, 2448164; 431806,

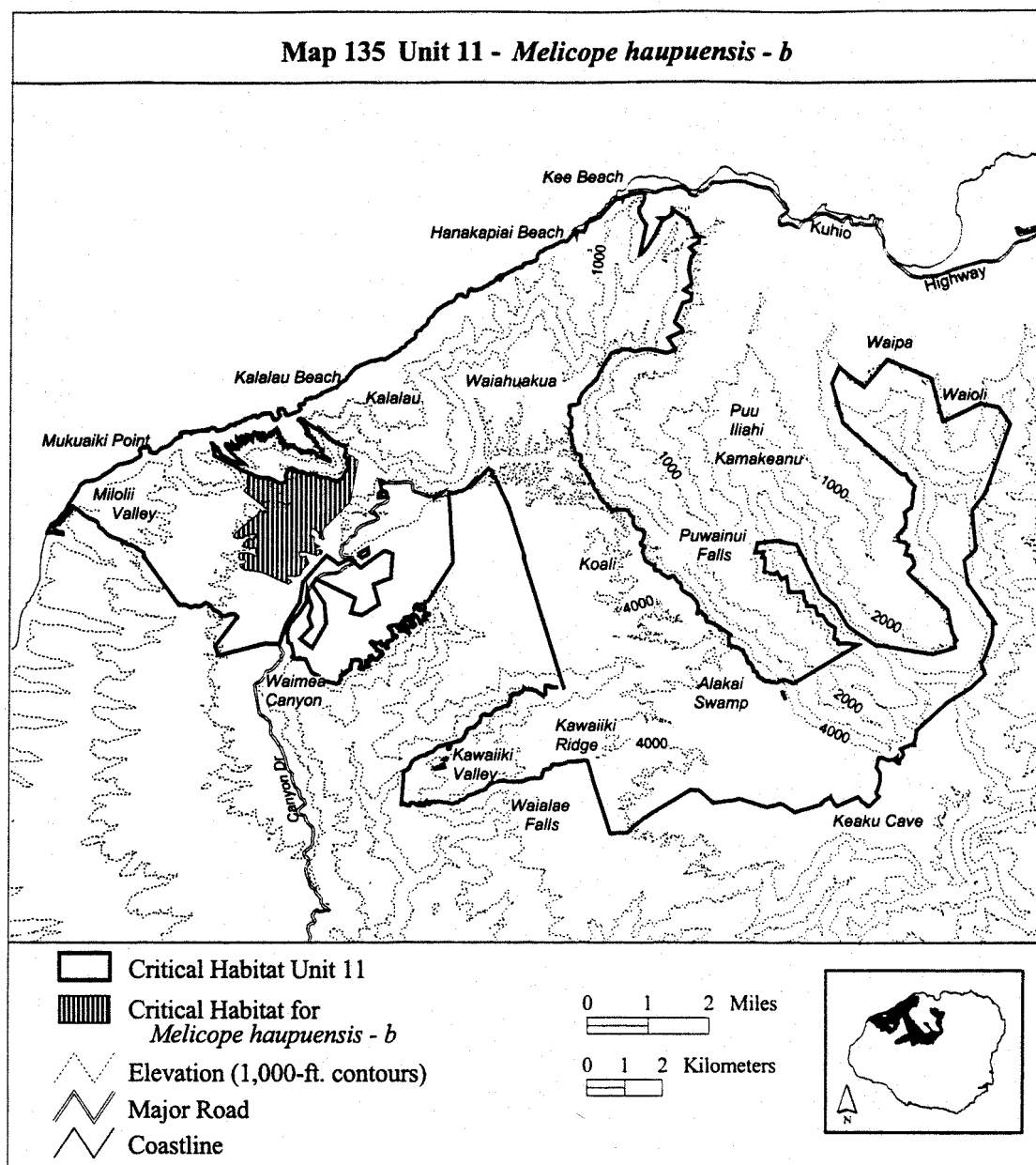
2448187; 431806, 2448233; 431806,
2448249; 431788, 2448341; 431653,
2448421; 431645, 2448424; 431625,
2448424; 431570, 2448341; 431570,
2448273; 431668, 2448210; 431668,
2448205; 431682, 2448198; 431669,

2448173; 431667, 2448147; 431676,
2448133; 431662, 2448106; 431657,
2448061; 431812, 2447974; 431789,
2447963; 431806, 2447957; 431745,
2447927; 431713, 2447927; 431682,
2447912; 431713, 2447862; 431862,
2447874; 431900, 2447812; 431862,
2447756; 431800, 2447769; 431750,
2447725; 431607, 2447769; 431427,
2447825; 431371, 2447818; 431271,
2447819; 431284, 2447719; 431408,
2447694; 431452, 2447725; 431526,
2447520; 431396, 2447383; 431340,
2447315; 431327, 2447259; 431290,
2447215; 431197, 2447172; 430948,
2447197; 430948, 2447135; 431060,
2447066; 431085, 2447029; 431035,
2447023; 431016, 2446985; 430736,
2447091; 430493, 2447209; 430388,
2447253; 430325, 2447290; 430027,
2447346; 429877, 2447340; 429722,
2447421; 429697, 2447495; 429821,
2447520; 429859, 2447576; 429834,
2447620; 429772, 2447626; 429728,
2447607; 429678, 2447645; 429660,
2447676; 429691, 2447725; 429672,
2447775; 429716, 2447806; 429741,
2447788; 429797, 2447806; 429965,
2447794; 430039, 2447769; 430126,
2447725; 430176, 2447719; 430176,

2447750; 430120, 2447788; 430120,
2447931; 430008, 2447931; 429865,
2447956; 429803, 2447962; 429790,
2448012; 429853, 2448080; 429896,
2448155; 429958, 2448179; 430052,
2448148; 430139, 2448211; 430139,
2448298; 430033, 2448304; 429865,
2448242; 429778, 2448186; 429548,
2448204; 429548, 2448279; 429653,
2448385; 429716, 2448422; 429772,
2448497; 429877, 2448559; 430014,
2448702; 430108, 2448758; 430151,
2448795; 430195, 2448888; 430257,
2448913; 430338, 2448876; 430400,
2448882; 430425, 2448913; 430420,
2448957; 429806, 2449454; 429896,
2449552; 429879, 2449729; 429905,
2449923; 429915, 2449923; 429944,
2449910; 429968, 2449904; 430016,
2449884; 430068, 2449856; 430172,
2449815; 430207, 2449804; 430261,
2449795; 430317, 2449781; 430340,
2449778; 430365, 2449787; 430392,
2449798; 430408, 2449802; 430410,
2449802; 430406, 2449796; 430471,
2449787; 430527, 2449754; 430583,
2449736; 430635, 2449693; 430696,
2449656; 430720, 2449646; 430819,
2449646; 430899, 2449674; 430918,
2449717; 430904, 2449834; 430927,

2449905; 430955, 2449985; 430993,
2450032; 431068, 2450041; 431153,
2450008; 431238, 2449970; 431285,
2449942; 431360, 2449956; 431449,
2449886; 431497, 2449867; 431605,
2449895; 431657, 2449890; 431699,
2449876; 431765, 2449810; 431864,
2449801; 431981, 2449792; 432047,
2449787; 432113, 2449740; 432217,
2449712; 432259, 2449679; 432344,
2449744; 432419, 2449806; 432471,
2449904; 432504, 2449961; 432579,
2450036; 432551, 2450083; 432523,
2450130; 432523, 2450182; 432565,
2450262; 432523, 2450304; 432475,
2450313; 432452, 2450337; 432461,
2450375; 432480, 2450426; 432490,
2450478; 432501, 2450529; 432504,
2450523; 432515, 2450503; 432528,
2450468; 432550, 2450412; 432573,
2450385; 432591, 2450373; 432650,
2450343; 432692, 2450330; 432709,
2450317; 432733, 2450275; 432745,
2450272; 432752, 2450270; 432768,
2450266; 432797, 2450260; 432826,
2450224; 432630, 2449144; return to
starting point.

(B) **Note:** Map 135 follows:

Map 135 Unit 11 - *Melicope haupuensis* - b

(cxxxvi) Kauai 11—*Melicope haupuensis*—c (290 ha; 716 ac)

(A) Unit consists of the following 184 boundary points: Start at 438165,

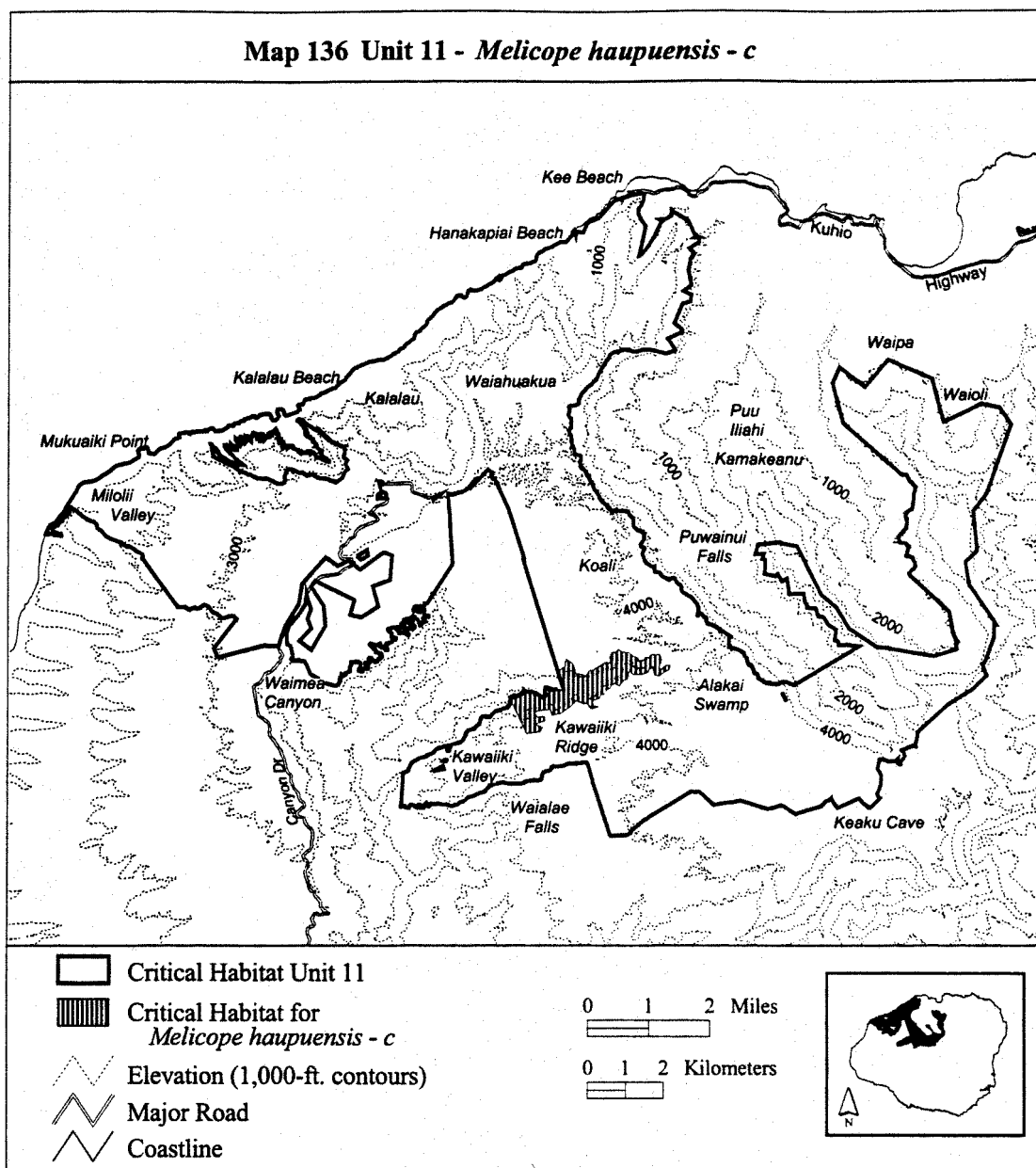
2444743; 438359, 2444869; 438336, 2444973; 438382, 2445065; 438532, 2444973; 438590, 2444869; 438634, 2444680; 438740, 2444673; 438913, 2444615; 438993, 2444767; 439086, 2444765; 439144, 2444811; 439421, 2444984; 439559, 2444972; 439524, 2445099; 439594, 2445249; 439686, 2445238; 439755, 2445318; 439836, 2445261; 439940, 2445249; 440032, 2445238; 440067, 2445203; 440101, 2445203; 440136, 2445145; 440263, 2445099; 440286, 2445007; 440344, 2445030; 440424, 2445041; 440459, 2445111; 440540, 2445099; 440586, 2445099; 440586, 2445157; 440644, 2445203; 440713, 2445180; 440840, 2445191; 440886, 2445099; 440886, 2444984; 440828, 2444891; 440840, 2444765; 440932, 2444834; 441013, 2444903; 441117, 2444903; 441105, 2444799; 440955, 2444707; 440851, 2444638; 440713, 2444649; 440655, 2444857; 440551, 2444788; 440551, 2444718; 440378, 2444661; 440147, 2444661; 440044, 2444788; 440044, 2444730; 439997, 2444696; 440032, 2444615; 439997, 2444534; 439905, 2444511; 439790, 2444361; 439663, 2444430; 439559, 2444361; 439547, 2444292; 439467, 2444280; 439386, 2444131; 439294, 2444142; 439271, 2444038; 439086, 2443981; 439074, 2443935; 439109, 2443831; 439224, 2443831; 439109, 2443762; 439040, 2443762; 438924, 2443912; 438855, 2443877; 438659, 2443969; 438486, 2443808; 438255, 2443635; 438001, 2443600; 437978, 2443727; 437863, 2443727; 437678, 2443716; 437551, 2443670; 437632, 2443531; 437805, 2443543; 437817, 2443450; 437551, 2443358; 437759, 2443266; 437701, 2443150; 437332, 2443104; 436908, 2444000; 436908, 2444013; 436911, 2444027; 436918, 2444040; 436926, 2444047; 436933, 2444055; 436942, 2444065; 436951, 2444073; 436961, 2444084; 436969, 2444094; 436975, 2444098; 436983, 2444102; 436994, 2444107; 437009, 2444108; 437026, 2444105; 437049, 2444100; 437067,

2444092; 437076, 2444089; 437106,
2444090; 437119, 2444096; 437128,
2444104; 437133, 2444112; 437137,
2444122; 437144, 2444130; 437156,
2444135; 437169, 2444141; 437183,
2444150; 437191, 2444154; 437202,
2444165; 437212, 2444177; 437228,
2444198; 437239, 2444213; 437245,
2444227; 437254, 2444239; 437263,
2444246; 437278, 2444240; 437294,
2444234; 437310, 2444225; 437332,
2444217; 437351, 2444217; 437370,
2444223; 437391, 2444223; 437412,
2444226; 437428, 2444226; 437445,

2444223; 437462, 2444219; 437482,
2444211; 437497, 2444205; 437541,
2444190; 437563, 2444183; 437578,
2444179; 437593, 2444170; 437610,
2444160; 437624, 2444146; 437636,
2444132; 437651, 2444119; 437671,
2444112; 437691, 2444102; 437703,
2444093; 437722, 2444082; 437732,
2444069; 437749, 2444061; 437758,
2444058; 437768, 2444060; 437780,
2444066; 437810, 2444080; 437821,
2444088; 437831, 2444100; 437833,
2444111; 437835, 2444126; 437833,
2444139; 437827, 2444163; 437822,

2444185; 437820, 2444206; 437818,
2444236; 437824, 2444265; 437828,
2444292; 437836, 2444314; 437843,
2444322; 437854, 2444327; 437871,
2444328; 437887, 2444323; 437909,
2444314; 437933, 2444302; 437960,
2444289; 437984, 2444274; 438007,
2444260; 438028, 2444258; 438048,
2444258; 438072, 2444260; 438087,
2444266; 438109, 2444271; 438133,
2444273; 438164, 2444270; 438196,
2444263; 438335, 2444214; return to
starting point.

(B) Note: Map 136 follows:



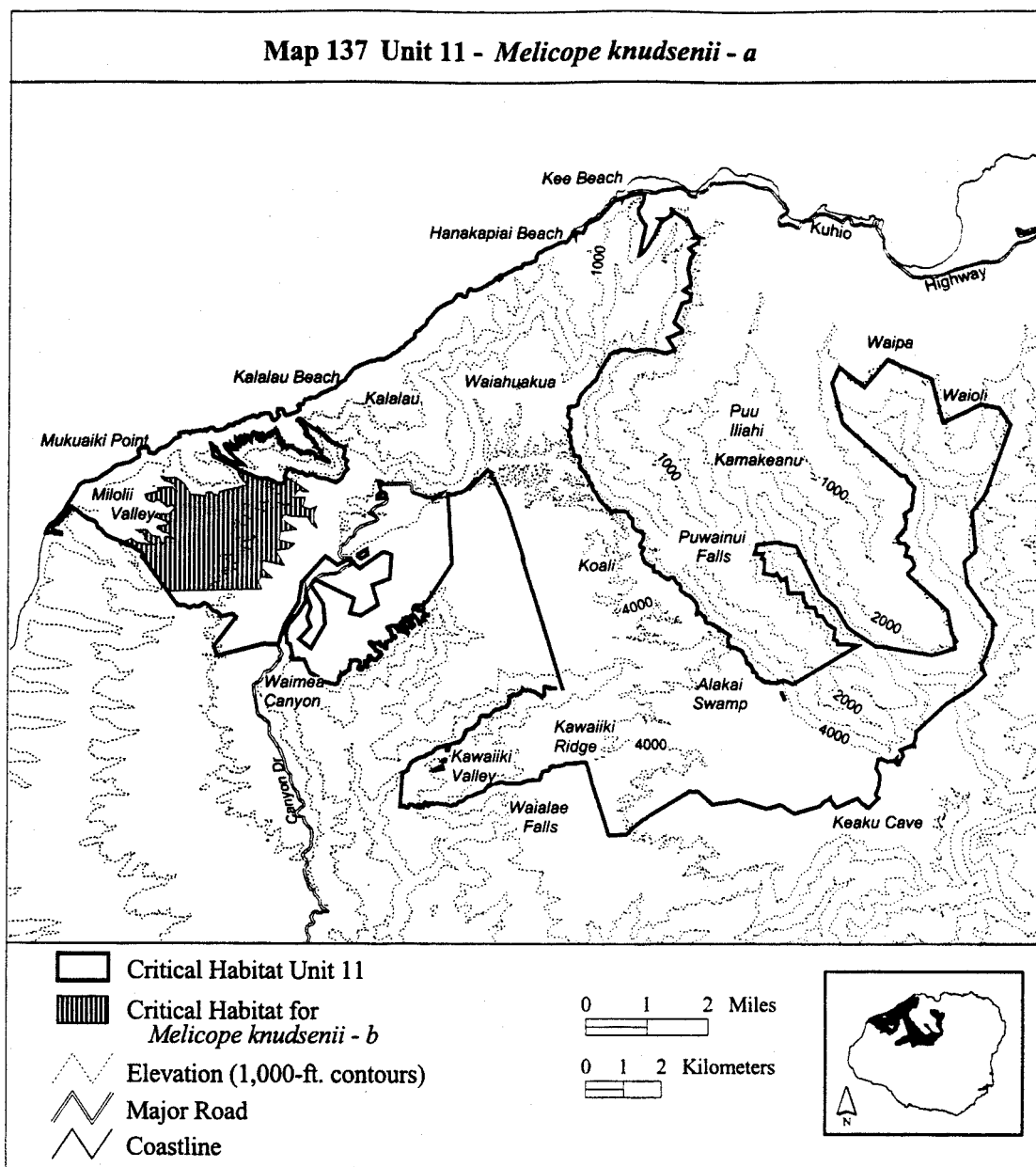
(cxxxvii) Kauai 11—*Melicope knudsenii*—a (966 ha; 2,388 ac)

(A) Unit consists of the following 146 boundary points: Start at 431708, 2448615; 431773, 2448514; 431767, 2448519; 431773, 2448510; 431773, 2448476; 431619, 2448589; 431507, 2448763; 431066, 2448773; 430954, 2448845; 430861, 2448773; 430913, 2448650; 431230, 2448425; 430810, 2448364; 430759, 2448149; 431199, 2448046; 431036, 2447923; 430687, 2447883; 430923, 2447483; 430339, 2447606; 430319, 2447401; 430605, 2447145; 430308, 2447176; 430237, 2447043; 430329, 2446859; 427820, 2446794; 427748, 2446893; 427778, 2446910; 427739, 2446905; 427185, 2447661; 427161, 2447669; 427157, 2447676; 427157, 2447711; 427175, 2447754; 427176, 2447775; 427171, 2447800; 427160, 2447815; 427124, 2447837; 427084, 2447847; 427039, 2447867; 426997, 2447892; 426981, 2447902; 426958, 2447923; 426944, 2447941; 426907, 2447965; 426847,

2447992; 426819, 2447998; 426798, 2448010; 426758, 2448005; 426737, 2448009; 426722, 2448015; 426635, 2448077; 426856, 2448180; 427000, 2448088; 427461, 2448016; 427235, 2448159; 427184, 2448333; 427000, 2448395; 427287, 2448415; 427389, 2448282; 427604, 2448221; 427686, 2448036; 427778, 2448067; 427737, 2448159; 427788, 2448241; 427963, 2448180; 427829, 2448333; 427707, 2448354; 427543, 2448487; 427881, 2448569; 427748, 2448661; 427512, 2448743; 427287, 2448774; 427287, 2448815; 427870, 2448845; 428045, 2449030; 427942, 2449081; 427809, 2449019; 427604, 2449193; 427502, 2449193; 427471, 2449152; 427276, 2449183; 427215, 2449347; 427635, 2449459; 427553, 2449521; 427932, 2449552; 428065, 2449429; 427993, 2449644; 427727, 2449726; 427635, 2449838; 427819, 2449787; 428014, 2449818; 428270, 2449644; 428424, 2449357; 428823, 2449316; 428833, 2449398; 428966, 2449439; 429038, 2449357; 429171, 2449326; 429182,

2449429; 429940, 2449613; 429735, 2449817; 429642, 2450043; 429648, 2450043; 429717, 2449996; 429751, 2449978; 429791, 2449963; 429830, 2449956; 429860, 2449947; 429944, 2449910; 429968, 2449904; 430016, 2449884; 430068, 2449856; 430172, 2449815; 430207, 2449804; 430261, 2449795; 430317, 2449781; 430340, 2449778; 430365, 2449787; 430392, 2449798; 430408, 2449802; 430410, 2449802; 430406, 2449796; 430471, 2449787; 430527, 2449754; 430583, 2449736; 430635, 2449693; 430696, 2449656; 430720, 2449646; 430819, 2449646; 430899, 2449674; 430918, 2449717; 430904, 2449834; 430913, 2449863; 431548, 2449428; 431415, 2449428; 431292, 2449490; 431138, 2449285; 431445, 2449275; 431384, 2449039; 431589, 2448957; 431763, 2449039; 431681, 2448855; 431681, 2448656; 431678, 2448658; 431680, 2448656; 431681, 2448656; return to starting point.

(B) **Note:** Map 137 follows:



(cxxxviii) Kauai 11—*Melicope knudsenii*—b (374 ha; 922 ac)

(A) Unit consists of the following 305 boundary points: Start at 435336,

2442801; 435344, 2442802; 435367, 2442807; 435391, 2442814; 435415, 2442819; 435435, 2442826; 435454, 2442831; 435476, 2442838; 435496, 2442844; 435516, 2442850; 435530, 2442853; 435534, 2442855; 435543, 2442858; 435556, 2442862; 435571, 2442867; 435585, 2442876; 435598, 2442885; 435608, 2442891; 435619, 2442899; 435627, 2442904; 435642, 2442920; 435658, 2442932; 435668, 2442948; 435673, 2442959; 435681, 2442977; 435688, 2442995; 435693, 2443006; 435698, 2443024; 435704,

2443036; 435708, 2443047; 435715, 2443064; 435722, 2443078; 435725, 2443086; 435729, 2443093; 435735, 2443103; 435738, 2443112; 435743, 2443127; 435749, 2443138; 435753, 2443149; 435757, 2443155; 435766, 2443169; 435778, 2443179; 435790, 2443186; 435804, 2443188; 435821, 2443194; 435842, 2443199; 435861, 2443202; 435874, 2443204; 435889, 2443208; 435904, 2443211; 435933, 2443223; 435942, 2443232; 435949, 2443246; 435958, 2443255; 435969, 2443263; 435979, 2443271; 435993, 2443281; 436010, 2443297; 436032, 2443316; 436048, 2443332; 436064, 2443343; 436080, 2443358; 436089, 2443375; 436095, 2443390; 436100,

2443403; 436107, 2443421; 436113, 2443456; 436118, 2443477; 436123, 2443502; 436134, 2443520; 436146, 2443534; 436160, 2443543; 436175, 2443554; 436190, 2443560; 436213, 2443563; 436227, 2443563; 436240, 2443562; 436254, 2443557; 436265, 2443552; 436274, 2443547; 436287, 2443540; 436300, 2443537; 436315, 2443532; 436328, 2443529; 436337, 2443528; 436348, 2443531; 436357, 2443536; 436369, 2443546; 436380, 2443558; 436392, 2443572; 436403, 2443585; 436421, 2443611; 436438, 2443631; 436460, 2443655; 436478, 2443676; 436497, 2443688; 436518, 2443696; 436534, 2443700; 436558, 2443707; 436576, 2443711; 436597,

2443714; 436611, 2443716; 436630, 2443718; 436644, 2443720; 436655, 2443724; 436666, 2443731; 436678, 2443742; 436697, 2443756; 436708, 2443763; 436726, 2443769; 436745, 2443772; 436758, 2443775; 436771, 2443776; 436788, 2443776; 436799, 2443778; 436808, 2443781; 436818, 2443785; 436823, 2443786; 436829, 2443790; 436837, 2443797; 436841, 2443801; 436845, 2443807; 436852, 2443819; 436861, 2443831; 436870, 2443847; 436882, 2443863; 436890, 2443877; 436900, 2443900; 436911, 2443923; 436914, 2443936; 436914, 2443948; 436913, 2443962; 436910, 2443981; 436908, 2443994; 436945, 2444067; 436951, 2444073; 436961, 2444084; 436969, 2444094; 436975, 2444098; 436983, 2444102; 436994, 2444107; 437009, 2444108; 437026, 2444105; 437049, 2444100; 437067, 2444092; 437076, 2444089; 437106, 2444090; 437118, 2444096; 437169, 2444079; 437282, 2444210; 437602, 2444165; 437610, 2444160; 437624, 2444146; 437636, 2444132; 437651, 2444119; 437671, 2444112; 437691, 2444102; 437703, 2444093; 437722, 2444082; 437732, 2444069; 437749, 2444061; 437758, 2444058; 437768, 2444060; 437780, 2444066; 437810, 2444080; 437821, 2444088; 437831, 2444100; 437833, 2444111; 437835, 2444126; 437833, 2444139; 437827, 2444163; 437822, 2444185; 437820, 2444206; 437818, 2444236; 437824, 2444265; 437828, 2444292; 437836,

2444314; 437843, 2444322; 437854, 2444327; 437871, 2444328; 437887, 2444323; 437909, 2444314; 437933, 2444302; 437960, 2444289; 437984, 2444274; 438007, 2444260; 438028, 2444258; 438048, 2444258; 438072, 2444260; 438087, 2444266; 438109, 2444271; 438133, 2444273; 438164, 2444270; 438196, 2444263; 438335, 2444214; 438237, 2444518; 438277, 2444604; 438343, 2444567; 438362, 2444642; 438465, 2444708; 438550, 2444576; 438803, 2444586; 438897, 2444426; 439001, 2444463; 439038, 2444614; 439282, 2444689; 439733, 2444745; 439696, 2444914; 439789, 2444951; 439818, 2444801; 439799, 2444707; 439423, 2444538; 439433, 2444482; 439226, 2444407; 439273, 2444294; 439104, 2444248; 439066, 2444135; 439019, 2444210; 439010, 2444003; 438878, 2443975; 438832, 2444088; 438747, 2444060; 438719, 2444201; 438597, 2444201; 438493, 2444097; 438503, 2444013; 438362, 2443929; 438277, 2443947; 438174, 2443797; 438080, 2443797; 438052, 2443929; 437695, 2443844; 437348, 2443788; 437319, 2443656; 437357, 2443572; 437263, 2443516; 437188, 2443328; 436916, 2443356; 436549, 2443281; 436634, 2442999; 436277, 2442859; 436221, 2442755; 436709, 2442793; 436991, 2442586; 436944, 2442549; 436690, 2442502; 437019, 2442304; 436981, 2442154; 437188, 2442088; 436981, 2442032; 436981, 2441966; 436812, 2441995; 436746,

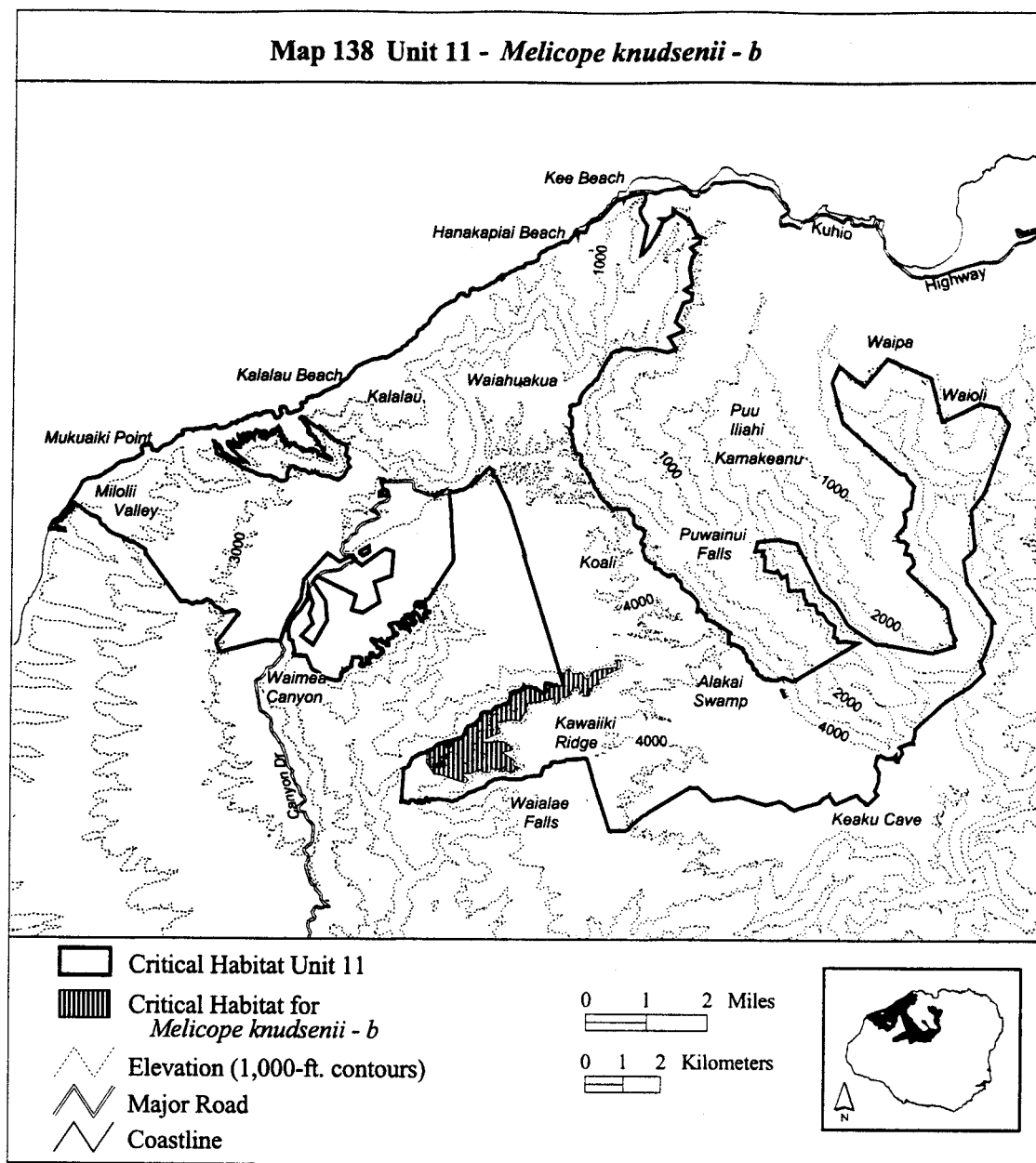
2442117; 436681, 2441995; 436624, 2442051; 436390, 2442070; 436380, 2441957; 436211, 2441957; 436098, 2442042; 435864, 2441929; 435619, 2441938; 435798, 2441769; 435723, 2441685; 435178, 2441863; 435122, 2441882; 434877, 2441920; 434784, 2442061; 434661, 2442239; 434702, 2442503; 434713, 2442515; 434725, 2442524; 434735, 2442532; 434755, 2442542; 434775, 2442551; 434800, 2442556; 434822, 2442562; 434842, 2442574; 434862, 2442596; 434883, 2442613; 434896, 2442626; 434916, 2442647; 434934, 2442668; 434949, 2442681; 434972, 2442699; 434986, 2442705; 434997, 2442708; 435006, 2442713; 435012, 2442717; 435026, 2442719; 435039, 2442722; 435061, 2442727; 435081, 2442733; 435100, 2442739; 435119, 2442747; 435135, 2442754; 435150, 2442764; 435164, 2442771; 435184, 2442774; 435201, 2442777; 435219, 2442778; 435237, 2442782; 435251, 2442783; 435228, 2442762; 435237, 2442643; 435284, 2442631; return to starting point.

(B) Excluding 2 areas:

(1) Bounded by the following 3 points (1 ha, 3 ac): Start at 435132, 2442248; 435160, 2442164; 434848, 2442098; return to starting point; and

(2) Bounded by the following 4 points (0 ha, 1 ac): Start at 435151, 2442425; 435215, 2442393; 435195, 2442353; 435128, 2442379; return to starting point.

(C) **Note:** Map 138 follows:



(cxxxix) Kauai 11—*Melicope pallida*—a (143 ha, 353 ac)

(A) Unit consists of the following 124 boundary points: Start at 438204, 2444622; 438280, 2444652; 438296, 2444737; 438496, 2444768; 438565, 2444637; 438888, 2444575; 438934, 2444498; 438996, 2444683; 439180, 2444675; 439288, 2444760; 439465, 2444837; 439527, 2444829; 439673, 2444821; 439696, 2445067; 440050, 2445044; 440219, 2444944; 440280, 2444844; 440419, 2444844; 440265, 2444783; 440142, 2444906; 439957, 2444952; 439834, 2444913; 439896, 2444760; 439850, 2444644; 439780, 2444637; 439773, 2444483; 439665, 2444560; 439488, 2444521; 439504, 2444445; 439457, 2444368; 439319,

2444360; 439334, 2444283; 439319, 2444199; 439211, 2444214; 439150, 2444076; 439050, 2444122; 439011, 2443953; 438765, 2444014; 438696, 2444099; 438596, 2444129; 438496, 2443945; 438296, 2443883; 438296, 2443791; 438080, 2443699; 438011, 2443868; 437404, 2443753; 437365, 2443676; 437457, 2443530; 437342, 2443476; 437133, 2444113; 437137, 2444122; 437144, 2444130; 437156, 2444135; 437169, 2444141; 437183, 2444150; 437191, 2444154; 437202, 2444165; 437212, 2444177; 437228, 2444198; 437239, 2444213; 437245, 2444227; 437254, 2444239; 437263, 2444246; 437278, 2444240; 437294, 2444234; 437310, 2444225; 437332, 2444217; 437351, 2444217; 437370,

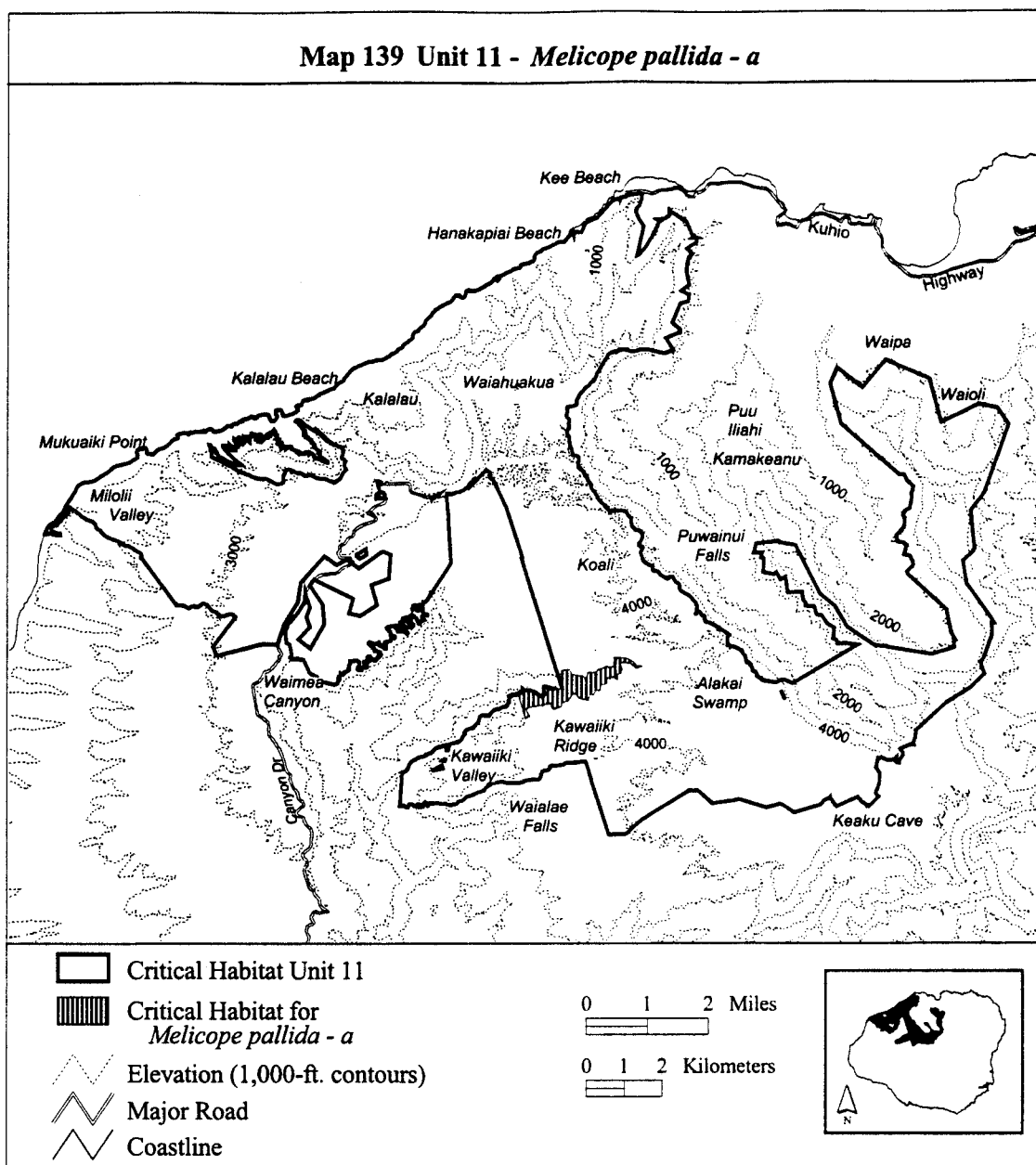
2444223; 437391, 2444223; 437412, 2444226; 437428, 2444226; 437445, 2444223; 437462, 2444219; 437482, 2444211; 437497, 2444205; 437541, 2444190; 437563, 2444183; 437578, 2444179; 437593, 2444170; 437610, 2444160; 437624, 2444146; 437636, 2444132; 437651, 2444119; 437671, 2444112; 437691, 2444102; 437703, 2444093; 437722, 2444082; 437732, 2444069; 437749, 2444061; 437758, 2444058; 437768, 2444060; 437780, 2444066; 437810, 2444080; 437821, 2444088; 437831, 2444100; 437833, 2444111; 437835, 2444126; 437833, 2444139; 437827, 2444163; 437822, 2444185; 437820, 2444206; 437818, 2444236; 437824, 2444265; 437828, 2444292; 437836, 2444314; 437843,

2444322; 437854, 2444327; 437871,
2444328; 437887, 2444323; 437909,
2444314; 437933, 2444302; 437960,
2444289; 437984, 2444274; 438007,

2444260; 438028, 2444258; 438048,
2444258; 438072, 2444260; 438087,
2444266; 438109, 2444271; 438133,
2444273; 438164, 2444270; 438196,

2444263; 438335, 2444214; return to
starting point.

(B) Note: Map 139 follows:



(cxl) Kauai 11—*Melicope pallida*—b
(310 ha; 765 ac)

(A) Unit consists of the following 47
boundary points: Start at 433925,
2450539; 433966, 2450539; 434164,
2450698; 434310, 2450565; 434385,
2450461; 434654, 2450605; 434760,
2450393; 435051, 2450327; 435117,
2450433; 435011, 2450592; 435131,

2450697; 434998, 2450816; 435131,
2451147; 435011, 2451359; 435131,
2451610; 435063, 2451636; 434945,
2451623; 435064, 2451901; 434850,
2452083; 434786, 2452232; 434648,
2452469; 434310, 2452642; 434932,
2452999; 435038, 2452813; 435170,
2452999; 435117, 2453223; 435236,
2453223; 435183, 2453329; 435475,
2453355; 435607, 2452840; 435316,

2452470; 435104, 2452390; 435316,
2452086; 435541, 2451835; 435660,
2451544; 435806, 2451279; 435898,
2450975; 435912, 2450671; 435845,
2450287; 435740, 2449890; 435316,
2449626; 434786, 2449653; 434588,
2449785; 434217, 2450036; 434486,
2450322; 434391, 2450299; 434111,
2450143; return to starting point.

(B) Note: Map 140 follows:

2450903; 431509, 2450895; 431530, 2450888; 431555, 2450880; 431580, 2450878; 431577, 2450867; 431580, 2450848; 431591, 2450839; 431606, 2450830; 431626, 2450824; 431655, 2450815; 431653, 2450800; 431650, 2450792; 431645, 2450777; 431653, 2450764; 431671, 2450767; 431665, 2450749; 431661, 2450738; 431675, 2450731; 431689, 2450726; 431698, 2450722; 431699, 2450717; 431702, 2450701; 431710, 2450693; 431720, 2450686; 431733, 2450677; 431733, 2450656; 431729, 2450645; 431735, 2450642; 431736, 2450636; 431739, 2450626; 431752, 2450619; 431763, 2450615; 431769, 2450597; 431786, 2450573; 431798, 2450561; 431822, 2450550; 431829, 2450545; 431845, 2450528; 431860, 2450521; 431873, 2450519; 431885, 2450510; 431899, 2450498; 431900, 2450492; 431891, 2450486; 431874, 2450483; 431852, 2450481; 431839, 2450475; 431835, 2450472; 431841, 2450451; 431856, 2450433; 431874, 2450409; 431900, 2450378; 431933, 2450350; 431949, 2450336; 431983, 2450316; 432009, 2450298; 432026, 2450277; 432049, 2450261; 432065, 2450255; 432065, 2450248; 432065, 2450233; 432072, 2450223; 432081, 2450211; 432076, 2450207; 432058, 2450218; 432042, 2450225; 432024, 2450234; 432006, 2450246; 431989, 2450255; 431968, 2450265; 431949, 2450270; 431917, 2450271; 431900, 2450287; 431882, 2450301; 431864, 2450315; 431840, 2450325; 431808, 2450327; 431770, 2450328; 431762, 2450341; 431752, 2450353; 431730, 2450369; 431726, 2450392; 431720, 2450403; 431709, 2450416; 431692, 2450418; 431691, 2450429; 431687, 2450439; 431677, 2450453; 431664, 2450465; 431652, 2450468; 431635, 2450468; 431615, 2450468; 431608, 2450462; 431598, 2450460; 431597, 2450472; 431596, 2450476; 431591, 2450488; 431585, 2450499; 431576, 2450494; 431566, 2450502; 431549, 2450505; 431537, 2450505; 431516, 2450496; 431511, 2450486; 431505, 2450470; 431499, 2450454; 431488, 2450449; 431479, 2450454; 431467, 2450462; 431459, 2450467; 431443, 2450470; 431425, 2450469; 431409, 2450466; 431404, 2450459; 431392, 2450462; 431381, 2450464; 431372, 2450459; 431358, 2450458; 431339, 2450460; 431334, 2450462; 431330, 2450466; 431328, 2450478; 431323, 2450490; 431313, 2450497; 431303, 2450494; 431299, 2450488; 431292, 2450476; 431283, 2450480; 431281, 2450486; 431278, 2450497; 431272, 2450502; 431263, 2450505; 431263, 2450516; 431258, 2450530; 431249, 2450545; 431236,

2450549; 431227, 2450551; 431213, 2450554; 431196, 2450558; 431191, 2450563; 431179, 2450576; 431171, 2450582; 431158, 2450585; 431136, 2450584; 431126, 2450573; 431121, 2450586; 431132, 2450596; 431132, 2450623; 431128, 2450641; 431112, 2450648; 431084, 2450652; 431076, 2450639; 431065, 2450624; 431055, 2450628; 431045, 2450645; 431044, 2450656; 431030, 2450661; 431019, 2450646; 431008, 2450631; 430998, 2450615; 430991, 2450601; 430983, 2450597; 430978, 2450604; 430969, 2450622; 430960, 2450622; 430950, 2450609; 430946, 2450604; 430939, 2450609; 430936, 2450617; 430933, 2450631; 430930, 2450644; 430926, 2450657; 430918, 2450664; 430904, 2450664; 430898, 2450659; 430896, 2450648; 430901, 2450638; 430911, 2450630; 430909, 2450620; 430897, 2450617; 430887, 2450619; 430874, 2450620; 430871, 2450614; 430867, 2450602; 430860, 2450586; 430854, 2450591; 430851, 2450600; 430852, 2450614; 430852, 2450631; 430843, 2450645; 430853, 2450656; 430857, 2450667; 430863, 2450680; 430865, 2450697; 430856, 2450711; 430838, 2450715; 430828, 2450715; 430840, 2450723; 430852, 2450728; 430864, 2450742; 430864, 2450756; 430851, 2450759; 430839, 2450752; 430832, 2450747; 430819, 2450748; 430806, 2450738; 430791, 2450737; 430800, 2450754; 430803, 2450759; 430806, 2450776; 430805, 2450791; 430807, 2450800; 430811, 2450812; 430813, 2450819; 430811, 2450834; 430803, 2450837; 430787, 2450832; 430777, 2450824; 430764, 2450815; 430744, 2450805; 430746, 2450813; 430749, 2450824; 430754, 2450841; 430757, 2450850; 430757, 2450862; 430750, 2450872; 430741, 2450873; 430718, 2450870; 430730, 2450885; 430735, 2450896; 430743, 2450916; 430747, 2450940; 430748, 2450959; 430737, 2450969; 430723, 2450972; 430712, 2450965; 430705, 2450955; 430694, 2450953; 430694, 2450967; 430697, 2450980; 430703, 2450995; 430704, 2451010; 430706, 2451037; 430692, 2451040; 430682, 2451033; 430675, 2451043; 430673, 2451050; 430677, 2451062; 430666, 2451065; 430658, 2451067; 430649, 2451073; 430636, 2451076; 430631, 2451072; 430626, 2451059; 430626, 2451041; 430622, 2451022; 430623, 2451005; 430620, 2451000; 430611, 2451001; 430605, 2451008; 430598, 2451020; 430588, 2451025; 430581, 2451020; 430574, 2451012; 430572, 2451002; 430569, 2450983; 430570, 2450961; 430550, 2450974; 430535, 2450983; 430523, 2450988; 430518, 2450991; 430503,

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2456747; return to starting point.

(B) Note: Map 141 follows:

Legend:

- Critical Habitat Unit 11
- Critical Habitat for *Munroidendron racemosum* - c
- Elevation (1,000-ft. contours)
- Major Road
- Coastline

Scale:

- 0 1 2 Miles
- 0 1 2 Kilometers

Map Labels:

- Kee Beach
- Hanakapi'ai Beach
- Kalalau Beach
- Mukuaiki Point
- Milolii Valley
- Waimea Canyon
- Kawaiiki Valley
- Waialeale Falls
- Kawaiiki Ridge
- Alakai Swamp
- Keaku Cave
- Puu Iliahi
- Kamakeanu
- Puwainui Falls
- Koali
- Waipa
- Waioli
- Kuhio
- Highway

Inset Map:

The inset map shows the location of the Koolaha Critical Habitat Unit 11 on the island of Kauai, Hawaii. The unit is located on the western side of the island, near the tip of the peninsula.

(A) Unit consists of the following 285 boundary points: Start at 435336, 2442801; 435344, 2442802; 435367, 2442807; 435391, 2442814; 435415, 2442819; 435435, 2442826; 435454, 2442831; 435476, 2442838; 435496, 2442844; 435516, 2442850; 435530, 2442853; 435534, 2442855; 435543, 2442858; 435556, 2442862; 435571, 2442867; 435585, 2442876; 435598, 2442885; 435608, 2442891; 435619, 2442899; 435627, 2442904; 435642, 2442920; 435658, 2442932; 435668, 2442948; 435673, 2442959; 435681, 2442977; 435688, 2442995; 435693, 2443006; 435698, 2443024; 435704,

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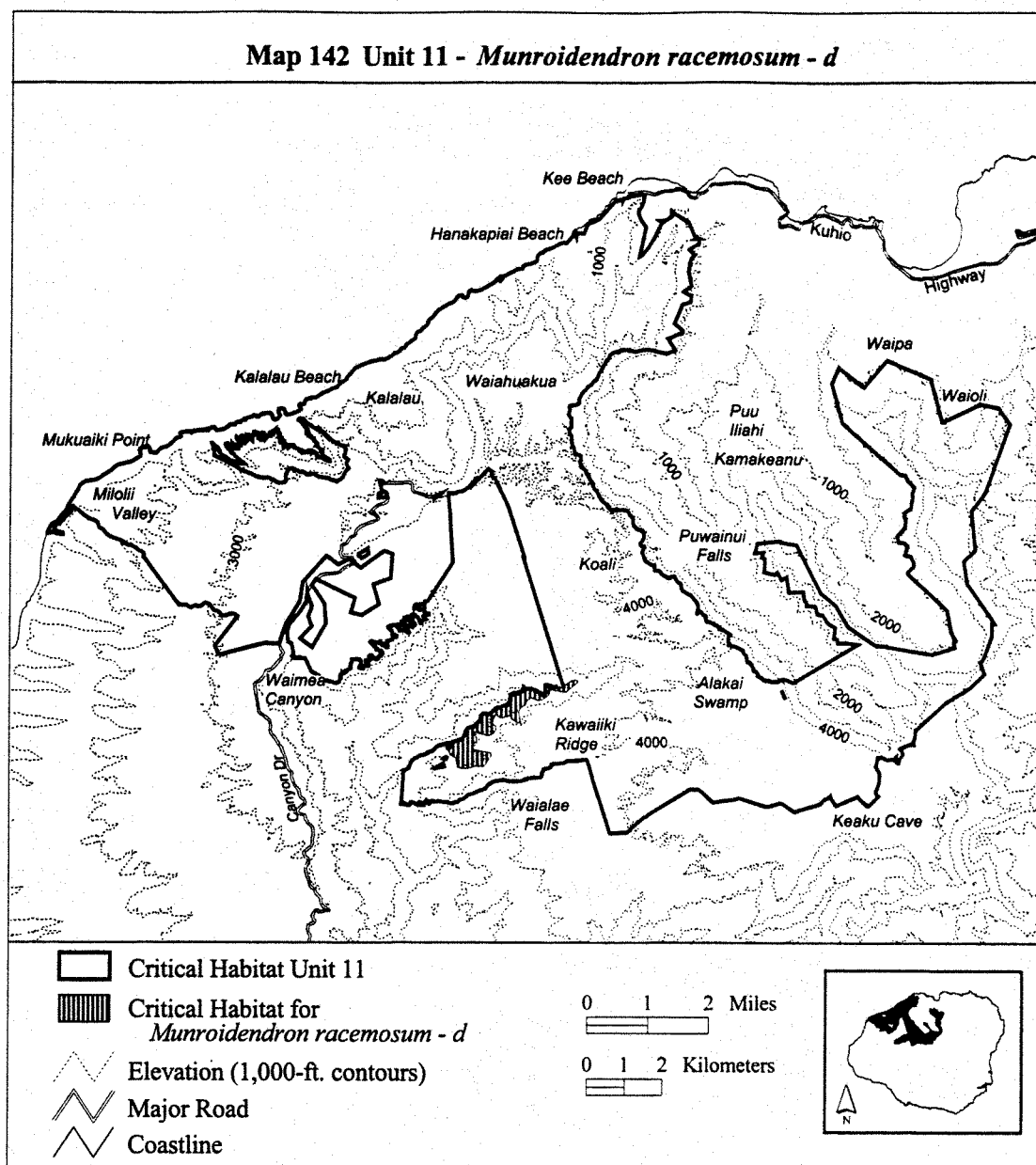
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2442631; return to starting point.

(B) **Note:** Map 142 follows:



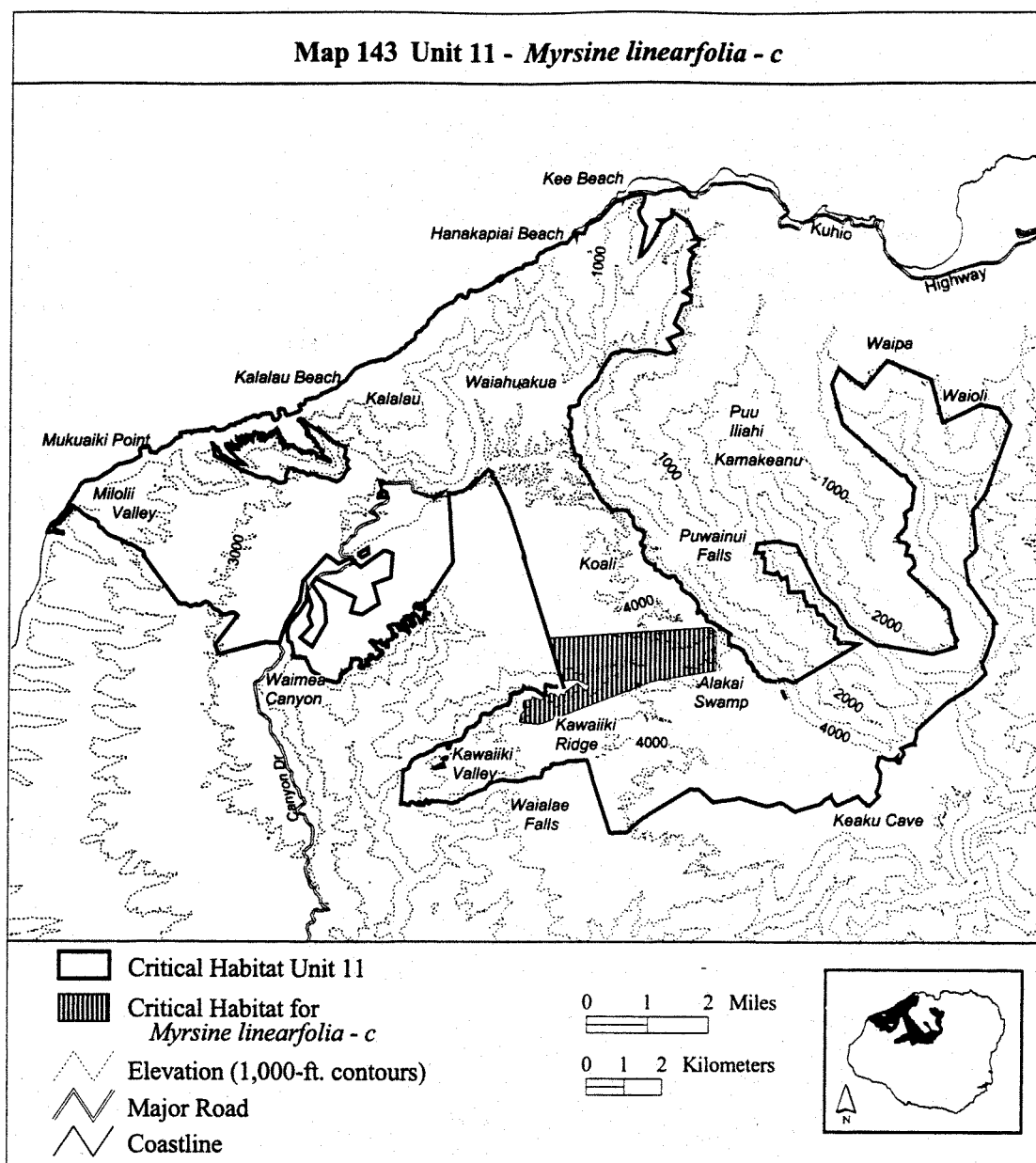
(cxliiii) Kauai 11—*Myrsine linearifolia*—
c (684 ha; 1,691 ac)

(A) Unit consists of the following 28
boundary points: Start at 442333,
2445731; 442333, 2444698; 440696,
2444413; 437673, 2443278; 437145,

2443341; 437172, 2443520; 437271,
2443636; 437235, 2443770; 437262,
2443895; 437467, 2443931; 437476,
2444011; 437718, 2443913; 437915,
2444047; 437977, 2444118; 438031,
2444065; 438076, 2444083; 438174,
2443957; 438237, 2444083; 438353,

2444038; 438362, 2444127; 438675,
2444351; 438907, 2444154; 438997,
2444297; 438675, 2444449; 438344,
2444431; 438272, 2444411; 437909,
2445539; 442203, 2445834; return to
starting point.

(B) **Note:** Map 143 follows:



(cxliv) Kauai 11—*Myrsine linearifolia*—d (286 ha; 707 ac)

(A) Unit consists of the following 63 boundary points: Start at 439347, 2452789; 439324, 2452794; 439098, 2452402; 438924, 2452225; 438478, 2451772; 438422, 2451715; 438396, 2451689; 438313, 2451903; 438586, 2452835; 438813, 2453426; 439200, 2453198; 439382, 2453721; 439337, 2454084; 439541, 2454152; 439654, 2455463; 439655, 2455470; 440286,

2455134; 440577, 2454992; 440294, 2454127; 440499, 2454060; 440485, 2453995; 440492, 2453950; 440484, 2453922; 440461, 2453865; 440450, 2453851; 440432, 2453815; 440421, 2453780; 440412, 2453745; 440410, 2453716; 440404, 2453694; 440384, 2453655; 440378, 2453623; 440380, 2453590; 440370, 2453517; 440363, 2453496; 440355, 2453461; 440350, 2453451; 440333, 2453428; 440315, 2453408; 440288, 2453388; 440275, 2453381; 440244, 2453334; 440223,

2453322; 440199, 2453305; 440147, 2453289; 440119, 2453282; 440093, 2453280; 439987, 2453284; 439962, 2453283; 439924, 2453275; 439905, 2453264; 439787, 2453162; 439724, 2453135; 439639, 2453119; 439600, 2453107; 439553, 2453082; 439503, 2453046; 439481, 2453022; 439473, 2452985; 439464, 2452963; 439414, 2452909; 439390, 2452876; 439355, 2452801; return to starting point.

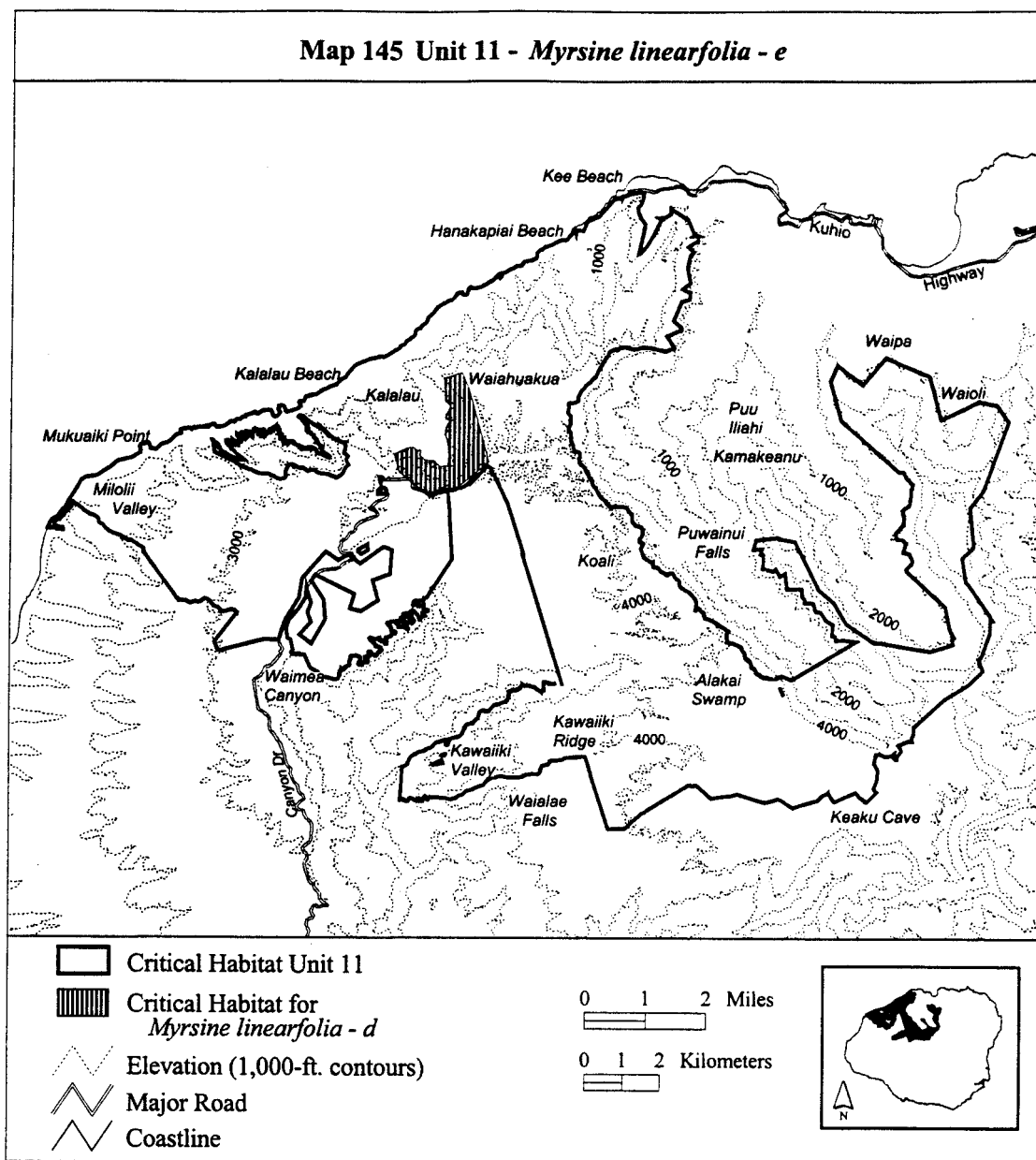
(B) Note: Map 144 follows:

[illegible]

(A) Unit consists of the following 37 boundary points: Start at 435236, 2449351; 435214, 2449343; 434747, 2449168; 434654, 2449245; 433915, 2449865; 433804, 2450325; 434145, 2450488; 434338, 2450503; 434390, 2450429; 434502, 2450436; 434502, 2450273; 434628, 2450169; 434865, 2450147; 435006, 2450006; 435214,

(B) Excluding 1 area bounded by the following 11 points (<1 ha, 1 ac): Start at 434908, 2449290; 434890, 2449251; 434848, 2449239; 434839, 2449258; 434834, 2449277; 434833, 2449281; 434881, 2449297; 435011, 2449352; 435005, 2449310; 434948, 2449300; 434908, 2449290; return to starting point.

(C) **Note:** Map 145 follows:



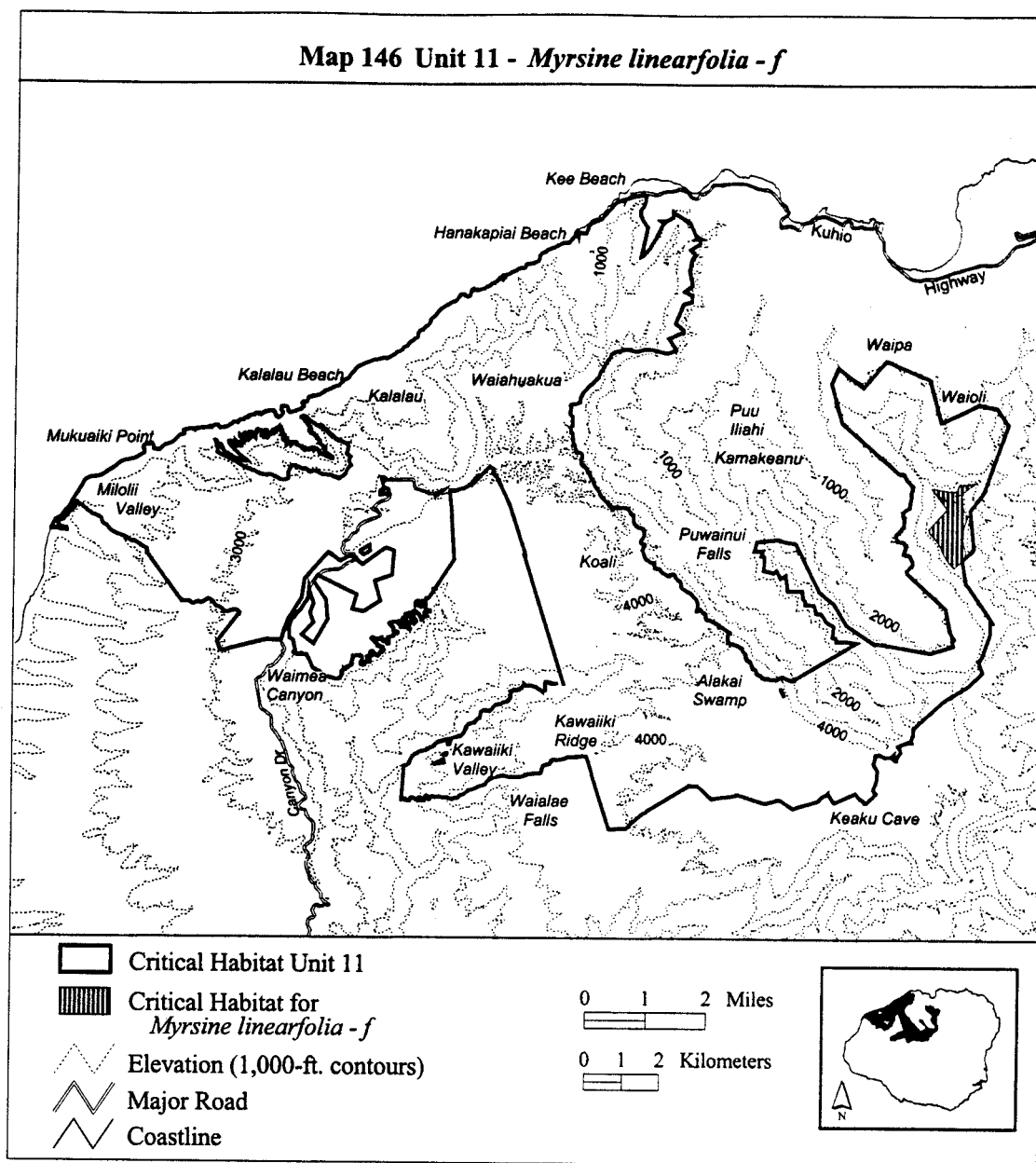
(cxlvii) Kauai 11—*Myrsine linearifolia*—f (135 ha; 334 ac)

(A) Unit consists of the following 30 boundary points: Start at 448856, 2449342; 448879, 2449102; 448899, 2448999; 449002, 2448742; 448894, 2448428; 448894, 2448078; 448920,

2447996; 448961, 2447831; 448961, 2447718; 448964, 2447690; 448881, 2447609; 448665, 2447400; 448662, 2447404; 448498, 2447589; 448384, 2447738; 448322, 2447877; 448286, 2448006; 448147, 2448186; 447988, 2448356; 447981, 2448434; 448470,

2448968; 448049, 2449503; 448160, 2449510; 448320, 2449476; 448515, 2449449; 448732, 2449449; 448783, 2449616; 448980, 2449613; 449250, 2449685; 448853, 2449375; return to starting point.

(B) **Note:** Map 146 follows:



(cxlvi) Kauai 11—*Nothocestrum peltatum*—a (427 ha; 1,056 ac)

(A) Unit consists of the following 418 boundary points: Start at 433577, 2447086; 433840, 2445888; 433837, 2445891; 433826, 2445896; 433791, 2445897; 433775, 2445901; 433758, 2445896; 433730, 2445871; 433708, 2445866; 433689, 2445873; 433675, 2445873; 433653, 2445857; 433650, 2445838; 433656, 2445820; 433690, 2445778; 433718, 2445762; 433735, 2445756; 433750, 2445748; 433756, 2445723; 433755, 2445706; 433759, 2445665; 433764, 2445656; 433781, 2445647; 433824, 2445642; 433851, 2445636; 433868, 2445628; 433879, 2445615; 433881, 2445595; 433867,

2445582; 433854, 2445582; 433827, 2445587; 433805, 2445594; 433787, 2445596; 433772, 2445590; 433763, 2445575; 433770, 2445538; 433773, 2445524; 433772, 2445519; 433762, 2445509; 433749, 2445500; 433732, 2445496; 433717, 2445497; 433708, 2445498; 433696, 2445499; 433686, 2445494; 433668, 2445480; 433655, 2445475; 433647, 2445474; 433635, 2445470; 433628, 2445467; 433621, 2445463; 433616, 2445456; 433609, 2445448; 433604, 2445445; 433598, 2445437; 433595, 2445433; 433595, 2445428; 433599, 2445420; 433611, 2445391; 433614, 2445376; 433620, 2445365; 433629, 2445356; 433637, 2445346; 433639, 2445336; 433641,

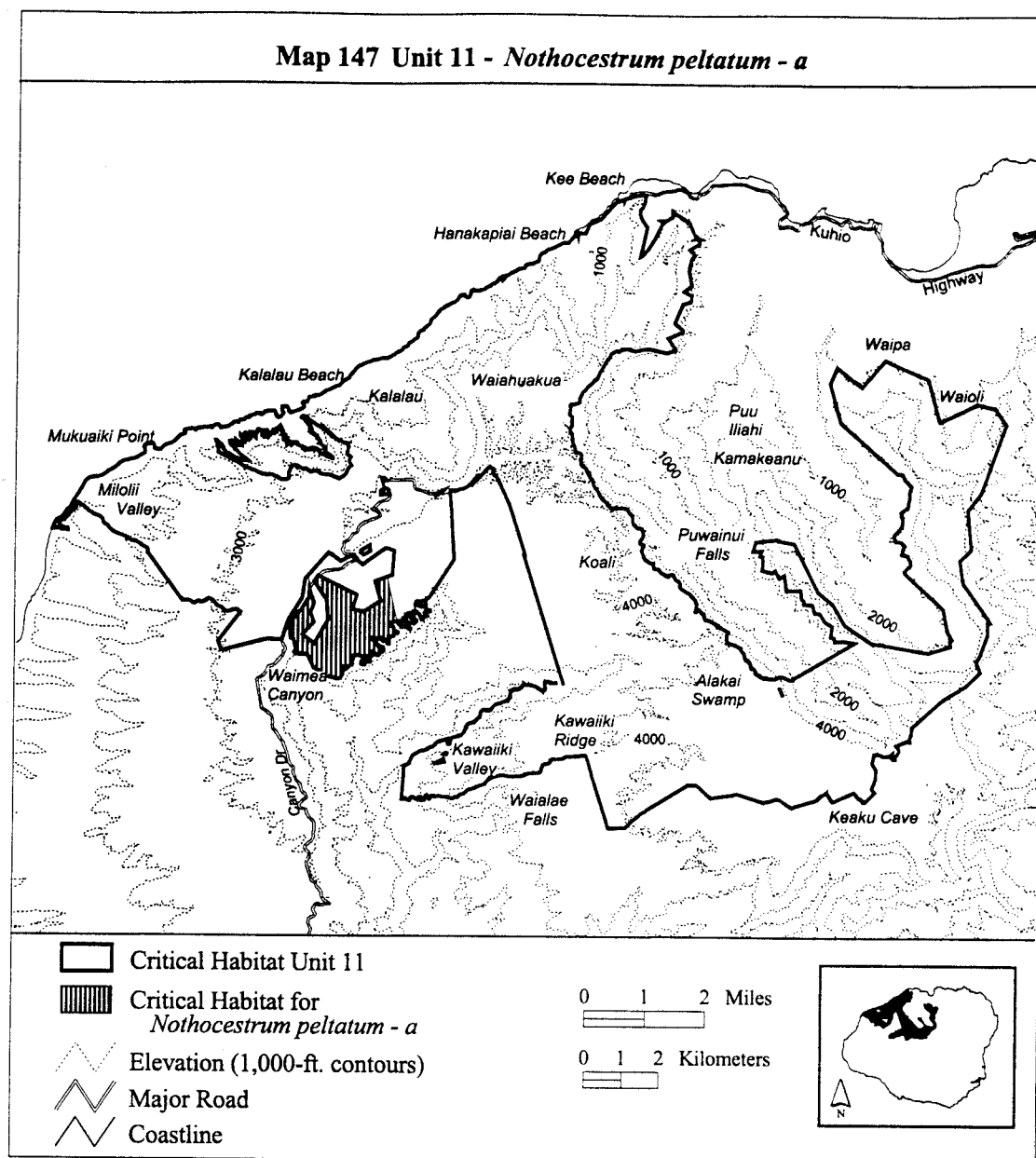
2445327; 433641, 2445319; 433637, 2445311; 433625, 2445307; 433619, 2445305; 433611, 2445307; 433604, 2445309; 433600, 2445313; 433591, 2445329; 433586, 2445341; 433582, 2445346; 433577, 2445353; 433573, 2445358; 433568, 2445366; 433567, 2445374; 433565, 2445381; 433564, 2445388; 433563, 2445395; 433562, 2445398; 433561, 2445399; 433556, 2445403; 433548, 2445403; 433527, 2445398; 433494, 2445388; 433477, 2445386; 433469, 2445388; 433463, 2445394; 433459, 2445402; 433456, 2445410; 433455, 2445416; 433452, 2445424; 433452, 2445436; 433451, 2445445; 433450, 2445450; 433449, 2445457; 433448, 2445461; 433446,

2445465; 433442, 2445467; 433438,
2445470; 433431, 2445468; 433426,
2445464; 433420, 2445459; 433413,
2445452; 433405, 2445444; 433396,
2445440; 433373, 2445432; 433344,
2445421; 433332, 2445422; 433317,
2445424; 433307, 2445428; 433288,
2445435; 433272, 2445440; 433260,
2445444; 433247, 2445450; 433242,
2445455; 433237, 2445459; 433233,
2445462; 433226, 2445466; 433221,
2445464; 433201, 2445464; 433193,
2445466; 433187, 2445464; 433181,
2445460; 433179, 2445455; 433179,
2445445; 433180, 2445437; 433192,
2445424; 433199, 2445416; 433225,
2445390; 433249, 2445376; 433262,
2445366; 433268, 2445357; 433274,
2445351; 433279, 2445342; 433287,
2445336; 433298, 2445333; 433312,
2445324; 433316, 2445313; 433323,
2445297; 433334, 2445273; 433342,
2445263; 433353, 2445252; 433362,
2445247; 433375, 2445242; 433386,
2445238; 433401, 2445232; 433411,
2445227; 433422, 2445223; 433432,
2445221; 433450, 2445220; 433460,
2445216; 433471, 2445210; 433482,
2445197; 433506, 2445166; 433514,
2445158; 433515, 2445153; 433512,
2445142; 433510, 2445136; 433508,
2445133; 433505, 2445128; 433500,
2445122; 433495, 2445122; 433487,
2445127; 433480, 2445134; 433474,
2445142; 433469, 2445149; 433467,
2445153; 433464, 2445154; 433457,
2445154; 433455, 2445147; 433452,
2445137; 433446, 2445124; 433444,
2445112; 433441, 2445104; 433438,
2445101; 433432, 2445099; 433423,
2445093; 433413, 2445082; 433395,
2445069; 433387, 2445061; 433382,
2445052; 433380, 2445044; 433380,
2445034; 433381, 2445023; 433380,
2445014; 433379, 2445000; 433377,
2444996; 433370, 2444993; 433363,
2444994; 433357, 2444996; 433351,
2444997; 433345, 2444992; 433337,
2444989; 433330, 2444988; 433322,
2444991; 433307, 2444999; 433290,
2445012; 433274, 2445023; 433259,
2445036; 433236, 2445061; 433216,
2445082; 433207, 2445091; 433201,
2445098; 433195, 2445100; 433189,

2445105; 433182, 2445104; 433177,
2445100; 433173, 2445094; 433172,
2445090; 433168, 2445082; 433164,
2445076; 433159, 2445071; 433154,
2445066; 433147, 2445060; 433142,
2445051; 433139, 2445045; 433140,
2445035; 433142, 2445021; 433156,
2444993; 433163, 2444982; 433166,
2444972; 433166, 2444968; 433160,
2444959; 433153, 2444957; 433144,
2444955; 433138, 2444957; 433130,
2444960; 433105, 2444969; 433093,
2444973; 433082, 2444973; 433074,
2444972; 433066, 2444967; 433062,
2444959; 433058, 2444952; 433059,
2444943; 433060, 2444935; 433064,
2444920; 433069, 2444904; 433075,
2444892; 433078, 2444882; 433084,
2444873; 433092, 2444865; 433104,
2444854; 433113, 2444850; 433129,
2444843; 433138, 2444838; 433143,
2444831; 433144, 2444823; 433144,
2444816; 433143, 2444809; 433135,
2444804; 433124, 2444798; 433119,
2444799; 433108, 2444802; 433094,
2444809; 433077, 2444818; 433063,
2444822; 433054, 2444823; 433052,
2444823; 433047, 2444824; 433039,
2444823; 433028, 2444822; 433019,
2444816; 433011, 2444803; 433002,
2444794; 432993, 2444790; 432986,
2444785; 432986, 2444775; 432988,
2444765; 432993, 2444751; 432985,
2444746; 432976, 2444744; 432960,
2444745; 432951, 2444751; 432948,
2444755; 432944, 2444759; 432939,
2444764; 432936, 2444764; 432925,
2444762; 432914, 2444760; 432908,
2444760; 432899, 2444762; 432891,
2444767; 432887, 2444774; 432887,
2444783; 432892, 2444797; 432903,
2444816; 432916, 2444838; 432921,
2444848; 432923, 2444864; 432929,
2444881; 432933, 2444897; 432934,
2444908; 432933, 2444926; 432933,
2444939; 432932, 2444945; 432930,
2444950; 432927, 2444958; 432921,
2444964; 432915, 2444967; 432907,
2444971; 432897, 2444974; 432883,
2444981; 432878, 2444986; 432872,
2444994; 432865, 2444999; 432855,
2445005; 432846, 2445005; 432838,
2445004; 432830, 2445001; 432821,
2444996; 432812, 2444993; 432801,

2444987; 432788, 2444983; 432772,
2444979; 432761, 2444976; 432744,
2444977; 432730, 2444975; 432714,
2444977; 432710, 2444979; 432706,
2444980; 432698, 2444983; 432692,
2444979; 432689, 2444973; 432688,
2444963; 432681, 2444920; 432680,
2444909; 432670, 2444895; 432664,
2444887; 432659, 2444878; 432657,
2444870; 432657, 2444858; 432655,
2444834; 432653, 2444828; 432648,
2444816; 432642, 2444806; 432640,
2444794; 432644, 2444781; 432650,
2444769; 432655, 2444759; 432657,
2444744; 432652, 2444736; 432645,
2444730; 432634, 2444723; 432606,
2444708; 432584, 2444702; 432554,
2444687; 432542, 2444682; 432534,
2444675; 432528, 2444668; 432520,
2444659; 432513, 2444645; 432507,
2444636; 432500, 2444628; 432490,
2444621; 432480, 2444618; 432473,
2444616; 432465, 2444617; 432453,
2444622; 432444, 2444625; 432437,
2444621; 432427, 2444610; 432417,
2444591; 432405, 2444574; 432401,
2444563; 432401, 2444556; 432401,
2444546; 432400, 2444539; 432399,
2444527; 432393, 2444513; 432387,
2444505; 432387, 2444498; 432388,
2444489; 432389, 2444479; 432386,
2444468; 432379, 2444452; 432369,
2444432; 432357, 2444408; 432350,
2444397; 432346, 2444391; 432343,
2444389; 432340, 2444387; 432336,
2444386; 432313, 2444377; 432297,
2444371; 432275, 2444356; 431885,
2444462; 431820, 2444555; 431615,
2444657; 431445, 2445015; 431137,
2445031; 431104, 2445078; 431153,
2445133; 431083, 2445402; 430991,
2445457; 430977, 2445767; 431060,
2445963; 431278, 2446215; 431483,
2446536; 431491, 2446759; 431622,
2446390; 431522, 2446121; 431622,
2445871; 431312, 2445542; 431632,
2445303; 432001, 2445941; 431961,
2446460; 431624, 2446959; 431732,
2447115; 432759, 2446609; 432659,
2446240; 432948, 2446150; 433397,
2446440; 433257, 2446958; return to
starting point.

(B) Note: Map 147 follows:



(cxlviii) Kauai 11—*Nothocestrum peltatum*—b (1,464 ha; 3,617 ac)

(A) Unit consists of the following 125 boundary points: Start at 433416, 2449553; 433413, 2449527; 433251, 2449306; 433081, 2449255; 432650, 2449255; 432630, 2449144; 432587, 2449098; 433711, 2448846; 432893, 2448778; 432382, 2448880; 432382, 2448693; 432638, 2448625; 432638, 2448387; 432433, 2448387; 432416, 2447995; 432432, 2447806; 432433, 2447791; 432672, 2447739; 432961, 2447978; 433336, 2448182; 433424, 2447780; 432918, 2447407; 432609, 2447647; 432320, 2447497; 432136, 2447629; 432001, 2447726; 431369, 2447027; 431298, 2446522; 430955,

2445963; 430827, 2445619; 430759, 2445406; 430405, 2445422; 429257, 2445126; 429144, 2445121; 429062, 2445354; 429654, 2446125; 429591, 2446167; 429485, 2446305; 429263, 2446389; 429094, 2446389; 428972, 2446421; 428912, 2446468; 428912, 2446468; 428911, 2446468; 428904, 2446474; 428793, 2446542; 428773, 2446550; 428747, 2446566; 427960, 2447503; 427660, 2447675; 427505, 2448103; 429733, 2449052; 429708, 2449170; 429968, 2449152; 430437, 2449352; 430418, 2449395; 430369, 2449433; 430355, 2449451; 430349, 2449466; 430335, 2449474; 430318, 2449477; 430307, 2449482; 430312, 2449517; 430313, 2449532; 430320,

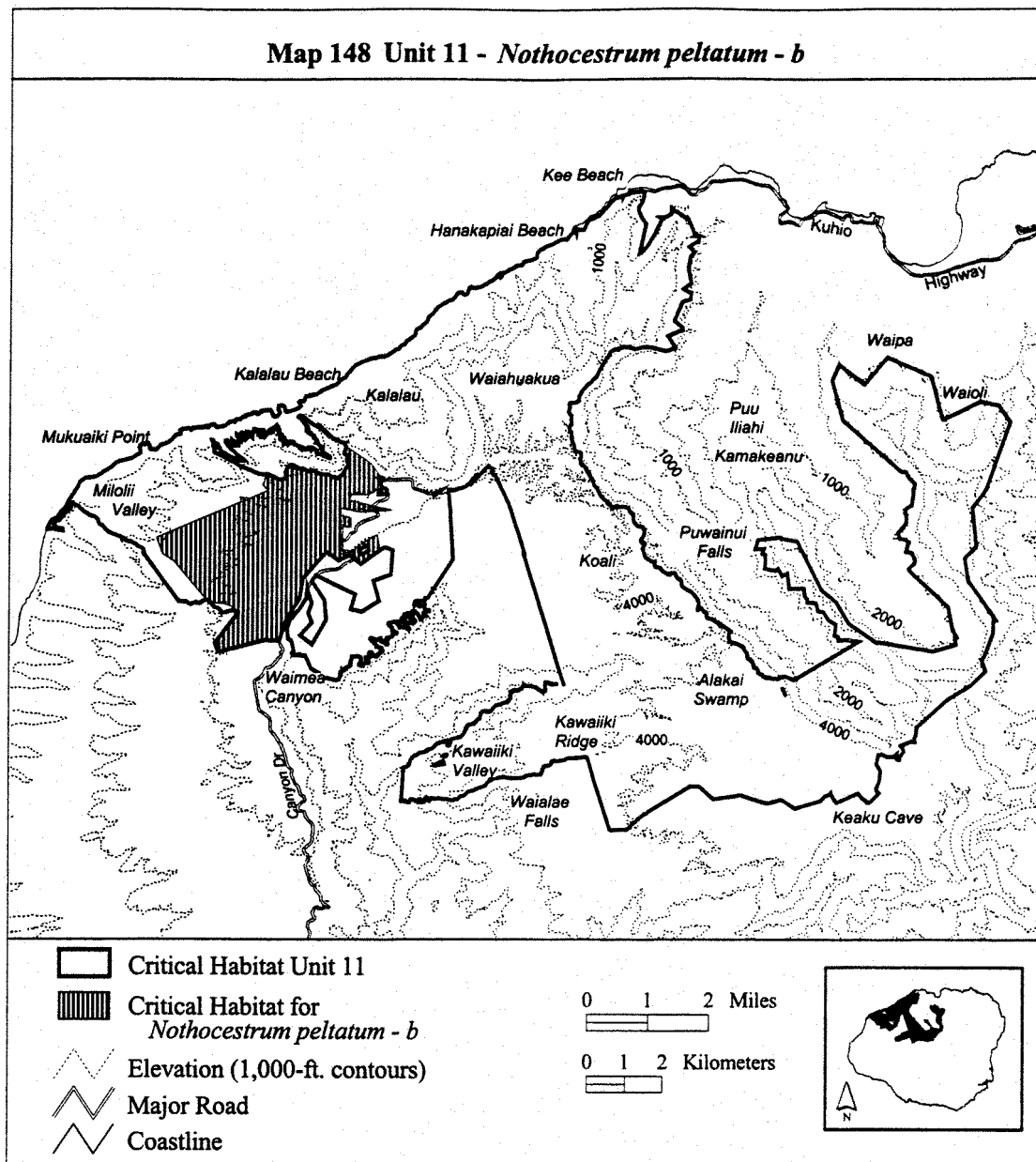
2449553; 430331, 2449565; 430346, 2449596; 430354, 2449622; 430355, 2449641; 430348, 2449666; 430376, 2449750; 430384, 2449766; 430406, 2449796; 430471, 2449787; 430527, 2449754; 430583, 2449736; 430635, 2449693; 430696, 2449656; 430720, 2449646; 430819, 2449646; 430899, 2449674; 430918, 2449717; 430904, 2449834; 430927, 2449905; 430955, 2449985; 430993, 2450032; 431068, 2450041; 431153, 2450008; 431238, 2449970; 431285, 2449942; 431360, 2449956; 431449, 2449886; 431497, 2449867; 431605, 2449895; 431657, 2449890; 431699, 2449876; 431765, 2449810; 431864, 2449801; 431981, 2449792; 432047, 2449787; 432113,

2449740; 432217, 2449712; 432259,
2449679; 432344, 2449744; 432419,
2449806; 432471, 2449904; 432504,
2449961; 432579, 2450036; 432551,
2450083; 432523, 2450130; 432523,
2450182; 432565, 2450262; 432523,
2450304; 432475, 2450313; 432452,

2450337; 432461, 2450375; 432480,
2450426; 432490, 2450478; 432501,
2450529; 432504, 2450525; 432504,
2450527; 433152, 2450085; 433399,
2449754; 433399, 2449709; 433419,
2449599; return to starting point.

(B) Excluding 1 area bounded by the
following 4 points (3 ha, 8 ac): Start at
433109, 2447775; 432932, 2447668;
432827, 2447751; 433094, 2447922;
return to starting point.

(C) Note: Map 148 follows:



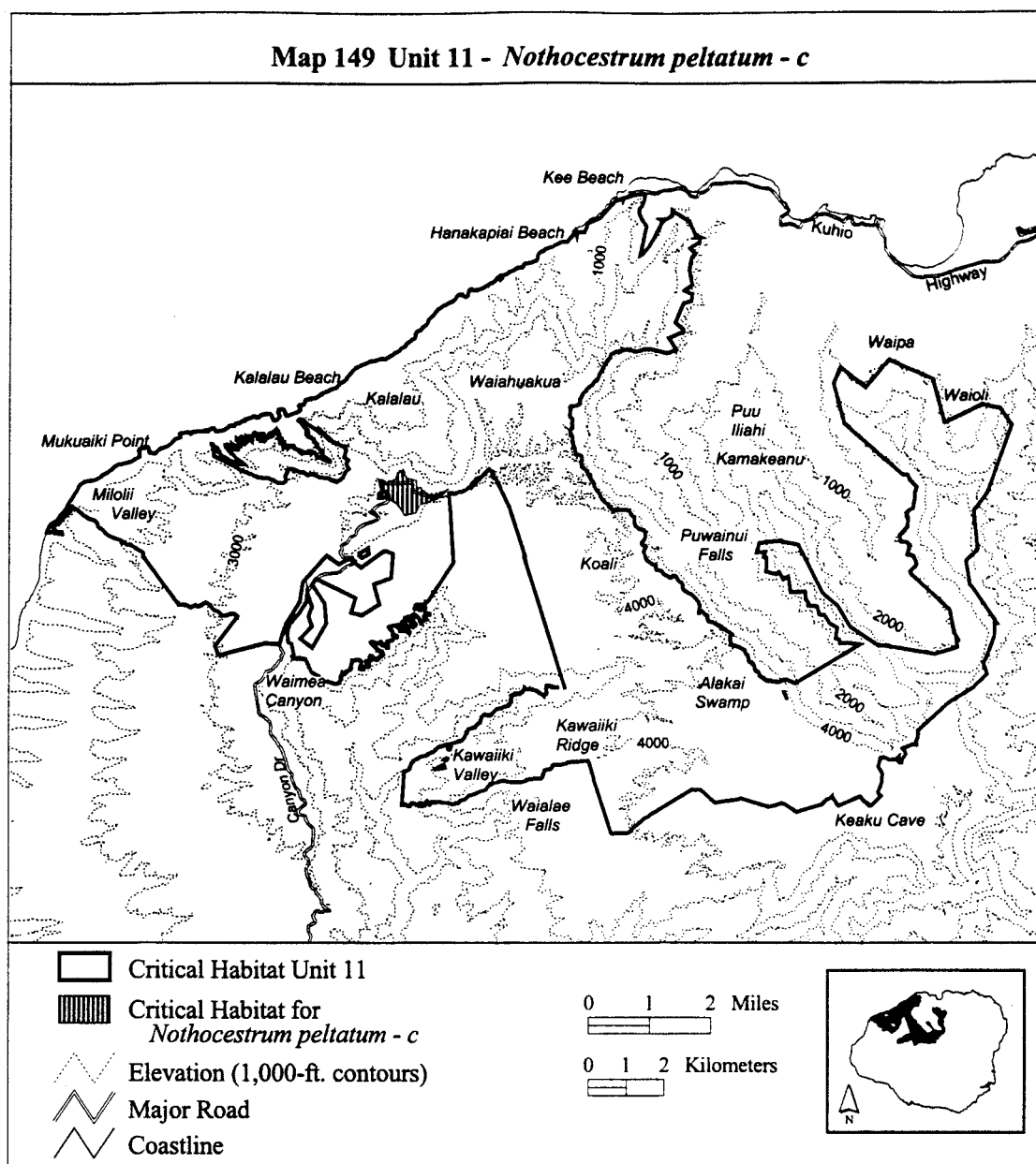
(cxlix) Kauai 11—*Nothocestrum peltatum*—c (80 ha; 198 ac)

(A) Unit consists of the following 36 boundary points: Start at 433467, 2449537; 433459, 2449601; 433480, 2449629; 433550, 2449670; 433792, 2449721; 433887, 2449924; 434015, 2449995; 434094, 2449780; 434354,

2449721; 434409, 2449470; 434457, 2449541; 434688, 2449346; 434987, 2449346; 434991, 2449346; 434991, 2449344; 434988, 2449343; 434881, 2449297; 434833, 2449281; 434834, 2449277; 434839, 2449258; 434842, 2449253; 434844, 2449248; 434839, 2449242; 434833, 2449239; 434684,

2449151; 434469, 2449071; 434362, 2448856; 434336, 2448850; 434055, 2448781; 433923, 2449012; 433812, 2449135; 433688, 2449191; 433660, 2449263; 433664, 2449351; 433588, 2449442; 433509, 2449482; return to starting point.

(B) Note: Map 149 follows:



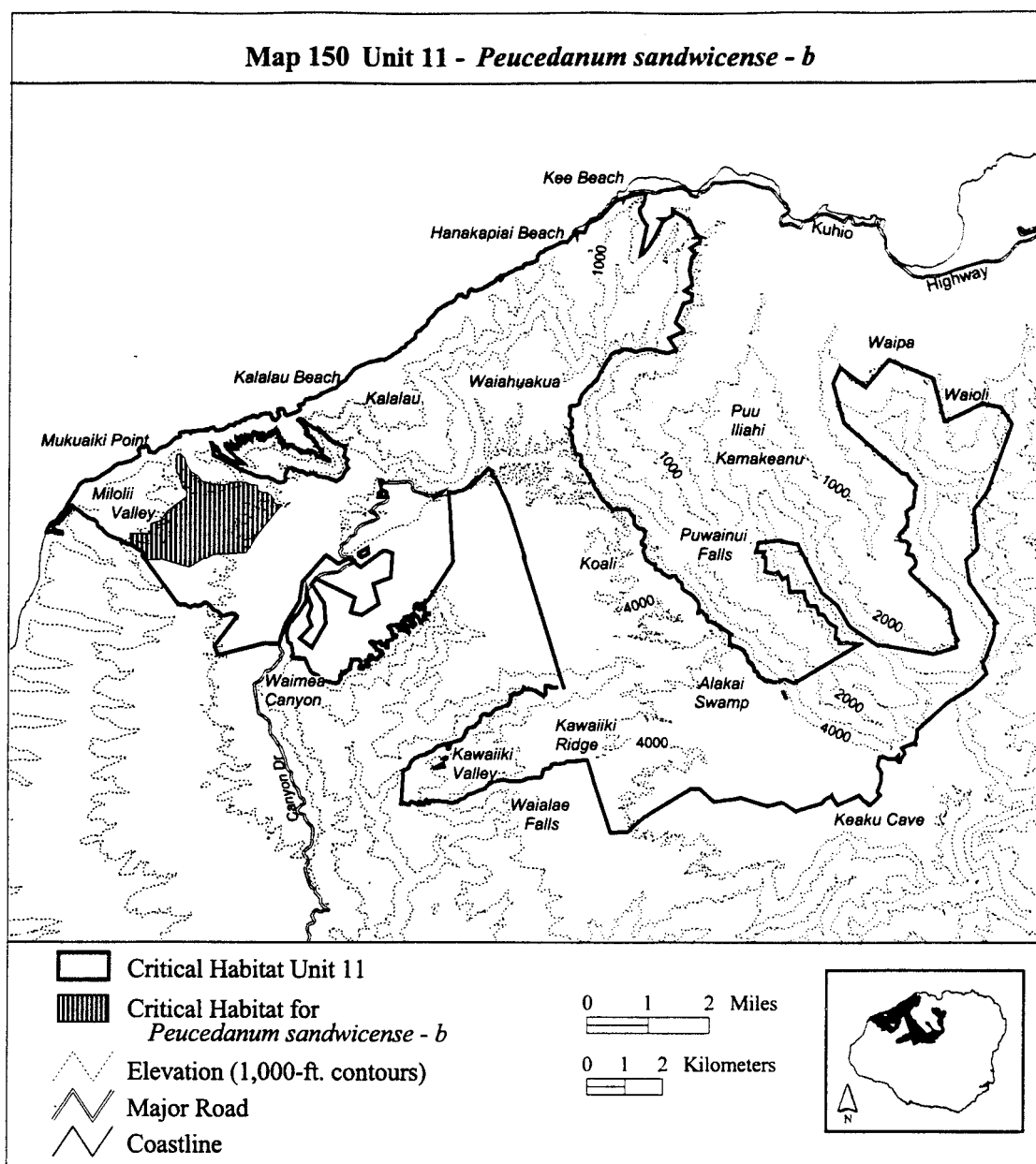
(cl) Kauai 11—*Peucedanum sandwicense*—b (579 ha; 1,430 ac)

(A) Unit consists of the following 91 boundary points: Start at 426832, 2447995; 426843, 2448011; 426810, 2448288; 427346, 2448293; 427357, 2448542; 427623, 2448630; 427799, 2448868; 428291, 2449244; 428313, 2449309; 428313, 2449411; 428205, 2449507; 428142, 2449672; 428131, 2449814; 428029, 2449922; 428017, 2449990; 428017, 2450120; 428017, 2450279; 428034, 2450399; 428142, 2450404; 428245, 2450302; 428302, 2450155; 428364, 2450024; 428409, 2449944; 428523, 2449882; 428637, 2449819; 428705, 2449689; 428847,

2449649; 429000, 2449604; 429194, 2449587; 429341, 2449592; 429501, 2449649; 429677, 2449672; 429876, 2449649; 430006, 2449598; 430009, 2449587; 430011, 2449592; 430066, 2449586; 430177, 2449564; 430182, 2449481; 430221, 2449420; 430359, 2449371; 430420, 2449392; 430437, 2449371; 430430, 2449364; 430451, 2449363; 430463, 2449355; 430474, 2449342; 430485, 2449333; 430527, 2449321; 430531, 2449315; 430531, 2449310; 430534, 2449307; 430545, 2449277; 430559, 2449254; 430604, 2449229; 430616, 2449214; 430623, 2449194; 430623, 2449173; 430616, 2449156; 430619, 2449138; 430629,

2449119; 430643, 2449106; 430666, 2449092; 430680, 2449072; 430824, 2449050; 430232, 2448299; 429895, 2447790; 429381, 2447752; 429032, 2447740; 428839, 2447641; 428767, 2447635; 428380, 2447414; 427650, 2447613; 427235, 2447592; 427185, 2447661; 427161, 2447669; 427157, 2447676; 427157, 2447711; 427175, 2447754; 427176, 2447775; 427171, 2447800; 427160, 2447815; 427124, 2447837; 427084, 2447847; 427039, 2447867; 426997, 2447892; 426981, 2447902; 426958, 2447923; 426944, 2447941; 426907, 2447965; 426847, 2447992; return to starting point.

(B) Note: Map 150 follows:



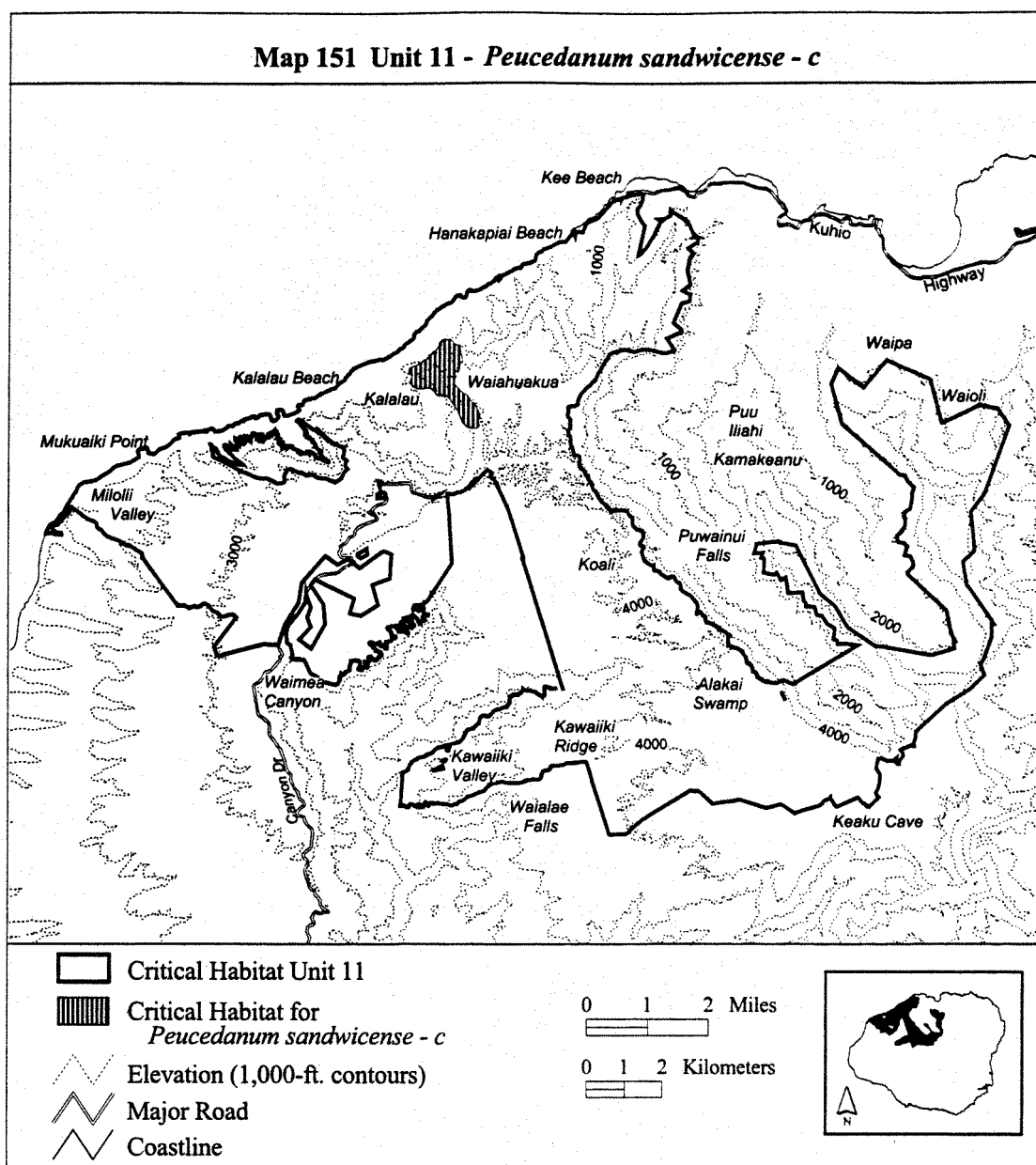
(cli) Kauai 11—*Peucedanum sandwicense*—c (181 ha; 447 ac)

(A) Unit consists of the following 48 boundary points: Start at 435634, 2452896; 435550, 2452817; 435535, 2452664; 435497, 2452553; 435413, 2452410; 435407, 2452304; 435487, 2452193; 435630, 2452061; 435773, 2451976; 435831, 2451875; 435969, 2451706; 436054, 2451547; 436080,

2451431; 436043, 2451304; 436064, 2451177; 435995, 2451108; 435757, 2451140; 435619, 2451272; 435503, 2451574; 435376, 2451759; 435270, 2451902; 435206, 2451981; 434989, 2451976; 434904, 2452029; 434851, 2452114; 434745, 2452198; 434544, 2452161; 434438, 2452167; 434295, 2452225; 434226, 2452320; 434258, 2452437; 434306, 2452516; 434216,

2452564; 434189, 2452680; 434269, 2452749; 434385, 2452775; 434512, 2452849; 434629, 2452913; 434714, 2452971; 434804, 2453108; 434909, 2453188; 434989, 2453272; 435010, 2453389; 435090, 2453452; 435301, 2453468; 435423, 2453341; 435552, 2453315; 435559, 2453209; return to starting point.

(B) **Note:** Map 151 follows:



(cli) Kauai 11—*Phyllostegia knudsenii*—a (297 ha, 735 ac)

(A) Unit consists of the following 265 boundary points: Start at 438184,

2444684; 438270, 2444792; 438407, 2444861; 438555, 2444861; 438624, 2444693; 438899, 2444575; 438978, 2444733; 439185, 2444831; 439490, 2444929; 439598, 2444880; 439598, 2445136; 439795, 2445214; 440110, 2445136; 440316, 2444919; 440503, 2445047; 440661, 2445106; 440788, 2445096; 440759, 2444831; 440720, 2444949; 440474, 2444850; 440493, 2444762; 440188, 2444693; 440188, 2444791; 439933, 2444880; 439962, 2444723; 439933, 2444605; 439775, 2444418; 439490, 2444349; 439362, 2444202; 439195, 2444064; 439037,

2444054; 439027, 2443818; 438949, 2443946; 438634, 2444025; 438516, 2443897; 438358, 2443858; 438348, 2443749; 438034, 2443681; 437984, 2443808; 437384, 2443720; 437571, 2443494; 437473, 2443268; 437227, 2443140; 437069, 2443228; 436774, 2443228; 435545, 2442770; 435532, 2442855; 435534, 2442855; 435543, 2442858; 435556, 2442862; 435571, 2442867; 435585, 2442876; 435598, 2442885; 435608, 2442891; 435619, 2442899; 435627, 2442904; 435642, 2442920; 435658, 2442932; 435668, 2442948; 435673, 2442959; 435681, 2442977; 435688, 2442995; 435693, 2443006; 435698, 2443024; 435704, 2443036; 435708, 2443047; 435715, 2443064; 435722, 2443078; 435725,

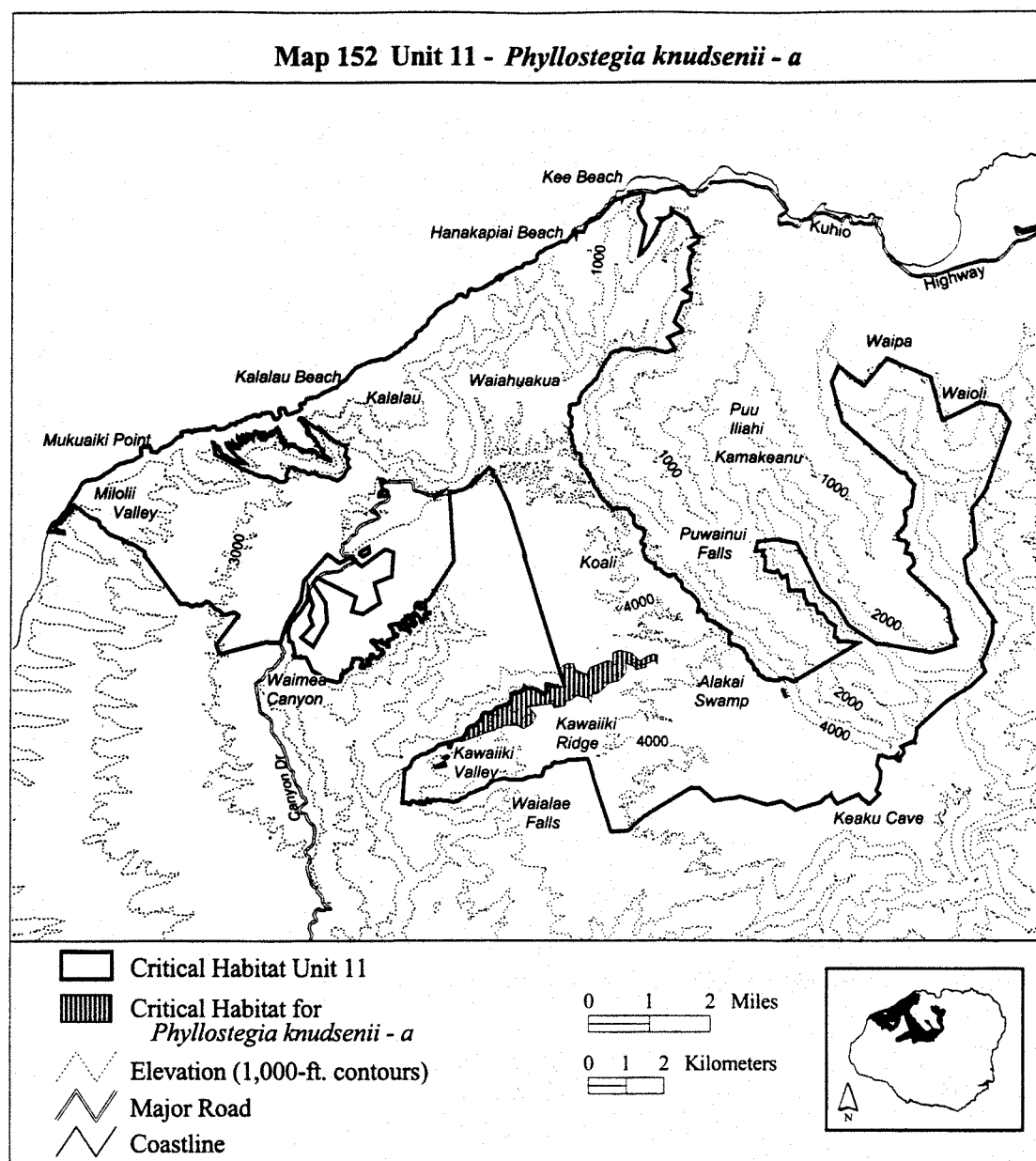
2443086; 435729, 2443093; 435735, 2443103; 435738, 2443112; 435743, 2443127; 435749, 2443138; 435753, 2443149; 435757, 2443155; 435766, 2443169; 435778, 2443179; 435790, 2443186; 435804, 2443188; 435821, 2443194; 435842, 2443199; 435861, 2443202; 435874, 2443204; 435889, 2443208; 435904, 2443211; 435933, 2443223; 435942, 2443232; 435949, 2443246; 435958, 2443255; 435969, 2443263; 435979, 2443271; 435993, 2443281; 436010, 2443297; 436032, 2443316; 436048, 2443332; 436064, 2443343; 436080, 2443358; 436089, 2443375; 436095, 2443390; 436100, 2443403; 436107, 2443421; 436113, 2443456; 436118, 2443477; 436123, 2443502; 436134, 2443520; 436146,

2443534; 436160, 2443543; 436175,
2443554; 436190, 2443560; 436213,
2443563; 436227, 2443563; 436240,
2443562; 436254, 2443557; 436265,
2443552; 436274, 2443547; 436287,
2443540; 436300, 2443537; 436315,
2443532; 436328, 2443529; 436337,
2443528; 436348, 2443531; 436357,
2443536; 436369, 2443546; 436380,
2443558; 436392, 2443572; 436403,
2443585; 436421, 2443611; 436438,
2443631; 436460, 2443655; 436478,
2443676; 436497, 2443688; 436518,
2443696; 436534, 2443700; 436558,
2443707; 436576, 2443711; 436597,
2443714; 436611, 2443716; 436630,
2443718; 436644, 2443720; 436655,
2443724; 436666, 2443731; 436678,
2443742; 436697, 2443756; 436708,
2443763; 436726, 2443769; 436745,
2443772; 436758, 2443775; 436771,
2443776; 436788, 2443776; 436799,
2443778; 436808, 2443781; 436818,
2443785; 436823, 2443786; 436829,
2443790; 436837, 2443797; 436841,
2443801; 436845, 2443807; 436852,
2443819; 436861, 2443831; 436870,

2443847; 436882, 2443863; 436890,
2443877; 436900, 2443900; 436911,
2443923; 436914, 2443936; 436914,
2443948; 436913, 2443962; 436910,
2443981; 436908, 2443995; 436908,
2444013; 436911, 2444027; 436918,
2444040; 436926, 2444047; 436933,
2444055; 436942, 2444065; 436951,
2444073; 436961, 2444084; 436969,
2444094; 436975, 2444098; 436983,
2444102; 436994, 2444107; 437009,
2444108; 437026, 2444105; 437049,
2444100; 437067, 2444092; 437076,
2444089; 437106, 2444090; 437119,
2444096; 437128, 2444104; 437133,
2444112; 437137, 2444122; 437144,
2444130; 437156, 2444135; 437169,
2444141; 437183, 2444150; 437191,
2444154; 437202, 2444165; 437212,
2444177; 437228, 2444198; 437239,
2444213; 437245, 2444227; 437254,
2444239; 437263, 2444246; 437278,
2444240; 437294, 2444234; 437310,
2444225; 437332, 2444217; 437351,
2444217; 437370, 2444223; 437391,
2444223; 437412, 2444226; 437428,
2444226; 437445, 2444223; 437462,

2444219; 437482, 2444211; 437497,
2444205; 437541, 2444190; 437563,
2444183; 437578, 2444179; 437593,
2444170; 437610, 2444160; 437624,
2444146; 437636, 2444132; 437651,
2444119; 437671, 2444112; 437691,
2444102; 437703, 2444093; 437722,
2444082; 437732, 2444069; 437749,
2444061; 437758, 2444058; 437768,
2444060; 437780, 2444066; 437810,
2444080; 437821, 2444088; 437831,
2444100; 437833, 2444111; 437835,
2444126; 437833, 2444139; 437827,
2444163; 437822, 2444185; 437820,
2444206; 437818, 2444236; 437824,
2444265; 437828, 2444292; 437836,
2444314; 437843, 2444322; 437854,
2444327; 437871, 2444328; 437887,
2444323; 437909, 2444314; 437933,
2444302; 437960, 2444289; 437984,
2444274; 438007, 2444260; 438028,
2444258; 438048, 2444258; 438072,
2444260; 438087, 2444266; 438109,
2444271; 438133, 2444273; 438164,
2444270; 438196, 2444263; 438335,
2444214; return to starting point.

(B) **Note:** Map 152 follows:



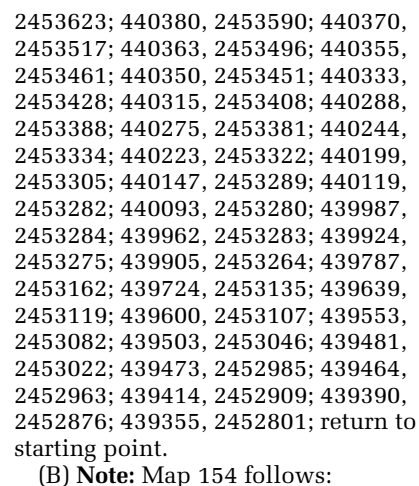
(cliii) Kauai 11—*Phyllostegia waimeae*—a (364 ha; 901 ac)

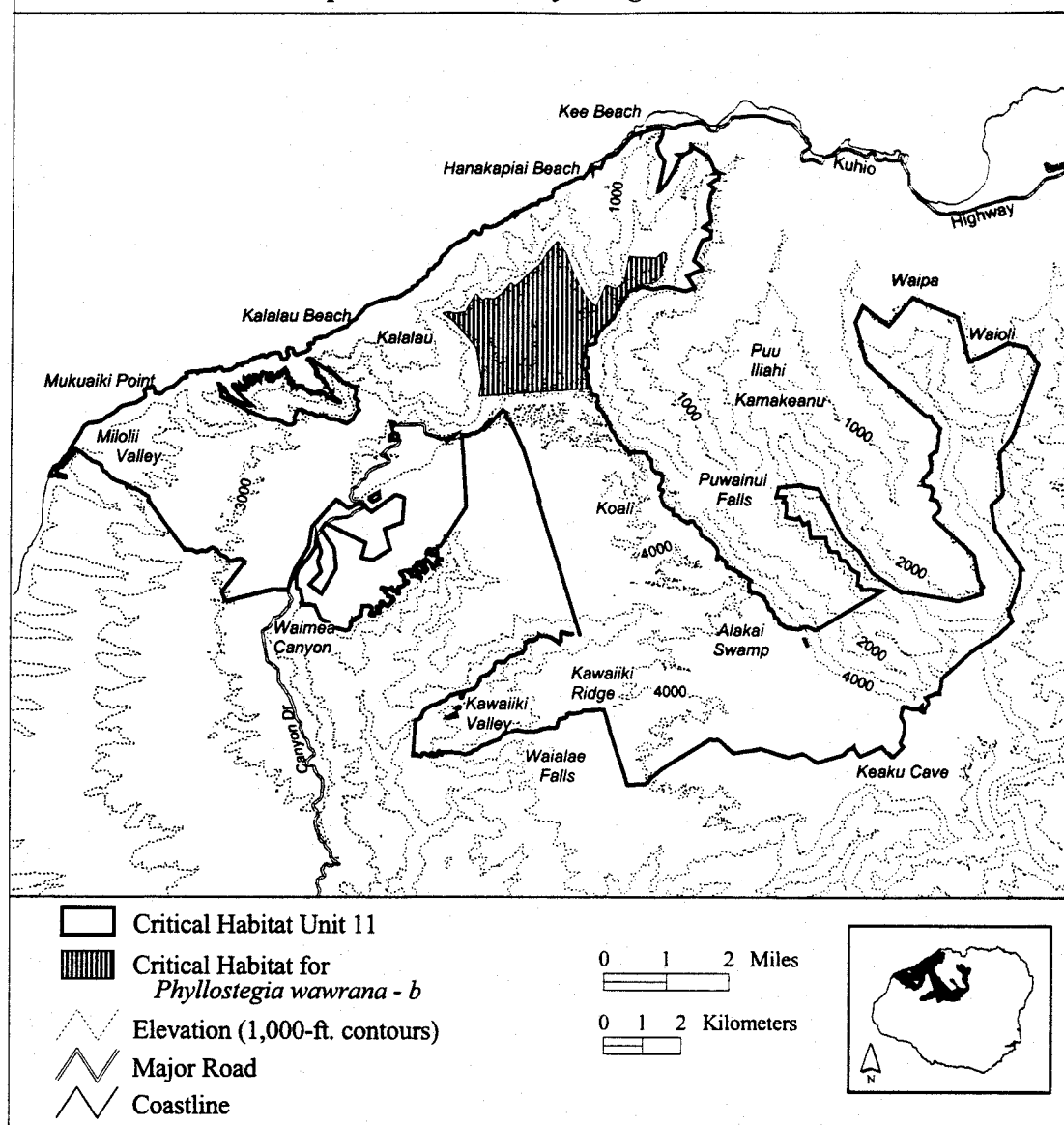
(A) Unit consists of the following 30 boundary points: Start at 437962, 2444106; 439160, 2443328; 439020, 2443250; 439191, 2443203; 439238, 2443125; 439168, 2443024; 439316,

2443017; 439440, 2442729; 439378, 2442635; 436857, 2442223; 436732, 2442270; 436483, 2442441; 436654, 2442636; 436102, 2442659; 436086, 2442721; 436188, 2442916; 436452, 2442939; 436553, 2443095; 436444, 2443235; 436522, 2443367; 436857,

2443468; 437067, 2443336; 437176, 2443359; 437160, 2443499; 437246, 2443585; 437246, 2443733; 437246, 2443888; 437479, 2443943; 437487, 2444013; 437760, 2443935; return to starting point.

(B) **Note:** Map 153 follows:



Map 154 Unit 11 - *Phyllostegia wawrana* - b

(clv) Kauai 11—*Phyllostegia wawrana*—
c (108 ha; 268 ac)

(A) Unit consists of the following 254
boundary points: Start at 436283,

2443540; 436283, 2443542; 436287,
2443540; 436300, 2443537; 436315,
2443532; 436328, 2443529; 436337,
2443528; 436348, 2443531; 436357,
2443536; 436369, 2443546; 436380,
2443558; 436392, 2443572; 436403,
2443585; 436421, 2443611; 436438,
2443631; 436460, 2443655; 436478,
2443676; 436497, 2443688; 436518,
2443696; 436534, 2443700; 436558,
2443707; 436576, 2443711; 436597,
2443714; 436611, 2443716; 436630,
2443718; 436644, 2443720; 436655,
2443724; 436666, 2443731; 436678,
2443742; 436697, 2443756; 436708,

2443763; 436726, 2443769; 436745,
2443772; 436758, 2443775; 436771,
2443776; 436788, 2443776; 436799,
2443778; 436808, 2443781; 436818,
2443785; 436823, 2443786; 436829,
2443790; 436837, 2443797; 436841,
2443801; 436845, 2443807; 436852,
2443819; 436861, 2443831; 436870,
2443847; 436882, 2443863; 436890,
2443877; 436900, 2443900; 436911,
2443923; 436914, 2443936; 436914,
2443948; 436913, 2443962; 436910,
2443981; 436908, 2443995; 436908,
2444013; 436911, 2444027; 436918,
2444040; 436926, 2444047; 436933,
2444055; 436942, 2444065; 436951,
2444073; 436961, 2444084; 436969,
2444094; 436975, 2444098; 436983,
2444102; 436994, 2444107; 437009,

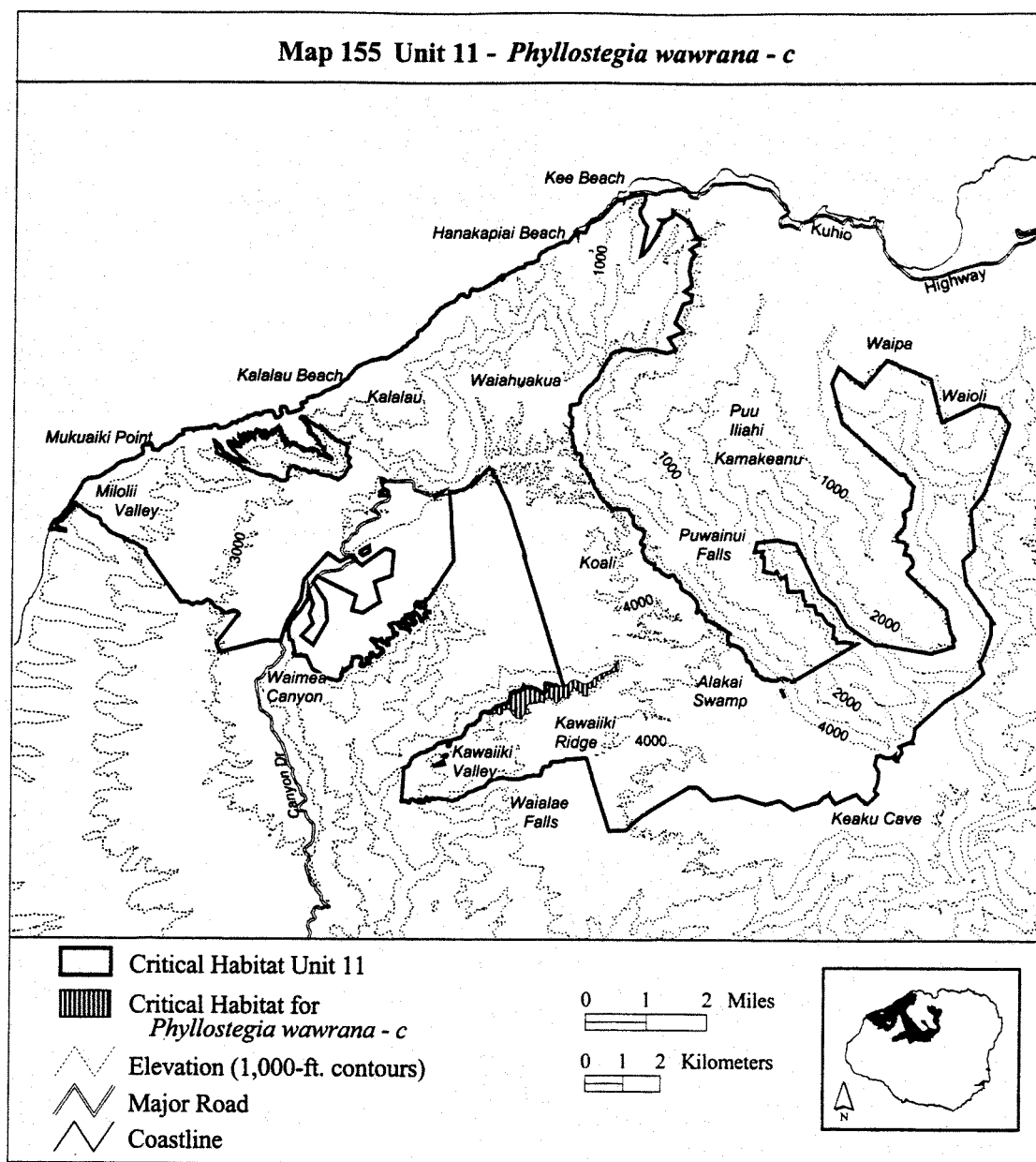
2444108; 437026, 2444105; 437049,
2444100; 437067, 2444092; 437076,
2444089; 437106, 2444090; 437119,
2444096; 437128, 2444104; 437133,
2444112; 437137, 2444122; 437144,
2444130; 437156, 2444135; 437169,
2444141; 437183, 2444150; 437191,
2444154; 437202, 2444165; 437212,
2444177; 437228, 2444198; 437239,
2444213; 437245, 2444227; 437254,
2444239; 437263, 2444246; 437278,
2444240; 437294, 2444234; 437310,
2444225; 437332, 2444217; 437351,
2444217; 437370, 2444223; 437391,
2444223; 437412, 2444226; 437428,
2444226; 437445, 2444223; 437462,
2444219; 437482, 2444211; 437497,
2444205; 437541, 2444190; 437563,
2444183; 437578, 2444179; 437593,

2444170; 437610, 2444160; 437624,
2444146; 437636, 2444132; 437651,
2444119; 437671, 2444112; 437691,
2444102; 437703, 2444093; 437722,
2444082; 437732, 2444069; 437749,
2444061; 437758, 2444058; 437768,
2444060; 437780, 2444066; 437810,
2444080; 437821, 2444088; 437831,
2444100; 437833, 2444111; 437835,
2444126; 437833, 2444139; 437827,
2444163; 437822, 2444185; 437820,
2444206; 437818, 2444236; 437824,
2444265; 437828, 2444292; 437836,
2444314; 437843, 2444322; 437854,
2444327; 437871, 2444328; 437887,
2444323; 437909, 2444314; 437933,
2444302; 437960, 2444289; 437984,
2444274; 438007, 2444260; 438028,
2444258; 438048, 2444258; 438072,
2444260; 438087, 2444266; 438109,
2444271; 438133, 2444273; 438164,
2444270; 438196, 2444263; 438335,
2444214; 438331, 2444225; 438331,
2444225; 438361, 2444238; 438459,
2444323; 438527, 2444400; 438642,
2444421; 438749, 2444353; 438817,

2444310; 438876, 2444310; 438957,
2444306; 439085, 2444387; 439102,
2444455; 439230, 2444515; 439302,
2444566; 439379, 2444595; 439562,
2444668; 439660, 2444766; 439694,
2444817; 439715, 2444893; 439770,
2444944; 439770, 2444872; 439787,
2444795; 439787, 2444706; 439779,
2444668; 439707, 2444651; 439447,
2444532; 439400, 2444506; 439396,
2444438; 439336, 2444455; 439285,
2444370; 439242, 2444408; 439187,
2444357; 439208, 2444306; 439217,
2444276; 439187, 2444263; 439132,
2444221; 439093, 2444246; 439072,
2444238; 439051, 2444204; 439055,
2444187; 439025, 2444191; 438995,
2444204; 438949, 2444195; 438949,
2444144; 438966, 2444093; 438974,
2443991; 438906, 2443970; 438846,
2444012; 438812, 2444072; 438757,
2444076; 438655, 2444170; 438604,
2444200; 438553, 2444178; 438519,
2444115; 438472, 2444072; 438480,
2443983; 438412, 2443927; 438370,
2443923; 438272, 2443949; 438229,

2443855; 438191, 2443851; 438174,
2443808; 438118, 2443800; 438054,
2443864; 438059, 2443932; 437991,
2443893; 437974, 2443898; 437927,
2443928; 437871, 2443910; 437782,
2443813; 437744, 2443830; 437688,
2443842; 437637, 2443825; 437586,
2443787; 437497, 2443796; 437467,
2443774; 437412, 2443770; 437343,
2443719; 437343, 2443659; 437382,
2443625; 437416, 2443523; 437373,
2443510; 437305, 2443523; 437254,
2443481; 437207, 2443366; 437143,
2443374; 437071, 2443387; 437028,
2443434; 436922, 2443549; 436871,
2443647; 436815, 2443634; 436786,
2443613; 436709, 2443621; 436692,
2443553; 436692, 2443515; 436637,
2443468; 436594, 2443485; 436547,
2443515; 436496, 2443515; 436445,
2443485; 436390, 2443485; 436309,
2443477; 436279, 2443506; return to
starting point.

(B) **Note:** Map 155 follows:



(clvi) Kauai 11—*Phyllostegia wawrana*—d (251 ha; 619 ac)

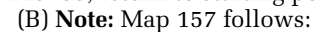
(A) Unit consists of the following 46 boundary points: Start at 433484, 2449698; 433602, 2449656; 433646, 2449236; 433339, 2448655; 432657, 2448174; 432163, 2448681; 432122, 2448722; 431444, 2449890; 431449, 2449886; 431497, 2449867; 431510, 2449870; 431519, 2449867; 431617, 2449892; 431723, 2449853; 431765, 2449810; 431860, 2449801; 432043,

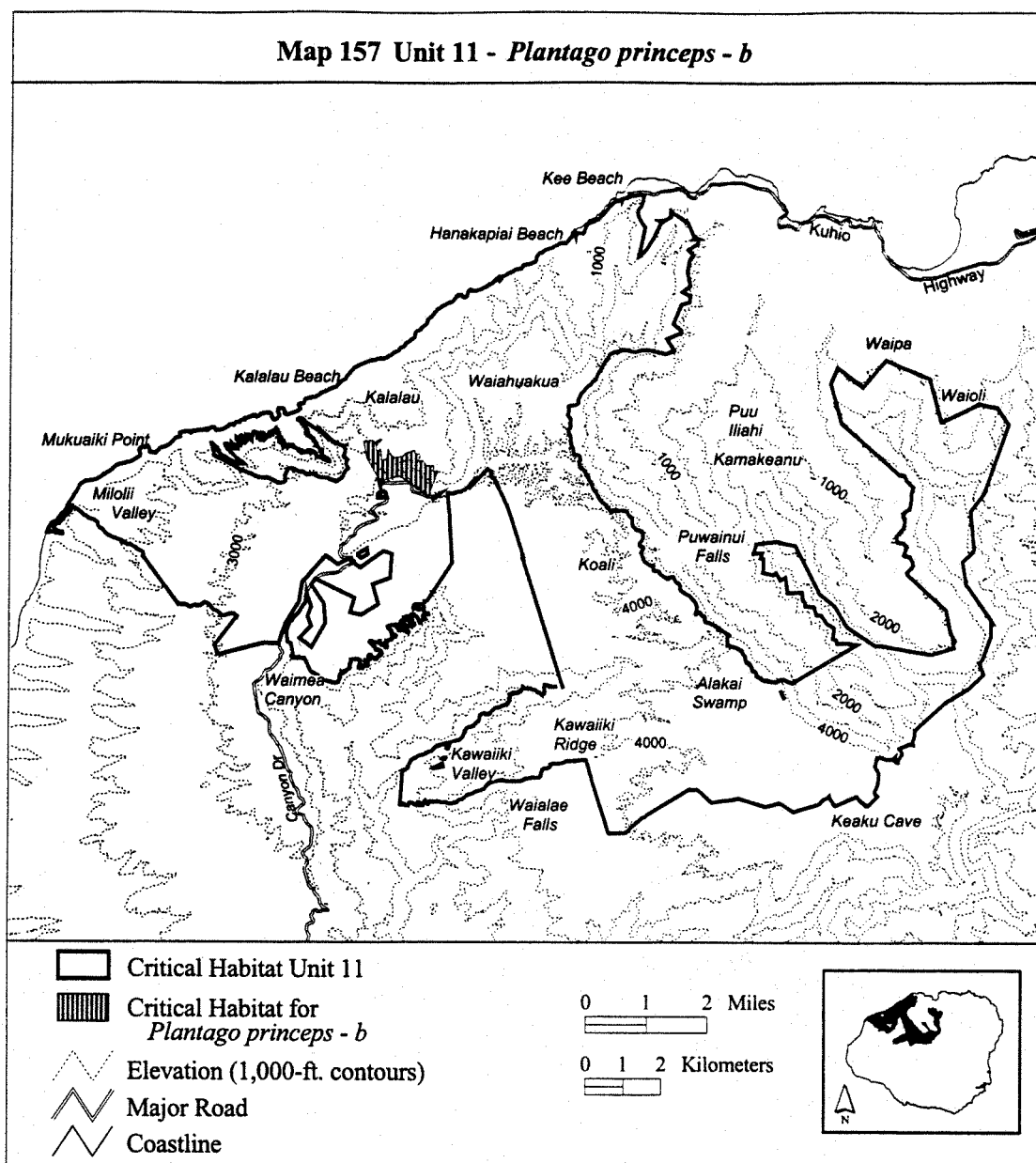
2449733; 432311, 2449650; 432411, 2449775; 432545, 2449959; 432548, 2450005; 432579, 2450036; 432552, 2450080; 432553, 2450092; 432527, 2450190; 432565, 2450262; 432523, 2450304; 432495, 2450310; 432495, 2450310; 432489, 2450474; 432490, 2450478; 432500, 2450525; 432509, 2450514; 432509, 2450514; 432595, 2450402; 432946, 2450251; 433218, 2450018; 433402, 2449727; 433458, 2449707; 433436, 2449707; 433399, 2449709; 433419, 2449599; 433426,

2449556; 433440, 2449604; 433457, 2449622; 433480, 2449629; return to starting point.

(B) Excluding 1 area bounded by the following 10 points (3 ha, 8 ac): Start at 433368, 2449292; 433367, 2449352; 433448, 2449426; 433546, 2449412; 433567, 2449398; 433589, 2449323; 433612, 2449262; 433588, 2449244; 433567, 2449260; 433369, 2449255; return to starting point.

(C) **Note:** Map 156 follows:





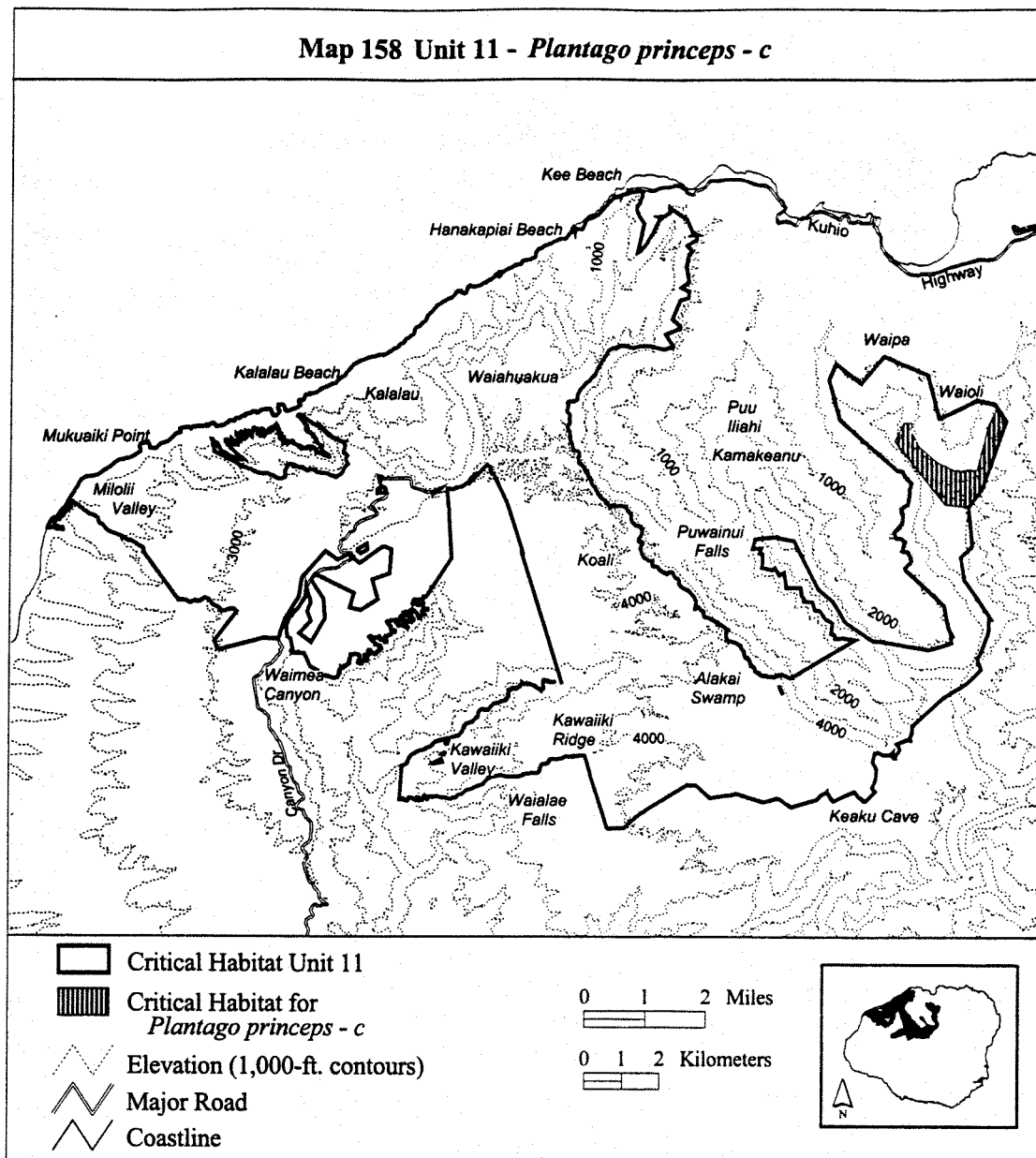
(clviii) Kauai 11—*Plantago princeps*—c
(244 ha; 603 ac)

(A) Unit consists of the following 17
boundary points: Start at 448456,

2448986; 447125, 2450677; 447365,
2451166; 447582, 2451166; 447538,
2450979; 447777, 2450536; 448254,
2450127; 448731, 2449889; 449310,
2449923; 449617, 2451148; 449833,

2451517; 450063, 2451208; 449872,
2450704; 449708, 2450232; 449423,
2449382; 449245, 2449149; 449068,
2448933; return to starting point.

(B) **Note:** Map 158 follows:



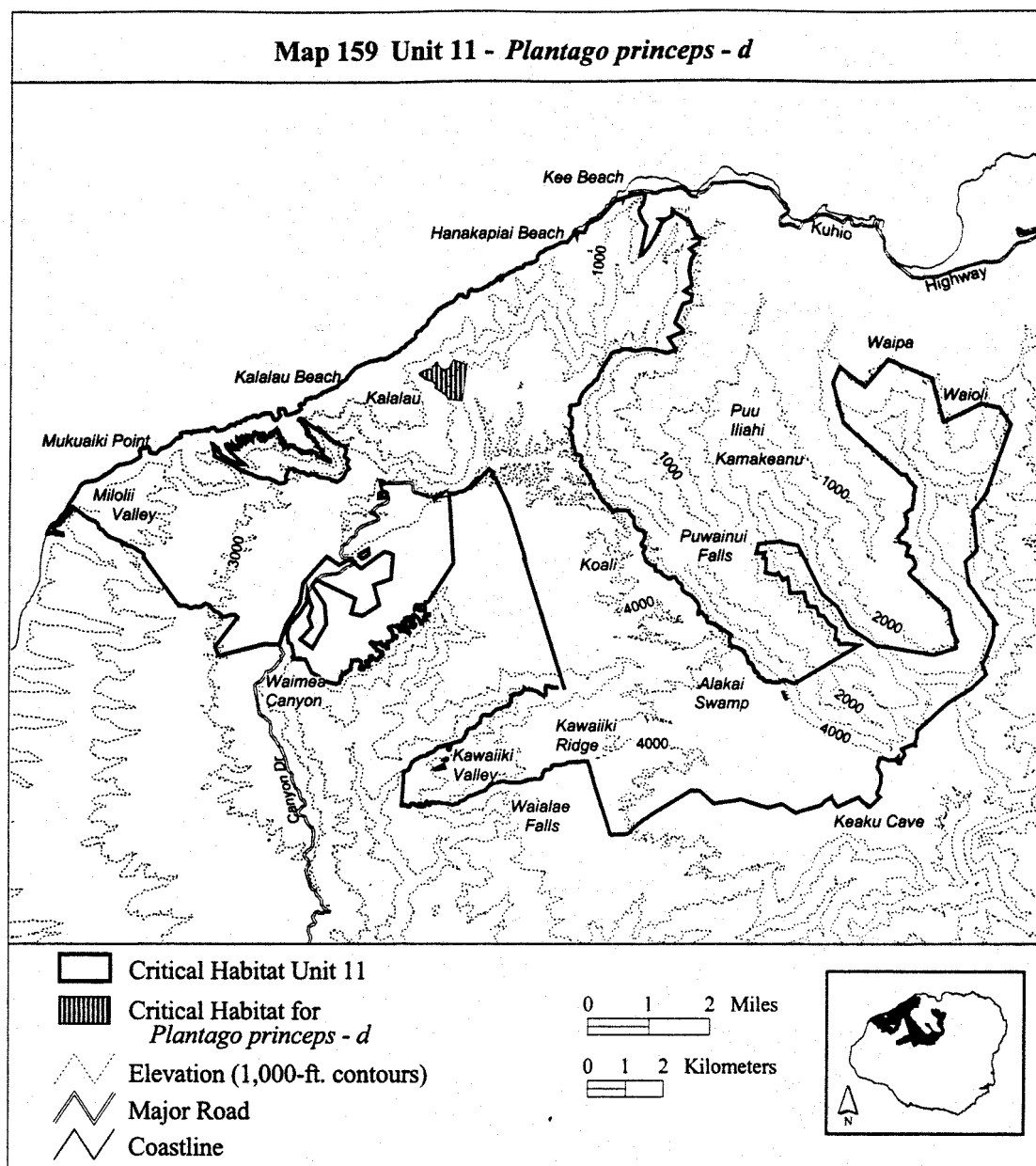
(clix) Kauai 11—*Plantago princeps*—d
(77 ha; 189 ac)

(A) Unit consists of the following 17
boundary points: Start at 434421,

2452541; 434634, 2452659; 434776,
2452663; 434894, 2452862; 434993,
2452692; 435074, 2452644; 435221,
2452678; 435334, 2452914; 435626,
2452805; 435684, 2452743; 435571,

2451808; 435202, 2451855; 435126,
2452002; 434852, 2452163; 434885,
2452271; 434757, 2452352; 434587,
2452394; return to starting point.

(B) **Note:** Map 159 follows:



(clx) Kauai 11—*Platanthera holochila*—
a (4,149 ha; 10,253 ac)

(A) Unit consists of the following 419 boundary points: Start at 443067, 2445215; 443066, 2445209; 443066, 2445190; 443083, 2445171; 443103, 2445152; 443122, 2445132; 443135, 2445115; 443140, 2445105; 443144, 2445096; 443150, 2445078; 443152, 2445059; 443153, 2445040; 443153, 2445020; 443156, 2445003; 443158, 2444995; 443163, 2444984; 443175, 2444965; 443177, 2444962; 443193, 2444946; 443196, 2444944; 443215, 2444938; 443234, 2444932; 443240, 2444927; 443252, 2444914; 443260, 2444907; 443271, 2444898; 443281, 2444890; 443290, 2444876; 443294, 2444870; 443301, 2444851; 443307,

2444833; 443309, 2444829; 443313, 2444815; 443320, 2444796; 443327, 2444778; 443333, 2444758; 443341, 2444740; 443346, 2444728; 443352, 2444721; 443366, 2444706; 443373, 2444702; 443385, 2444699; 443403, 2444695; 443423, 2444686; 443435, 2444664; 443440, 2444655; 443443, 2444647; 443444, 2444627; 443447, 2444608; 443452, 2444591; 443459, 2444579; 443464, 2444570; 443478, 2444555; 443483, 2444551; 443497, 2444548; 443516, 2444546; 443534, 2444543; 443553, 2444537; 443557, 2444532; 443571, 2444521; 443579, 2444514; 443598, 2444493; 443610, 2444483; 443617, 2444477; 443628, 2444469; 443647, 2444460; 443666, 2444456; 443677, 2444459; 443685,

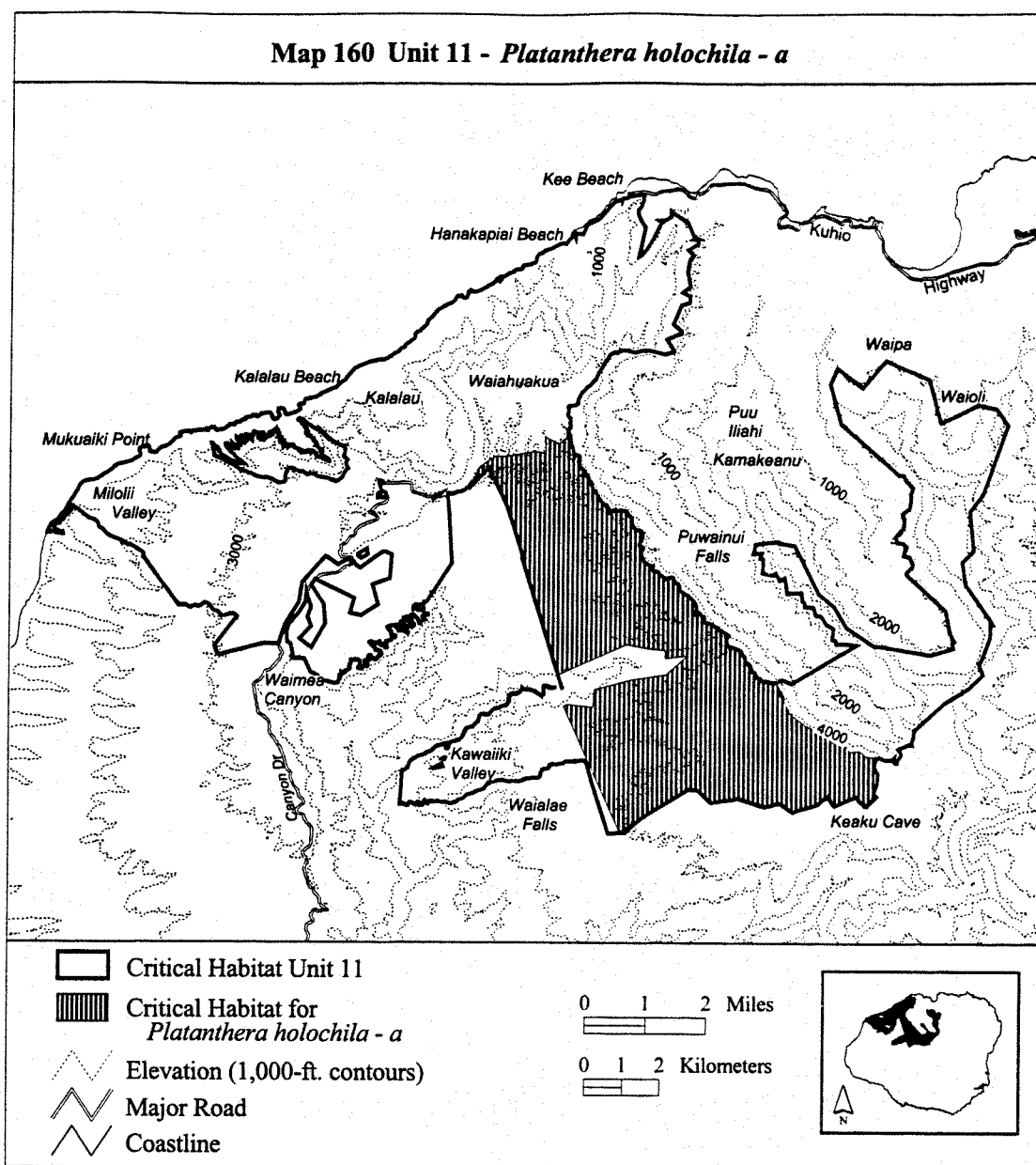
2444463; 443703, 2444469; 443722, 2444464; 443732, 2444458; 443740, 2444454; 443760, 2444446; 443769, 2444440; 443987, 2444415; 444047, 2444337; 444117, 2444107; 444210, 2443933; 444299, 2443729; 444347, 2443603; 444425, 2443555; 444600, 2443428; 444759, 2443295; 445253, 2443054; 445513, 2442838; 445854, 2442734; 445951, 2442593; 446214, 2442612; 446381, 2442489; 446652, 2442437; 446591, 2442195; 446694, 2442007; 446686, 2441764; 446640, 2441627; 446587, 2441543; 446587, 2441501; 446641, 2441436; 446560, 2441376; 446348, 2441177; 446122, 2441415; 445543, 2441183; 445413, 2441371; 445395, 2441421; 445382, 2441433; 445261, 2441357; 445124,

2441205; 444465, 2441003; 444154,
2441263; 443699, 2441176; 442976,
2441356; 442310, 2441249; 441883,
2441603; 441623, 2441574; 440236,
2440690; 440188, 2440625; 439852,
2440461; 438358, 2443756; 438446,
2443829; 439134, 2443741; 439178,
2444225; 440174, 2444473; 441068,
2444619; 441639, 2445117; 441039,
2445044; 441039, 2445264; 440672,
2445293; 440013, 2445410; 438234,
2444610; 438008, 2445343; 436790,
2449091; 436517, 2449722; 436337,
2450061; 436433, 2450077; 436359,
2450114; 435843, 2449559; 435838,
2449570; 436073, 2450082; 436483,
2450345; 436849, 2450360; 437537,
2450491; 437845, 2450462; 437816,
2450886; 438167, 2450681; 438372,
2450842; 438403, 2451013; 438416,
2451091; 438463, 2451098; 438455,
2451089; 438434, 2451069; 438425,
2451047; 438435, 2450985; 438427,
2450964; 438472, 2450910; 438501,
2450796; 438488, 2450686; 438554,
2450559; 438581, 2450423; 438621,
2450415; 438690, 2450392; 438715,
2450373; 438731, 2450342; 438736,
2450325; 438737, 2450311; 438732,
2450286; 438717, 2450241; 438713,
2450206; 438716, 2450162; 438730,
2450109; 438744, 2450081; 438765,
2450051; 438791, 2450036; 438816,
2450028; 438831, 2450010; 438850,
2449982; 438884, 2449918; 438894,
2449879; 438904, 2449863; 438919,
2449853; 438944, 2449813; 438965,
2449767; 438974, 2449738; 438999,
2449702; 439016, 2449687; 439025,
2449671; 439037, 2449642; 439044,
2449631; 439065, 2449586; 439076,
2449548; 439102, 2449480; 439114,
2449463; 439146, 2449435; 439167,
2449414; 439200, 2449362; 439220,
2449318; 439230, 2449287; 439244,
2449261; 439260, 2449242; 439277,
2449220; 439307, 2449169; 439330,
2449145; 439361, 2449126; 439382,
2449107; 439399, 2449097; 439421,
2449088; 439433, 2449078; 439437,
2449066; 439437, 2449023; 439451,
2449000; 439508, 2448984; 439516,
2448971; 439526, 2448944; 439539,

2448922; 439553, 2448909; 439578,
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2448899; 440000, 2448878; 440036,
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2448747; 440112, 2448732; 440121,
2448718; 440125, 2448690; 440124,
2448663; 440120, 2448633; 440125,
2448578; 440136, 2448537; 440157,
2448511; 440179, 2448496; 440190,
2448485; 440198, 2448467; 440218,
2448446; 440237, 2448434; 440254,
2448428; 440307, 2448418; 440331,
2448411; 440350, 2448395; 440375,
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2448314; 440415, 2448290; 440421,
2448239; 440413, 2448216; 440401,
2448191; 440384, 2448138; 440374,
2448123; 440341, 2448084; 440331,
2448061; 440325, 2448033; 440329,
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2447991; 440426, 2447974; 440435,
2447959; 440436, 2447941; 440395,
2447896; 440384, 2447871; 440378,
2447845; 440377, 2447819; 440383,
2447794; 440413, 2447711; 440451,
2447620; 440468, 2447593; 440487,
2447571; 440540, 2447539; 440579,
2447511; 440599, 2447501; 440674,
2447485; 440693, 2447475; 440703,
2447461; 440703, 2447452; 440695,
2447430; 440693, 2447407; 440699,
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2447195; 441219, 2447195; 441231,
2447186; 441240, 2447171; 441268,
2447104; 441283, 2447083; 441317,
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2446171; 442019, 2446165; 442039,
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2446146; 442073, 2446121; 442067,
2446082; 442072, 2446052; 442082,
2446029; 442100, 2446007; 442175,
2445995; 442202, 2445986; 442261,
2445949; 442273, 2445945; 442301,
2445924; 442317, 2445917; 442372,
2445885; 442381, 2445882; 442428,
2445851; 442430, 2445827; 442435,
2445813; 442444, 2445807; 442467,
2445799; 442492, 2445803; 442501,
2445803; 442711, 2445664; 442713,
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2445370; 442785, 2445364; 442798,
2445359; 442804, 2445357; 442821,
2445353; 442842, 2445347; 442858,
2445342; 442862, 2445341; 442877,
2445336; 442898, 2445330; 442915,
2445323; 442934, 2445314; 442952,
2445303; 442956, 2445301; 442972,
2445292; 442981, 2445284; 442990,
2445276; 443006, 2445268; 443009,
2445266; 443029, 2445263; 443047,
2445260; 443065, 2445247; 443068,
2445227; return to starting point.

(B) **Note:** Map 160 follows:



(clxi) Kauai 11—*Poa mannii*—a (1,871 ha; 4,624 ac)

(A) Unit consists of the following 174 boundary points: Start at 425642, 2448753; 426032, 2448753; 426313, 2448497; 426288, 2448753; 426735, 2448715; 427004, 2448702; 426723, 2448868; 426723, 2448996; 427068, 2449085; 426697, 2449175; 426288, 2449252; 426070, 2449379; 426428, 2449430; 426428, 2449545; 426697, 2449609; 427068, 2449801; 427196, 2449942; 427273, 2450069; 427708, 2449967; 427887, 2449993; 428040, 2450235; 428168, 2449878; 428232, 2449788; 428488, 2449673; 428488, 2449571; 428718, 2449443; 428910, 2449533; 429089, 2449443; 429115, 2449532; 429549, 2449584; 429805,

2449609; 429677, 2449941; 429283, 2450247; 429576, 2450092; 429717, 2449996; 429751, 2449978; 429791, 2449963; 429830, 2449956; 429860, 2449947; 429944, 2449910; 429968, 2449904; 430016, 2449884; 430068, 2449856; 430172, 2449815; 430207, 2449804; 430261, 2449795; 430317, 2449781; 430340, 2449778; 430365, 2449787; 430392, 2449798; 430408, 2449802; 430410, 2449802; 430406, 2449796; 430471, 2449787; 430527, 2449754; 430583, 2449736; 430635, 2449693; 430696, 2449656; 430720, 2449646; 430819, 2449646; 430899, 2449674; 430918, 2449717; 430904, 2449834; 430927, 2449905; 430955, 2449985; 430993, 2450032; 431068, 2450041; 431153, 2450008; 431238,

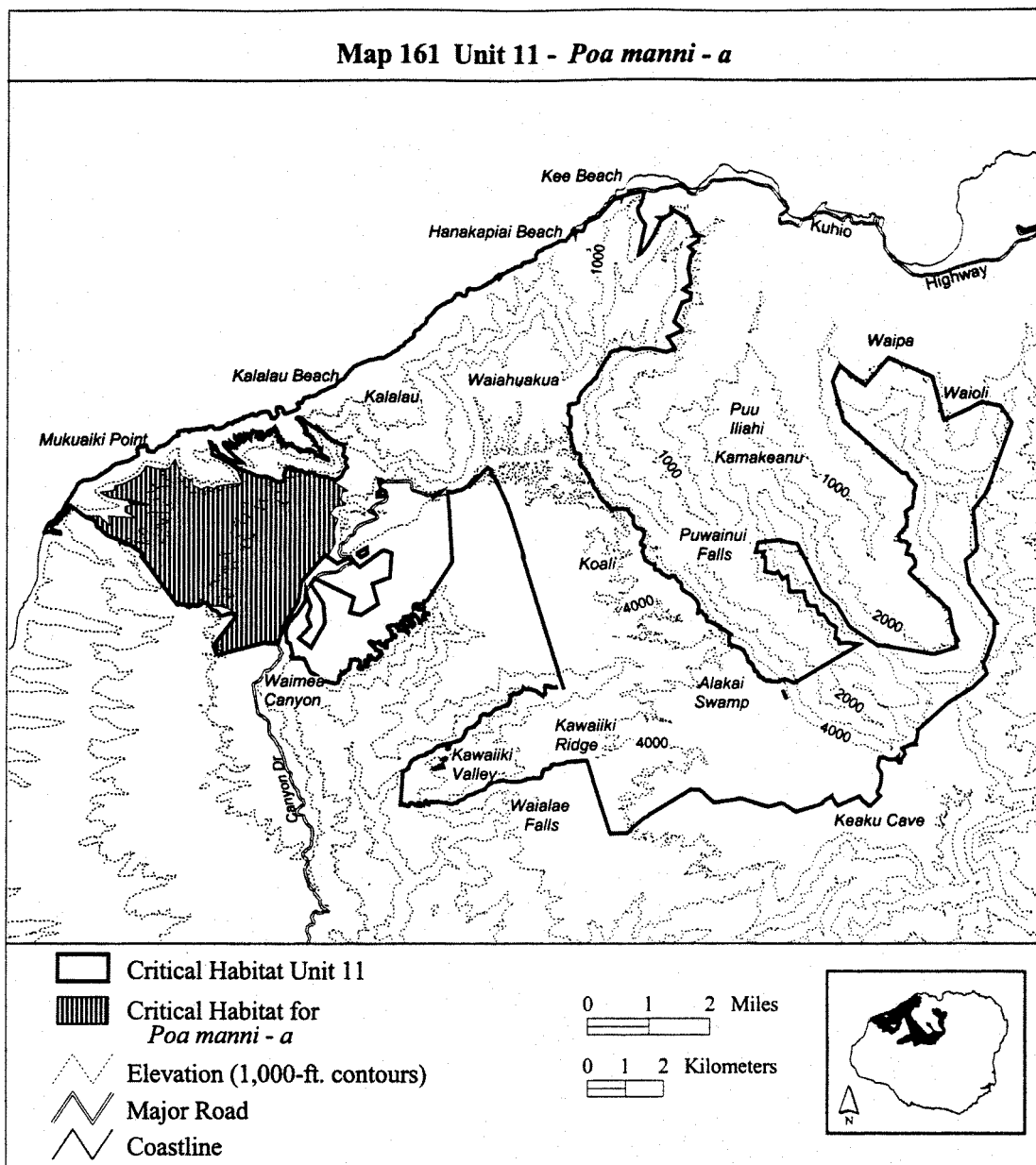
2449970; 431285, 2449942; 431360, 2449956; 431449, 2449886; 431497, 2449867; 431605, 2449895; 431657, 2449890; 431699, 2449876; 431765, 2449810; 431864, 2449801; 431981, 2449792; 431993, 2449791; 432594, 2449404; 432440, 2449378; 432415, 2449161; 432550, 2449064; 432514, 2449029; 432286, 2448988; 432120, 2448816; 432217, 2448734; 432331, 2448670; 432248, 2448433; 432235, 2448305; 432261, 2448075; 432248, 2447985; 432082, 2447678; 432073, 2447674; 432001, 2447726; 431869, 2447580; 431749, 2447525; 431686, 2447378; 431369, 2447027; 431298, 2446522; 430955, 2445963; 430837, 2445645; 430679, 2445410; 430405, 2445422; 429367, 2445154; 429077,

2445312; 429062, 2445354; 429654,
2446125; 429591, 2446167; 429485,
2446305; 429263, 2446389; 429094,
2446389; 428972, 2446421; 428904,
2446474; 428793, 2446542; 428740,
2446564; 428655, 2446474; 428602,
2446447; 428476, 2446463; 428396,
2446447; 428285, 2446458; 428116,
2446474; 428047, 2446484; 427185,
2447661; 427161, 2447669; 427157,
2447676; 427157, 2447711; 427175,
2447754; 427176, 2447775; 427171,

2447800; 427160, 2447815; 427124,
2447837; 427084, 2447847; 427039,
2447867; 426997, 2447892; 426981,
2447902; 426958, 2447923; 426944,
2447941; 426907, 2447965; 426847,
2447992; 426819, 2447998; 426798,
2448010; 426758, 2448005; 426737,
2448009; 426722, 2448015; 426613,
2448093; 426561, 2448116; 426517,
2448133; 426478, 2448151; 426432,
2448166; 426398, 2448180; 426338,
2448196; 426281, 2448222; 426223,

2448260; 426138, 2448319; 426097,
2448378; 426063, 2448412; 426051,
2448421; 426007, 2448440; 425989,
2448455; 425969, 2448492; 425954,
2448543; 425949, 2448584; 425923,
2448613; 425884, 2448631; 425855,
2448652; 425837, 2448658; 425792,
2448676; 425765, 2448685; 425735,
2448700; 425708, 2448709; 425675,
2448727; 425654, 2448744; return to
starting point.

(B) Note: Map 161 follows:



(clxii) Kauai 11—*Poa mannii*—b (677 ha; 1,673 ac)

(A) Unit consists of the following 234 boundary points: Start at 438751, 2445160; 438842, 2444944; 439024,

2445148; 439285, 2445160; 439353, 2445398; 439637, 2445466; 439933, 2445511; 440148, 2445421; 440273, 2445375; 440512, 2445375; 441091, 2445284; 441046, 2445068; 441387, 2445216; 441625, 2445204; 441750,

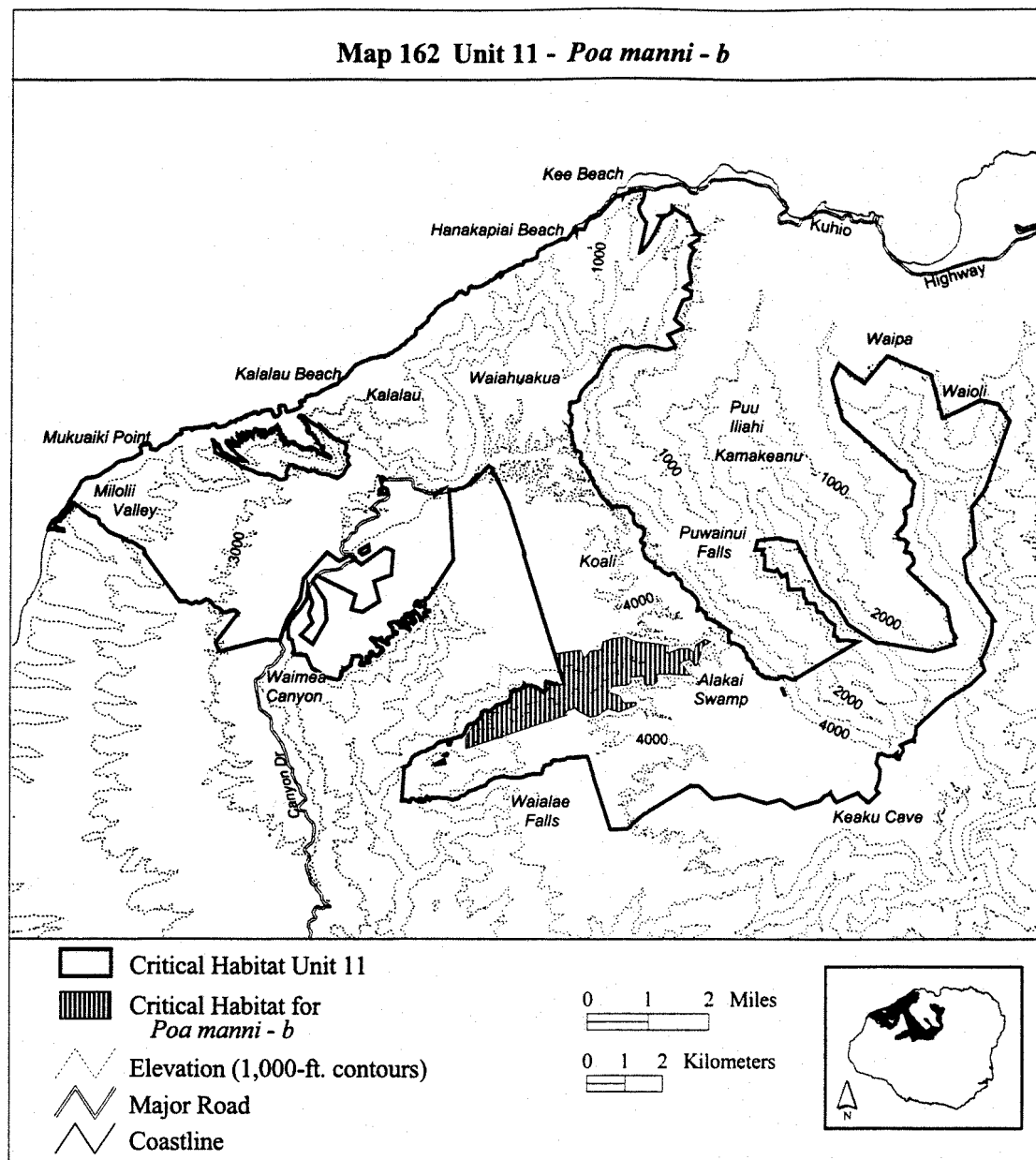
2445102; 441807, 2445307; 441909, 2445363; 442045, 2445454; 442204, 2445397; 441966, 2445250; 441943, 2445068; 441841, 2444784; 441784, 2444750; 441648, 2444921; 441409, 2444841; 441659, 2444489; 441148,

2444523; 440784, 2444523; 440796,
2444330; 440682, 2444240; 440444,
2444251; 440421, 2444478; 440216,
2444455; 440069, 2444455; 440092,
2444296; 439989, 2444240; 439603,
2444206; 439478, 2444047; 439808,
2443945; 439910, 2443763; 440239,
2443785; 440239, 2443695; 440035,
2443627; 439773, 2443513; 439467,
2443615; 439217, 2443422; 439012,
2443388; 438638, 2443581; 438638,
2443638; 438376, 2443536; 438399,
2443445; 435707, 2442537; 435707,
2442855; 435926, 2443221; 435933,
2443223; 435942, 2443232; 435949,
2443246; 435958, 2443255; 435969,
2443263; 435979, 2443271; 435993,
2443281; 436010, 2443297; 436032,
2443316; 436048, 2443332; 436064,
2443343; 436080, 2443358; 436089,
2443375; 436095, 2443390; 436100,
2443403; 436107, 2443421; 436113,
2443456; 436118, 2443477; 436123,
2443502; 436134, 2443520; 436146,
2443534; 436160, 2443543; 436175,
2443554; 436190, 2443560; 436213,
2443563; 436227, 2443563; 436240,
2443562; 436254, 2443557; 436265,
2443552; 436274, 2443547; 436287,
2443540; 436300, 2443537; 436315,
2443532; 436328, 2443529; 436337,
2443528; 436348, 2443531; 436357,
2443536; 436369, 2443546; 436380,
2443558; 436392, 2443572; 436403,
2443585; 436421, 2443611; 436438,
2443631; 436460, 2443655; 436478,

2443676; 436497, 2443688; 436518,
2443696; 436534, 2443700; 436558,
2443707; 436576, 2443711; 436597,
2443714; 436611, 2443716; 436630,
2443718; 436644, 2443720; 436655,
2443724; 436666, 2443731; 436678,
2443742; 436697, 2443756; 436708,
2443763; 436726, 2443769; 436745,
2443772; 436758, 2443775; 436771,
2443776; 436788, 2443776; 436799,
2443778; 436808, 2443781; 436818,
2443785; 436823, 2443786; 436829,
2443790; 436837, 2443797; 436841,
2443801; 436845, 2443807; 436852,
2443819; 436861, 2443831; 436870,
2443847; 436882, 2443863; 436890,
2443877; 436900, 2443900; 436911,
2443923; 436914, 2443936; 436914,
2443948; 436913, 2443962; 436910,
2443981; 436908, 2443995; 436908,
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2444055; 436942, 2444065; 436951,
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2444102; 436994, 2444107; 437009,
2444108; 437026, 2444105; 437049,
2444100; 437067, 2444092; 437076,
2444089; 437106, 2444090; 437119,
2444096; 437128, 2444104; 437133,
2444112; 437137, 2444122; 437144,
2444130; 437156, 2444135; 437169,
2444141; 437183, 2444150; 437191,
2444154; 437202, 2444165; 437212,
2444177; 437228, 2444198; 437239,
2444213; 437245, 2444227; 437254,

2444239; 437263, 2444246; 437278,
2444240; 437294, 2444234; 437310,
2444225; 437332, 2444217; 437351,
2444217; 437370, 2444223; 437391,
2444223; 437412, 2444226; 437428,
2444226; 437445, 2444223; 437462,
2444219; 437482, 2444211; 437497,
2444205; 437541, 2444190; 437563,
2444183; 437578, 2444179; 437593,
2444170; 437610, 2444160; 437624,
2444146; 437636, 2444132; 437651,
2444119; 437671, 2444112; 437691,
2444102; 437703, 2444093; 437722,
2444082; 437732, 2444069; 437749,
2444061; 437758, 2444058; 437768,
2444060; 437780, 2444066; 437810,
2444080; 437821, 2444088; 437831,
2444100; 437833, 2444111; 437835,
2444126; 437833, 2444139; 437827,
2444163; 437822, 2444185; 437820,
2444206; 437818, 2444236; 437824,
2444265; 437828, 2444292; 437836,
2444314; 437843, 2444322; 437854,
2444327; 437871, 2444328; 437887,
2444323; 437909, 2444314; 437933,
2444302; 437960, 2444289; 437984,
2444274; 438007, 2444260; 438028,
2444258; 438048, 2444258; 438072,
2444260; 438087, 2444266; 438109,
2444271; 438133, 2444273; 438164,
2444270; 438196, 2444263; 438335,
2444214; 438062, 2445062; return to
starting point.

(B) **Note:** Map 162 follows:



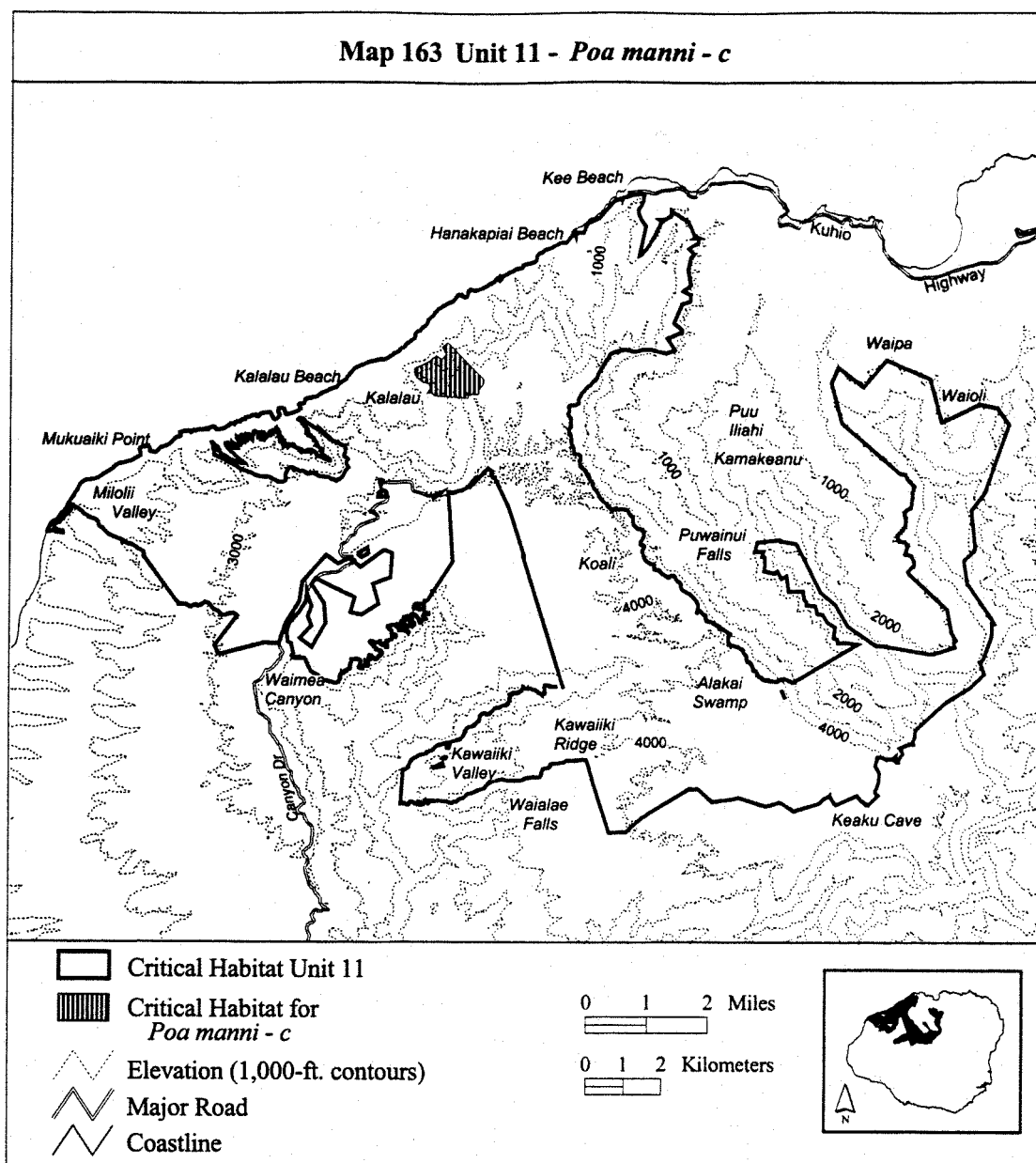
(clxiii) Kauai 11—*Poa mannii*—c (155 ha; 382 ac)

(A) Unit consists of the following 25 boundary points: Start at 435195, 2453363; 436166, 2452375; 436126, 2452230; 436044, 2452097; 436021,

2451986; 435829, 2451986; 435788, 2451934; 435672, 2452056; 435753, 2451876; 434846, 2451952; 434765, 2452045; 434660, 2452010; 434742, 2452144; 434695, 2452271; 434556, 2452306; 434463, 2452370; 434381,

2452440; 434329, 2452515; 434317, 2452661; 434474, 2452748; 434701, 2452846; 434893, 2453015; 435044, 2452916; 435155, 2453055; 435062, 2453241; return to starting point.

(B) **Note:** Map 163 follows:



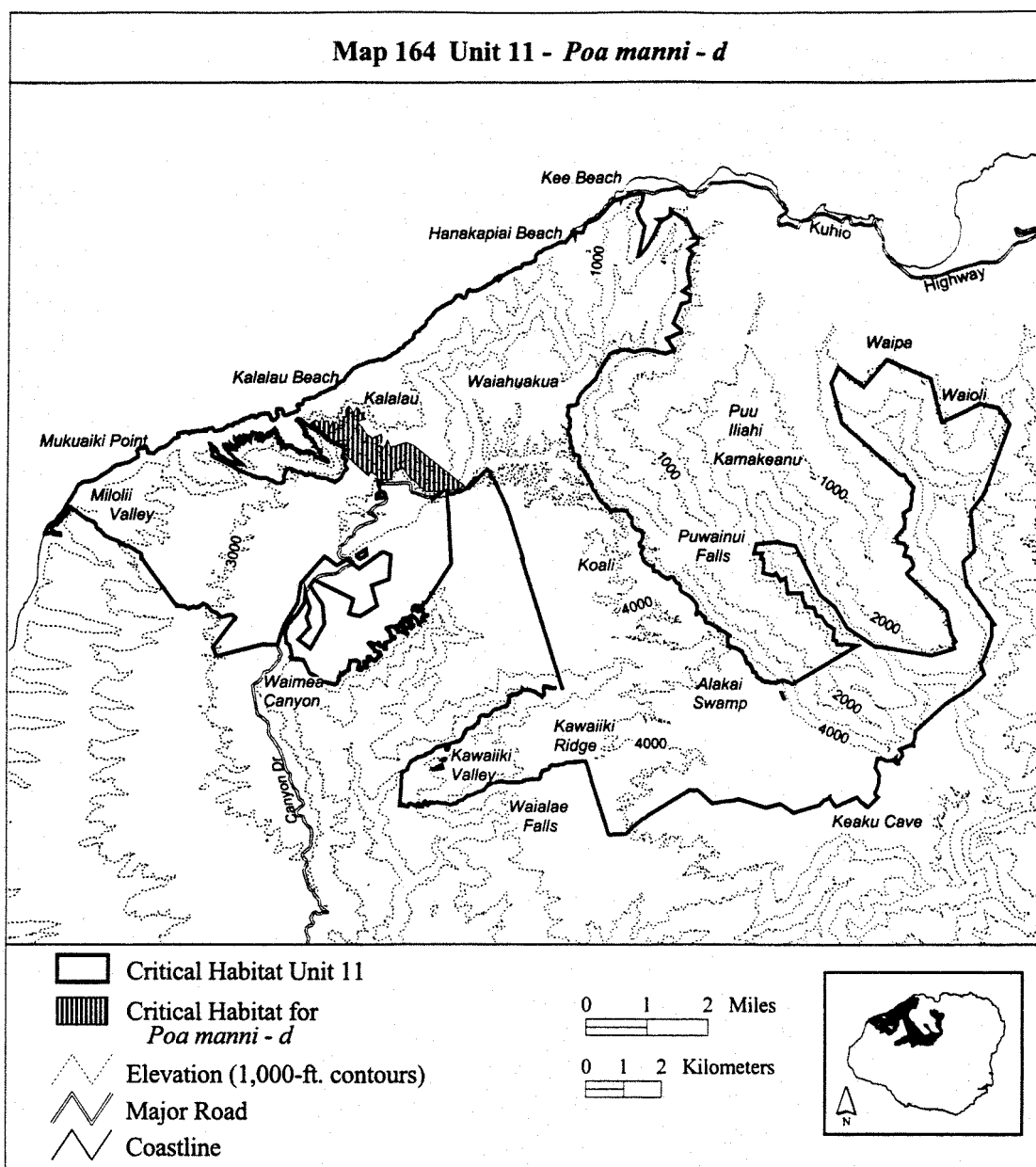
(clxiv) Kauai 11—*Poa mannii*—d (307 ha; 758 ac)

(A) Unit consists of the following 77 boundary points: Start at 433153, 2449843; 432813, 2450152; 432485, 2450450; 432490, 2450478; 432501, 2450529; 432494, 2450543; 432477, 2450580; 432468, 2450593; 432464, 2450611; 432465, 2450623; 432450, 2450624; 432408, 2450635; 432380, 2450644; 432335, 2450666; 432281, 2450696; 432235, 2450718; 432200, 2450735; 432172, 2450746; 432145, 2450759; 431625, 2451231; 431758,

2451328; 431849, 2451245; 431911, 2451384; 431960, 2451272; 432072, 2451300; 432121, 2451098; 432191, 2451293; 432246, 2451224; 432267, 2451286; 432386, 2451112; 432365, 2451307; 432477, 2451286; 432456, 2451398; 432532, 2451384; 432553, 2451481; 432539, 2451572; 432630, 2451691; 432742, 2451495; 432825, 2451642; 432909, 2451579; 432902, 2451481; 433035, 2451523; 433000, 2451405; 433063, 2451335; 432902, 2451300; 432867, 2451237; 433000, 2451098; 433084, 2450965; 433181, 2450896; 433244, 2450833; 433481,

2450937; 433516, 2450868; 433516, 2450756; 433411, 2450624; 433509, 2450638; 433509, 2450491; 433642, 2450798; 433718, 2450603; 433893, 2450638; 434102, 2450721; 434172, 2450728; 434256, 2450679; 434339, 2450672; 435693, 2449591; 435532, 2449494; 435330, 2449466; 435107, 2449452; 434681, 2449431; 434430, 2449661; 434207, 2449836; 434046, 2450073; 433795, 2449947; 433774, 2449752; 433565, 2449738; 433404, 2449759; 433321, 2449885; 433195, 2449955; return to starting point.

(B) **Note:** Map 164 follows:



(clxv) Kauai 11—*Poa sandvicensis*—a
(1,111 ha; 2,745 ac)

(A) Unit consists of the following 244 boundary points: Start at 438161, 2444755; 437857, 2445701; 437748, 2446041; 437745, 2446059; 437889, 2446251; 438216, 2446357; 438389, 2446328; 438476, 2446232; 438601, 2446290; 438649, 2446405; 438755, 2446501; 438966, 2446501; 439168, 2446386; 439294, 2446357; 439544, 2446472; 439717, 2446433; 439938, 2446424; 440169, 2446491; 440304, 2446539; 440592, 2446529; 440736, 2446616; 440823, 2446635; 440890, 2446472; 440948, 2446375; 441227, 2446173; 441179, 2446097; 441102, 2446058; 440861, 2446106; 440669, 2446145; 440438, 2446231; 440275,

2446279; 440053, 2446251; 439851, 2446174; 439774, 2446049; 439842, 2445943; 440111, 2445828; 440582, 2445702; 440890, 2445654; 441169, 2445568; 441169, 2445462; 441246, 2445185; 441265, 2445173; 441265, 2445020; 441246, 2444808; 441246, 2444654; 441188, 2444529; 440861, 2444395; 440506, 2444328; 440227, 2444251; 440034, 2444030; 439928, 2443895; 439996, 2443760; 440121, 2443607; 440073, 2443482; 439851, 2443395; 439534, 2443376; 439101, 2443414; 438774, 2443482; 438351, 2443443; 438226, 2443367; 438206, 2443261; 438264, 2443155; 438437, 2443136; 438562, 2443107; 438668, 2443001; 438659, 2442905; 438476, 2442895; 438341, 2442886; 438389, 2442780; 438697, 2442616; 438813,

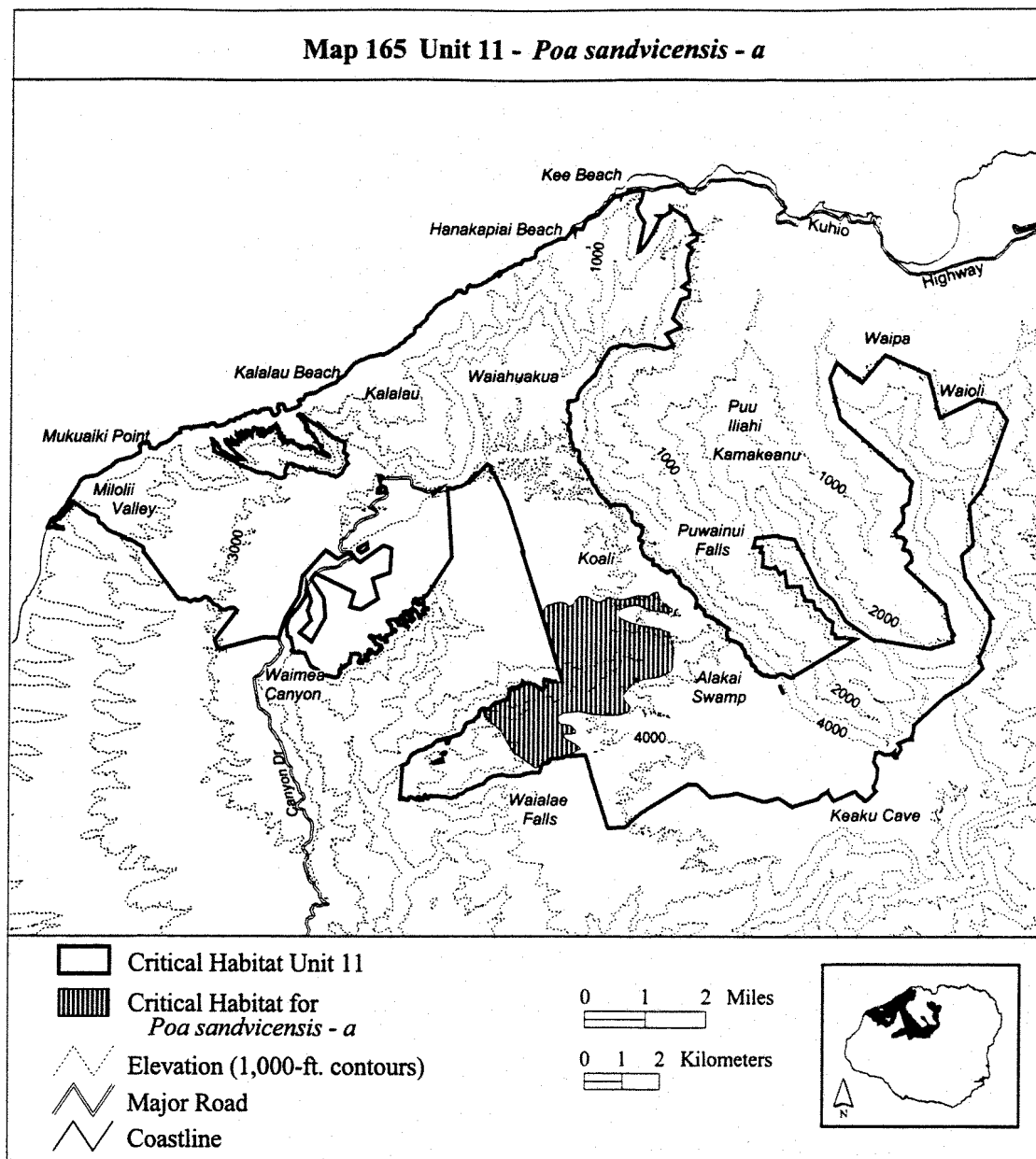
2442520; 438543, 2442357; 438226, 2442261; 438088, 2442240; 438065, 2442246; 438049, 2442246; 438030, 2442243; 438012, 2442229; 438000, 2442216; 437999, 2442211; 437937, 2442174; 437860, 2442155; 437754, 2442068; 437629, 2442001; 437283, 2442222; 437004, 2442443; 436687, 2442963; 436235, 2443367; 436198, 2443561; 436213, 2443563; 436227, 2443563; 436240, 2443562; 436254, 2443557; 436265, 2443552; 436274, 2443547; 436287, 2443540; 436300, 2443537; 436315, 2443532; 436328, 2443529; 436337, 2443528; 436348, 2443531; 436357, 2443536; 436369, 2443546; 436380, 2443558; 436392, 2443572; 436403, 2443585; 436421, 2443611; 436438, 2443631; 436460, 2443655; 436478, 2443676; 436497,

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2443756; 436708, 2443763; 436726,
2443769; 436745, 2443772; 436758,
2443775; 436771, 2443776; 436788,
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2444223; 437462, 2444219; 437482,
2444211; 437497, 2444205; 437541,
2444190; 437563, 2444183; 437578,
2444179; 437593, 2444170; 437610,
2444160; 437624, 2444146; 437636,

2444132; 437651, 2444119; 437671,
2444112; 437691, 2444102; 437703,
2444093; 437722, 2444082; 437732,
2444069; 437749, 2444061; 437758,
2444058; 437768, 2444060; 437780,
2444066; 437810, 2444080; 437821,
2444088; 437831, 2444100; 437833,
2444111; 437835, 2444126; 437833,
2444139; 437827, 2444163; 437822,
2444185; 437820, 2444206; 437818,
2444236; 437824, 2444265; 437828,
2444292; 437836, 2444314; 437843,
2444322; 437854, 2444327; 437871,
2444328; 437887, 2444323; 437909,
2444314; 437933, 2444302; 437960,
2444289; 437984, 2444274; 438007,
2444260; 438028, 2444258; 438048,
2444258; 438072, 2444260; 438087,
2444266; 438109, 2444271; 438133,
2444273; 438164, 2444270; 438196,
2444263; 438335, 2444214; return to
starting point.

(B) **Note:** Map 165 follows:



(clxvi) Kauai 11—*Poa sandvicensis*—b
(52 ha; 129 ac)

(A) Unit consists of the following 10
boundary points: Start at 436055,

2451082; 435856, 2451368; 435690,
2451778; 435398, 2452143; 435211,
2452317; 435557, 2452588; 435790,
2452218; 435961, 2452034; 436121,

2451531; 436275, 2451227; return to
starting point.

(B) **Note:** Map 166 follows:

Map 166 Unit 11 - *Poa sandvicensis* - b

Legend:

- Critical Habitat Unit 11
- Critical Habitat for *Poa sandvicensis* - b
- Elevation (1,000-ft. contours)
- Major Road
- Coastline

Scale:

- 0 1 2 Miles
- 0 1 2 Kilometers

Inset Map:

Shows the location of Unit 11 on the island of Hawaii.

(A) Unit consists of the following 227 boundary points: Start at 435318, 2449361; 435292, 2449379; 435269, 2449384; 435247, 2449385; 435234, 2449384; 435236, 2449347; 435272, 2448835; 434926, 2448514; 433562, 2447841; 433527, 2447856; 433396, 2447759; 433345, 2447734; 433014, 2447717; 433109, 2447775; 433094, 2447922; 432827, 2447751; 432878, 2447710; 432213, 2447675; 432081, 2447668; 432001, 2447726; 431942, 2447661; 431912, 2447659; 431752, 2448070; 431709, 2447946; 431586, 2447682; 431454, 2447418; 431304, 2447145; 431119, 2446952; 430635, 2447101; 430494, 2447093; 430327,

2448070; 427360, 2448281; 427360,
2448404; 427360, 2448527; 427457,
2448571; 427800, 2448633; 427967,
2448650; 427932, 2448712; 428030,
2448765; 428135, 2448800; 428126,
2448862; 428038, 2448932; 428038,
2448985; 428205, 2449073; 428363,
2449038; 428399, 2449011; 428504,
2448958; 428592, 2448967; 428601,
2448932; 428645, 2448932; 428733,
2449046; 428821, 2449073; 428989,
2449055; 429112, 2449117; 429182,
2449169; 429323, 2449161; 429350,
2449178; 429314, 2449284; 429350,
2449310; 429675, 2449345; 429790,
2449398; 429878, 2449425; 430080,
2449345; 430212, 2449328; 430354,
2449452; 430355, 2449451; 430369,
2449433; 430418, 2449395; 430437.

2449371; 430430, 2449364; 430451, 2449363; 430463, 2449355; 430474, 2449342; 430485, 2449333; 430527, 2449321; 430533, 2449310; 430545, 2449277; 430559, 2449254; 430604, 2449229; 430616, 2449214; 430623, 2449194; 430623, 2449173; 430616, 2449156; 430619, 2449138; 430629, 2449119; 430643, 2449106; 430677, 2449084; 430699, 2449074; 430717, 2449071; 430748, 2449070; 430773, 2449073; 430799, 2449081; 430825, 2449080; 430875, 2449032; 430881, 2449027; 430905, 2449022; 430921, 2449029; 430944, 2449045; 430958, 2449061; 430967, 2449077; 430984, 2449094; 431006, 2449097; 431020, 2449089; 431028, 2449064; 431024, 2449005; 431035, 2448975; 431050, 2448960; 431066, 2448956; 431086, 2448957; 431093, 2448962; 431116, 2448991; 431124, 2448994; 431134, 2448988; 431138, 2448981; 431147, 2448955; 431158, 2448950; 431170, 2448954; 431195, 2448966; 431208, 2448969; 431223, 2448964; 431228, 2448960; 431275, 2448914; 431290, 2448911; 431310, 2448912; 431339, 2448927; 431358, 2448923; 431376,

2448914; 431407, 2448903; 431463, 2448902; 431473, 2448899; 431479, 2448891; 431501, 2448872; 431538, 2448867; 431545, 2448867; 431567, 2448859; 431580, 2448844; 431596, 2448824; 431611, 2448789; 431609, 2448764; 431601, 2448750; 431600, 2448733; 431627, 2448682; 431636, 2448653; 431677, 2448576; 431702, 2448563; 431763, 2448526; 431788, 2448486; 431824, 2448430; 431830, 2448417; 431840, 2448395; 431847, 2448368; 432630, 2449144; 432749, 2449800; 433222, 2450264; 433345, 2450115; 433481, 2450031; 433526, 2449921; 433637, 2449927; 433624, 2450096; 434143, 2450303; 434279, 2450225; 434207, 2450160; 434331, 2450037; 434460, 2449992; 434590, 2449927; 434558, 2449797; 434635, 2449823; 434713, 2449765; 434707, 2449674; 434772, 2449609; 434849, 2449694; 435011, 2449713; 435148, 2449616; 435414, 2449661; 435666, 2449525; 435669, 2449472; 435664, 2449469; 435598, 2449429; 435576, 2449421; 435549, 2449426; 435517, 2449423; 435501, 2449420; 435469, 2449405; 435418, 2449387; 435390,

2449374; 435390, 2449374; 435368, 2449361; 435334, 2449356; 435319, 2449360; return to starting point.

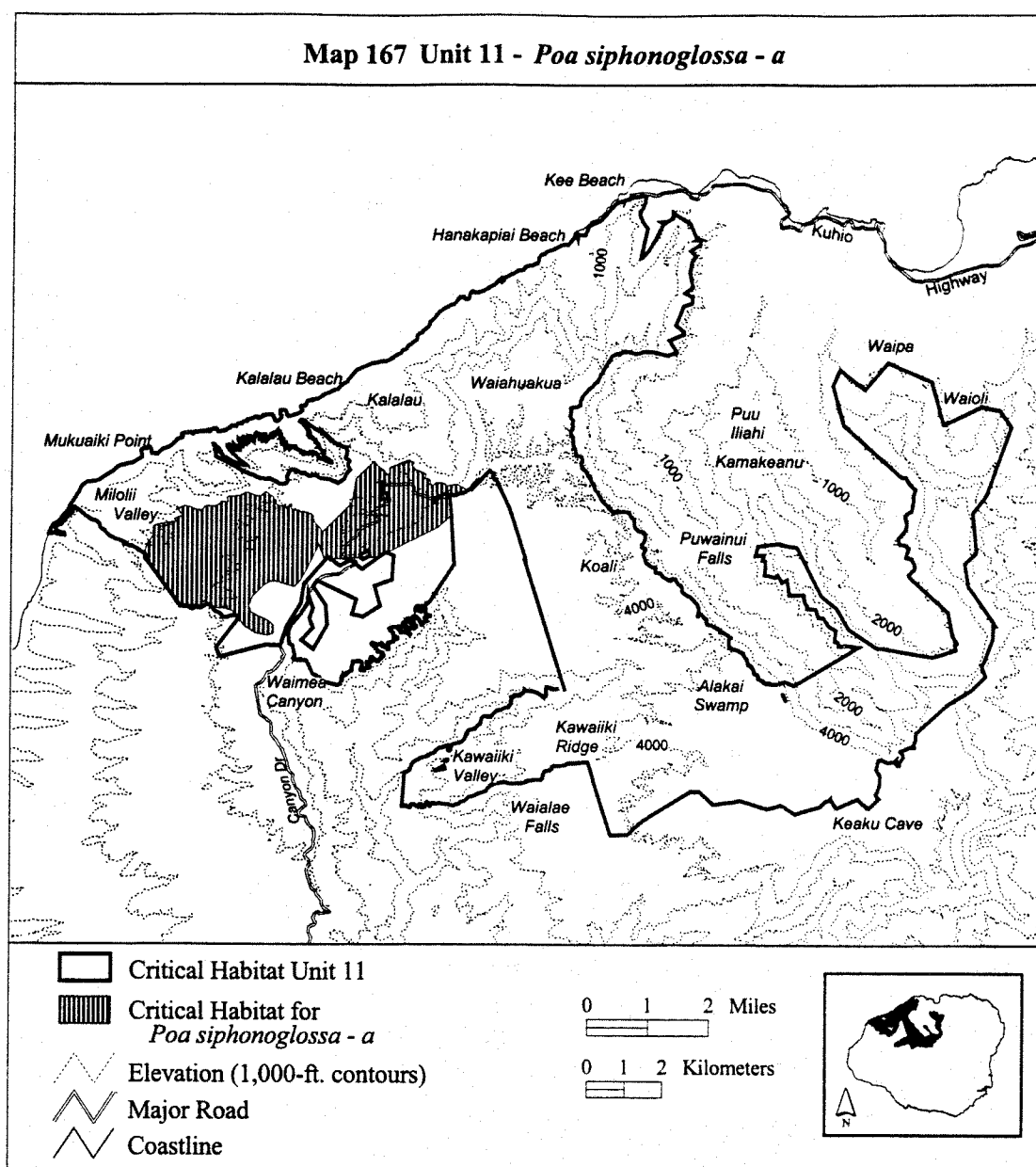
(B) Excluding 3 areas:

(1) Bounded by the following 10 points (3 ha, 8 ac): Start at 433368, 2449292; 433367, 2449352; 433448, 2449426; 433546, 2449412; 433567, 2449398; 433589, 2449323; 433612, 2449262; 433588, 2449244; 433567, 2449260; 433369, 2449255; return to starting point; and

(2) Bounded by the following 9 points (1 ha, 2 ac): Start at 433484, 2449703; 433480, 2449629; 433457, 2449622; 433440, 2449604; 433426, 2449556; 433419, 2449599; 433399, 2449709; 433436, 2449707; 433460, 2449707; return to starting point; and

(3) Bounded by the following 11 points (1 ha, 1 ac): Start at 434908, 2449290; 434890, 2449251; 434848, 2449239; 434839, 2449258; 434834, 2449277; 434833, 2449281; 434881, 2449297; 435011, 2449352; 435005, 2449310; 434948, 2449300; 434908, 2449290; return to starting point.

(C) **Note:** Map 167 follows:



(clxviii) Kauai 11—*Poa siphonoglossa*—
b (2,190 ha; 5,411 ac)

(A) Unit consists of the following 372
boundary points: Start at 439906,

2445836; 441198, 2445593; 441314,
2445048; 441237, 2444601; 441237,
2444504; 441186, 2444474; 441100,
2444115; 441081, 2443396; 441256,
2442501; 441334, 2441762; 440770,
2441101; 440528, 2440844; 440464,
2440832; 440113, 2440527; 440014,
2440441; 440002, 2440430; 439931,
2440426; 439832, 2440430; 439556,
2440414; 439491, 2440617; 439088,
2441871; 438934, 2442351; 438866,
2442347; 438838, 2442340; 438821,
2442339; 438757, 2442331; 438721,
2442329; 438704, 2442326; 438694,
2442327; 438679, 2442324; 438656,

2442321; 438626, 2442315; 438609,
2442314; 438561, 2442316; 438536,
2442314; 438535, 2442314; 438523,
2442310; 438517, 2442310; 438496,
2442310; 438460, 2442320; 438453,
2442321; 438436, 2442321; 438433,
2442319; 438418, 2442311; 438392,
2442294; 438376, 2442278; 438373,
2442277; 438355, 2442265; 438305,
2442256; 438254, 2442248; 438238,
2442248; 438219, 2442244; 438157,
2442234; 438130, 2442234; 438114,
2442232; 438098, 2442237; 438095,
2442238; 438065, 2442246; 438049,
2442246; 438030, 2442243; 438012,
2442229; 438000, 2442216; 437998,
2442205; 437998, 2442202; 437996,
2442188; 437984, 2442167; 437973,
2442147; 437954, 2442136; 437939,

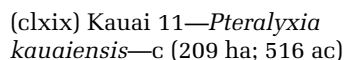
2442128; 437926, 2442125; 437912,
2442123; 437873, 2442121; 437839,
2442110; 437826, 2442106; 437806,
2442092; 437799, 2442084; 437791,
2442074; 437777, 2442052; 437766,
2442017; 437758, 2441998; 437754,
2441991; 437751, 2441981; 437745,
2441950; 437740, 2441938; 437736,
2441928; 437717, 2441899; 437711,
2441887; 437705, 2441878; 437689,
2441877; 437674, 2441875; 437647,
2441866; 437635, 2441866; 437617,
2441866; 437602, 2441867; 437566,
2441876; 437532, 2441880; 437522,
2441879; 437495, 2441869; 437460,
2441862; 437432, 2441860; 437391,
2441858; 437366, 2441852; 437346,
2441845; 437332, 2441842; 437317,
2441835; 437287, 2441816; 437274,

2441809; 437240, 2441796; 437224,
2441791; 437181, 2441781; 437150,
2441777; 437111, 2441777; 437096,
2441779; 437062, 2441776; 437008,
2441775; 436960, 2441776; 436912,
2441780; 436895, 2441784; 436825,
2441795; 436815, 2441798; 436852,
2441813; 436924, 2441863; 436993,
2441942; 437047, 2442023; 437118,
2442056; 437171, 2442113; 437171,
2442160; 437157, 2442174; 437141,
2442230; 437152, 2442320; 437149,
2442340; 436951, 2442456; 436868,
2442470; 436852, 2442472; 436744,
2442467; 436670, 2442497; 436670,
2442552; 436772, 2442671; 436792,
2442676; 436802, 2442716; 436797,
2442862; 436782, 2442872; 436607,
2443105; 436238, 2443377; 436257,
2443513; 436291, 2443539; 436300,
2443537; 436315, 2443532; 436328,
2443529; 436337, 2443528; 436348,
2443531; 436357, 2443536; 436369,
2443546; 436380, 2443558; 436392,
2443572; 436403, 2443585; 436421,
2443611; 436438, 2443631; 436460,
2443655; 436478, 2443676; 436497,
2443688; 436518, 2443696; 436534,
2443700; 436558, 2443707; 436576,
2443711; 436597, 2443714; 436611,
2443716; 436630, 2443718; 436644,
2443720; 436655, 2443724; 436666,
2443731; 436678, 2443742; 436697,
2443756; 436708, 2443763; 436726,
2443769; 436745, 2443772; 436758,
2443775; 436768, 2443775; 436771,
2443776; 436788, 2443776; 436799,
2443778; 436808, 2443781; 436818,
2443785; 436823, 2443786; 436829,
2443790; 436837, 2443797; 436841,
2443801; 436845, 2443807; 436852,
2443819; 436861, 2443831; 436870,
2443847; 436882, 2443863; 436890,
2443877; 436900, 2443900; 436911,
2443923; 436914, 2443936; 436914,

2443948; 436913, 2443962; 436910,
2443981; 436908, 2443995; 436908,
2444013; 436908, 2444013; 436911,
2444027; 436918, 2444040; 436926,
2444047; 436933, 2444055; 436942,
2444065; 436943, 2444066; 436951,
2444073; 436961, 2444084; 436969,
2444094; 436975, 2444098; 436983,
2444102; 436994, 2444107; 437009,
2444108; 437026, 2444105; 437049,
2444100; 437067, 2444092; 437076,
2444089; 437106, 2444090; 437119,
2444096; 437128, 2444104; 437133,
2444112; 437137, 2444122; 437144,
2444130; 437156, 2444135; 437169,
2444141; 437183, 2444150; 437191,
2444154; 437202, 2444165; 437212,
2444177; 437228, 2444198; 437239,
2444213; 437239, 2444213; 437245,
2444227; 437254, 2444239; 437263,
2444246; 437278, 2444240; 437294,
2444234; 437310, 2444225; 437332,
2444217; 437351, 2444217; 437370,
2444223; 437391, 2444223; 437412,
2444226; 437428, 2444226; 437445,
2444223; 437462, 2444219; 437482,
2444211; 437497, 2444205; 437541,
2444190; 437563, 2444183; 437578,
2444179; 437592, 2444171; 437593,
2444170; 437610, 2444160; 437624,
2444146; 437636, 2444132; 437651,
2444119; 437671, 2444112; 437691,
2444102; 437703, 2444093; 437722,
2444082; 437732, 2444069; 437749,
2444061; 437758, 2444058; 437768,
2444060; 437780, 2444066; 437810,
2444080; 437821, 2444088; 437831,
2444100; 437833, 2444111; 437835,
2444126; 437833, 2444139; 437827,
2444163; 437822, 2444185; 437820,
2444206; 437819, 2444215; 437818,
2444236; 437824, 2444265; 437828,
2444292; 437836, 2444314; 437843,
2444322; 437854, 2444327; 437871,
2444328; 437887, 2444323; 437909,

2444314; 437933, 2444302; 437960,
2444289; 437963, 2444287; 437984,
2444274; 438007, 2444260; 438028,
2444258; 438048, 2444258; 438072,
2444260; 438087, 2444266; 438109,
2444271; 438133, 2444273; 438164,
2444270; 438196, 2444263; 438335,
2444214; 438318, 2444268; 438317,
2444269; 438316, 2444271; 438316,
2444271; 438316, 2444271; 437232,
2447645; 437248, 2447657; 437230,
2447713; 437833, 2447791; 438864,
2447868; 438891, 2447799; 438900,
2447794; 438924, 2447717; 438940,
2447677; 439038, 2447573; 439215,
2447563; 439278, 2447580; 439290,
2447559; 439330, 2447557; 439285,
2447522; 439249, 2447443; 439141,
2447346; 439178, 2447298; 439205,
2447282; 439258, 2447293; 439325,
2447367; 439345, 2447472; 439510,
2447528; 439527, 2447477; 439609,
2447524; 439777, 2447545; 439837,
2447502; 439853, 2447479; 439856,
2447479; 439797, 2447304; 439773,
2447296; 439791, 2447275; 439776,
2447216; 439557, 2447183; 439528,
2447125; 439795, 2447081; 439817,
2447082; 439817, 2447077; 439856,
2447071; 439910, 2447092; 439910,
2447123; 440014, 2447134; 440072,
2447154; 440108, 2447168; 440110,
2447167; 440144, 2447179; 440141,
2447143; 440146, 2447140; 440234,
2447108; 440263, 2447052; 440170,
2447045; 440174, 2446941; 440148,
2446878; 440115, 2446879; 440108,
2446857; 439975, 2446650; 439979,
2446414; 440303, 2446507; 440653,
2446507; 440848, 2446623; 441003,
2446351; 441217, 2446195; 441178,
2446059; 439894, 2446138; 439903,
2446071; 439927, 2445971; return to
starting point.

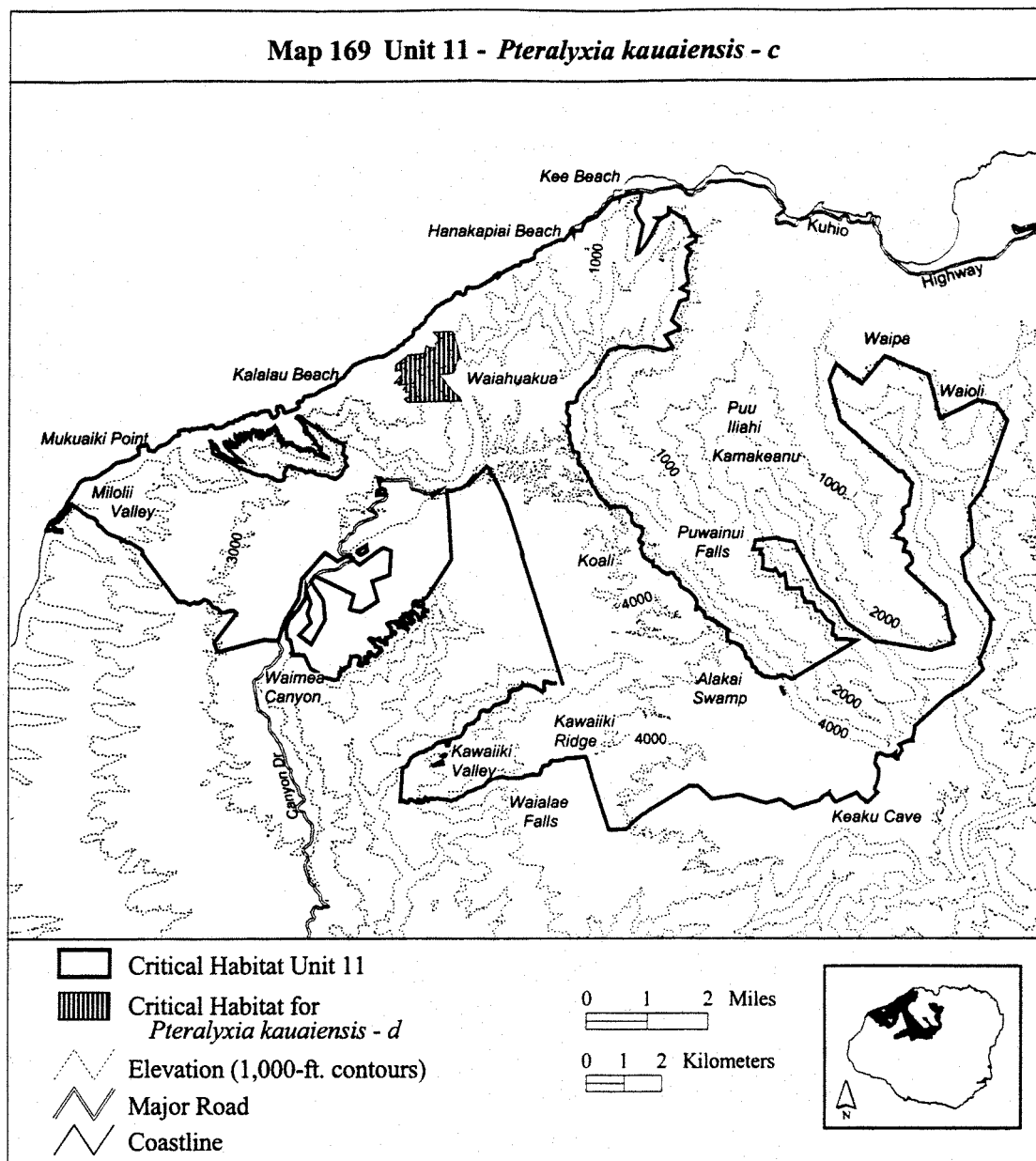
(B) **Note:** Map 168 follows:



2452126; 435419, 2451974; 435551,
2451852; 435592, 2451741; 434183,
2451701; 434102, 2451792; 434264,
2451873; 434213, 2451893; 434254,
2451984; 434112, 2451984; 434163,
2452065; 434051, 2452045; 434173,
2452187; 433940, 2452157; 433940,
2452248; 433828, 2452207; 433940,
2452339; 434041, 2452481; 433960,
2452582; 433838, 2452531; 433858,

2452693; 434051, 2452845; 434193,
2452966; 434517, 2452997; 434629,
2453017; 434669, 2453219; 434781,
2453169; 434933, 2453169; 434912,
2453280; 434983, 2453320; 434994,
2453452; 434872, 2453584; 435186,
2453594; 435379, 2453594; return to
starting point.

(B) **Note:** Map 169 follows:



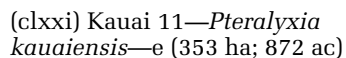
(clxx) Kauai 11—*Pteralyxia kauaiensis*—d (57 ha; 141 ac)

(A) Unit consists of the following 15 boundary points: Start at 427428,

2447329; 429224, 2446536; 429347, 2446394; 428978, 2446451; 428955, 2446435; 428904, 2446474; 428793, 2446542; 428740, 2446564; 428655, 2446474; 428602, 2446447; 428476,

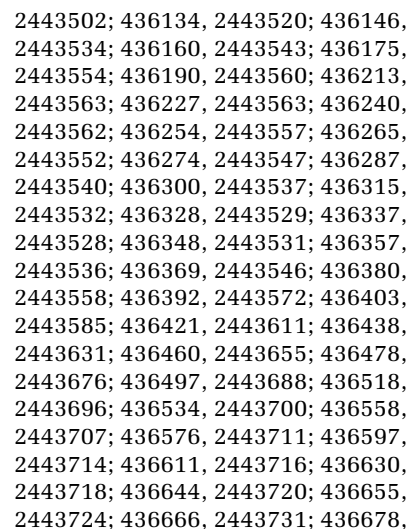
2446463; 428396, 2446447; 428285, 2446458; 428116, 2446474; 428047, 2446484; return to starting point.

(B) **Note:** Map 170 follows:



2450040; 435642, 2449908; 435642,
2449766; 435531, 2449706; 435389,
2449645; 435156, 2449635; 435105,
2449625; 435024, 2449716; 434913,
2449685; 434771, 2449635; 434659,
2449716; 434507, 2449817; 434355,
2449969; 434213, 2450182; 434274,
2450222; 434142, 2450324; 434031,
2450172; 433737, 2450162; 433676.

(B) **Note:** Map 171 follows:



2443742; 436697, 2443756; 436708, 2443763; 436726, 2443769; 436745, 2443772; 436758, 2443775; 436771, 2443776; 436788, 2443776; 436799, 2443778; 436808, 2443781; 436818, 2443785; 436823, 2443786; 436829, 2443790; 436837, 2443797; 436841, 2443801; 436845, 2443807; 436852, 2443819; 436861, 2443831; 436870, 2443847; 436882, 2443863; 436890, 2443877; 436900, 2443900; 436911, 2443923; 436914, 2443936; 436914, 2443948; 436913, 2443962; 436910, 2443981; 436908, 2443995; 436908, 2444013; 436911, 2444027; 436918, 2444040; 436926, 2444047; 436933, 2444055; 436942, 2444065; 436951, 2444073; 436961, 2444084; 436969, 2444094; 436975, 2444098; 436983, 2444102; 436994, 2444107; 437009, 2444108; 437026, 2444105; 437049, 2444100; 437067, 2444092; 437076, 2444089; 437106, 2444090; 437119, 2444096; 437128, 2444104; 437133, 2444112; 437137, 2444122; 437144, 2444130; 437156, 2444135; 437169, 2444141; 437183, 2444150; 437191, 2444154; 437202, 2444165; 437212, 2444177; 437228, 2444198; 437239, 2444213; 437245, 2444227; 437254, 2444239; 437263, 2444246; 437278, 2444240; 437294, 2444234; 437310, 2444225; 437332, 2444217; 437351, 2444217; 437370, 2444223; 437391, 2444223; 437412, 2444226; 437428, 2444226; 437445, 2444223; 437462, 2444219; 437482, 2444211; 437497, 2444205; 437541, 2444190; 437563, 2444183; 437578, 2444179; 437593, 2444170; 437610, 2444160; 437624, 2444146; 437636, 2444132; 437651, 2444119; 437671, 2444112; 437691, 2444102; 437703, 2444093; 437722, 2444082; 437732, 2444069; 437749, 2444061; 437758, 2444058; 437768, 2444060; 437780, 2444066; 437810, 2444080; 437821, 2444088; 437831, 2444100; 437833, 2444111; 437835, 2444126; 437833, 2444139; 437827, 2444163; 437822, 2444185; 437820, 2444206; 437818, 2444236; 437824, 2444265; 437828, 2444292; 437836, 2444314; 437843, 2444322; 437854, 2444327; 437871, 2444328; 437887, 2444323; 437909, 2444314; 437933, 2444302; 437960, 2444289; 437984, 2444274; 438007, 2444260; 438028, 2444258; 438048, 2444258; 438072, 2444260; 438087, 2444266; 438109, 2444271; 438133, 2444273; 438164, 2444270; 438196, 2444263; 438335, 2444214; 438209, 2444606; 438245, 2444618; 438333, 2444697; 438525, 2444758; 438578, 2444688; 438683,

2444618; 438780, 2444627; 438885, 2444574; 438946, 2444478; 438990, 2444644; 439218, 2444741; 439455, 2444846; 439639, 2444846; 439700, 2445074; 440094, 2445038; 440454, 2444793; 440243, 2444784; 440183, 2444848; 440016, 2444942; 439849, 2444916; 439919, 2444749; 439753, 2444513; 439490, 2444373; 439314, 2444215; 439139, 2444101; 439060, 2444127; 438999, 2443970; 438806, 2444022; 438648, 2444101; 438595, 2444128; 438499, 2443952; 438315, 2443882; 438315, 2443821; 438070, 2443733; 438017, 2443874; 437815, 2443821; 437579, 2443786; 437386, 2443742; 437482, 2443567; 437263, 2443506; 437254, 2443400; 437342, 2443339; 437193, 2443278; 437070, 2443278; 436939, 2443295; 436667, 2443252; 436667, 2443155; 436632, 2443068; 436702, 2442980; 436474, 2442822; 436614, 2442840; 436816, 2442857; 436798, 2442752; 436939, 2442682; 437061, 2442734; 437140, 2442620; 436947, 2442480; 437053, 2442305; 437132, 2442174; 437281, 2442174; 437289, 2442068; 437070, 2442033; 437061, 2441893; 436772, 2441937; 436755, 2442033; 436667, 2441955; 436606, 2441998; 436457, 2441981; 436413, 2441902; 436246, 2441893; 436097, 2441972; 435878, 2441884; 435939, 2441735; 435817, 2441639; 435703, 2441622; 435703, 2441455; 435343, 2441455; 435291, 2441324; 435124, 2441245; 435166, 2441229; 435127, 2441232; 435053, 2441251; 435010, 2441263; 434950, 2441241; 434901, 2441226; 434881, 2441230; 434867, 2441252; 434859, 2441262; 434851, 2441266; 434843, 2441266; 434811, 2441263; 434806, 2441260; 434794, 2441245; 434787, 2441223; 434779, 2441196; 434754, 2441166; 434742, 2441170; 434733, 2441191; 434717, 2441232; 434699, 2441277; 434696, 2441283; 434689, 2441286; 434676, 2441286; 434669, 2441281; 434661, 2441273; 434653, 2441254; 434641, 2441213; 434631, 2441186; 434629, 2441175; 434626, 2441167; 434615, 2441161; 434592, 2441168; 434580, 2441170; 434570, 2441168; 434563, 2441163; 434556, 2441145; 434551, 2441140; 434542, 2441137; 434538, 2441144; 434535, 2441154; 434536, 2441173; 434530, 2441201; 434523, 2441222; 434520, 2441227; 434516, 2441230; 434508, 2441229; 434501, 2441223; 434489, 2441216; 434475, 2441203; 434448, 2441190; 434424, 2441176; 434397, 2441178; 434359, 2441197; 434333,

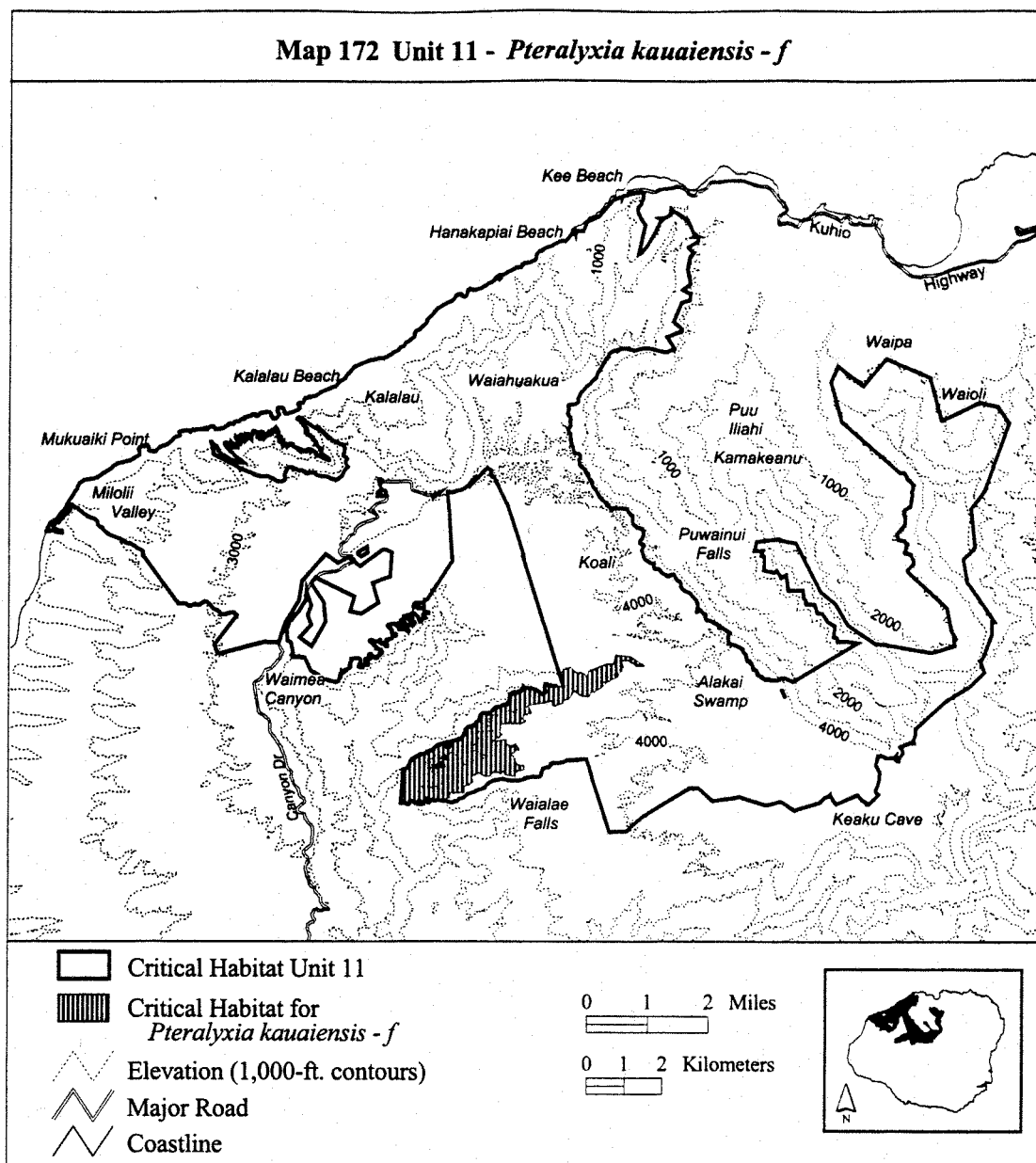
2441217; 434325, 2441222; 434308, 2441229; 434293, 2441229; 434280, 2441225; 434259, 2441212; 434253, 2441203; 434240, 2441177; 434228, 2441152; 434223, 2441147; 434216, 2441143; 434190, 2441144; 434174, 2441147; 434155, 2441156; 434145, 2441157; 434130, 2441163; 434110, 2441175; 434097, 2441181; 434079, 2441193; 434069, 2441192; 434062, 2441188; 434026, 2441177; 434018, 2441178; 434073, 2442051; 434078, 2442055; 434086, 2442062; 434103, 2442070; 434112, 2442076; 434126, 2442080; 434139, 2442083; 434144, 2442086; 434153, 2442092; 434175, 2442105; 434192, 2442116; 434203, 2442127; 434215, 2442141; 434220, 2442151; 434229, 2442173; 434247, 2442208; 434253, 2442234; 434261, 2442257; 434269, 2442282; 434282, 2442299; 434295, 2442316; 434308, 2442329; 434330, 2442350; 434344, 2442361; 434355, 2442368; 434370, 2442378; 434395, 2442387; 434416, 2442397; 434439, 2442410; 434458, 2442423; 434486, 2442437; 434504, 2442450; 434522, 2442454; 434537, 2442457; 434563, 2442460; 434590, 2442462; 434610, 2442464; 434628, 2442472; 434643, 2442483; 434664, 2442490; 434680, 2442493; 434700, 2442502; 434713, 2442515; 434725, 2442524; 434735, 2442532; 434755, 2442542; 434775, 2442551; 434800, 2442556; 434822, 2442562; 434842, 2442574; 434862, 2442596; 434883, 2442613; 434896, 2442626; 434916, 2442647; 434934, 2442668; 434949, 2442681; 434972, 2442699; 434986, 2442705; 434997, 2442708; 435006, 2442713; 435012, 2442717; 435026, 2442719; 435039, 2442722; 435061, 2442727; 435081, 2442733; 435100, 2442739; 435119, 2442747; 435135, 2442754; 435150, 2442764; 435164, 2442771; 435184, 2442774; 435201, 2442777; 435219, 2442778; 435237, 2442782; 435251, 2442783; 435228, 2442762; 435237, 2442643; 435284, 2442631; return to starting point.

(B) Excluding 2 areas:

(1) Bounded by the following 3 points (1 ha; 3 ac): Start at 435132, 2442248; 435160, 2442164; 434848, 2442098; return to starting point; and

(2) Bounded by the following 4 points (0 ha; 1 ac): Start at 435151, 2442425; 435215, 2442393; 435195, 2442353; 435128, 2442379; return to starting point.

(C) **Note:** Map 172 follows:



(clxxiii) Kauai 11—*Pteralyxia kauaiensis*—g (445 ha; 1,100 ac)

(A) Unit consists of the following 136 boundary points: Start at 426830,

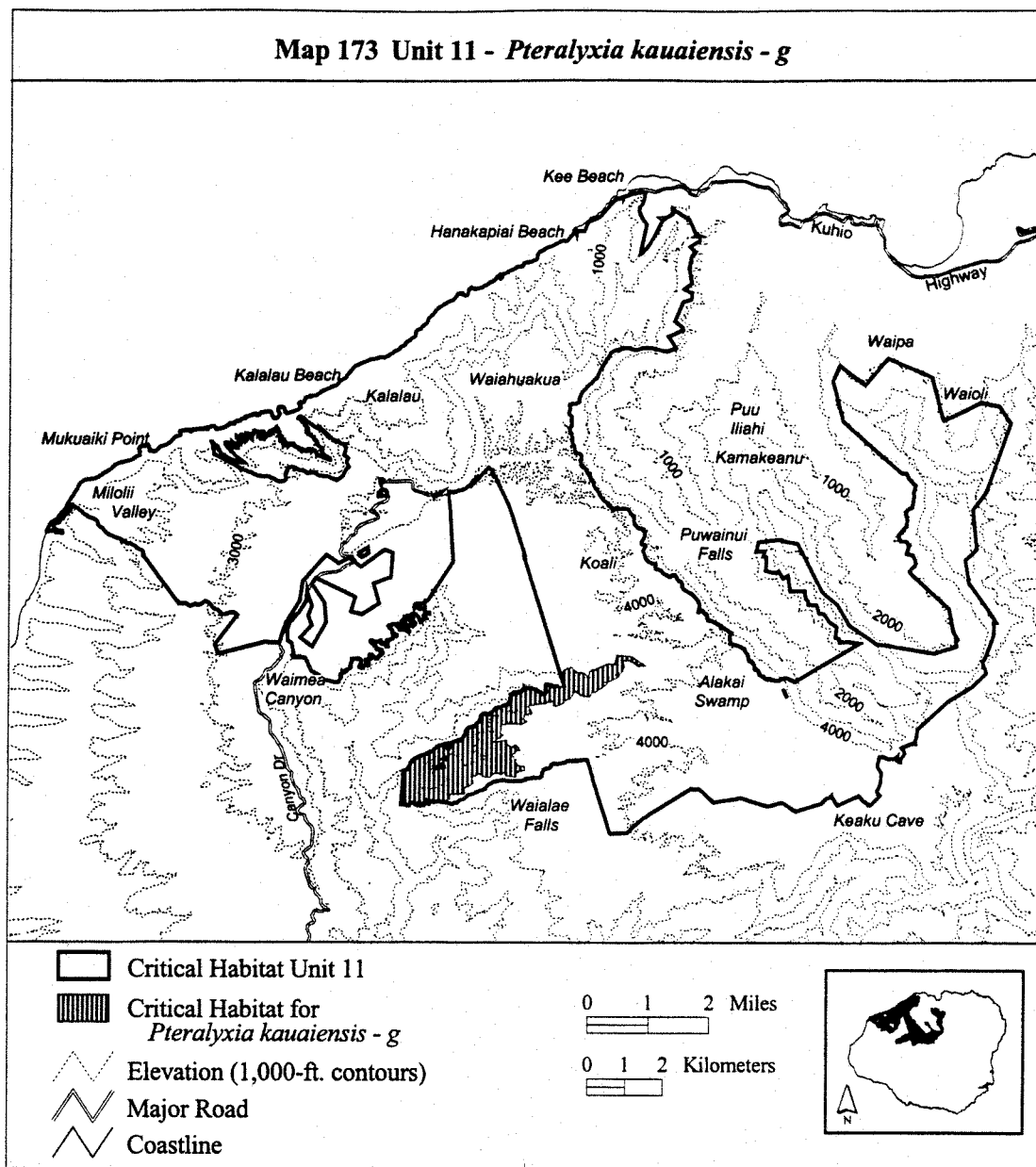
2448935; 426830, 2448946; 426865, 2448996; 426916, 2449001; 426976, 2448996; 427021, 2449001; 427096, 2449031; 427131, 2449051; 427237, 2449021; 427372, 2449006; 427513, 2449041; 427578, 2449031; 427638, 2449051; 427679, 2449061; 427814, 2449036; 427884, 2449056; 427894, 2449132; 427844, 2449202; 427799, 2449282; 427623, 2449312; 427463, 2449317; 427307, 2449292; 427227, 2449302; 427131, 2449342; 427041, 2449398; 427081, 2449468; 427257, 2449498; 427407, 2449548; 427583, 2449668; 427679, 2449709; 427759,

2449663; 427834, 2449663; 427935, 2449678; 428040, 2449588; 428145, 2449377; 428271, 2449272; 428396, 2449237; 428452, 2449197; 428422, 2449177; 428301, 2449147; 428321, 2449086; 428376, 2449051; 428376, 2449016; 428452, 2448961; 428462, 2448896; 428442, 2448800; 428321, 2448775; 428266, 2448795; 428241, 2448785; 428216, 2448730; 428271, 2448660; 428306, 2448600; 428306, 2448582; 429490, 2448299; 429651, 2448166; 429727, 2448242; 429983, 2448223; 430125, 2448308; 430134, 2448147; 429859, 2448138; 429765, 2447986; 430030, 2447910; 429594, 2447854; 429547, 2447759; 429272, 2447797; 429224, 2447749; 429243, 2447664; 429338, 2447711; 429471,

2447598; 429565, 2447598; 429622, 2447560; 429565, 2447503; 429565, 2447427; 429651, 2447380; 429537, 2447323; 429480, 2447323; 429347, 2447446; 429347, 2447304; 427881, 2447774; 427879, 2447772; 427930, 2447722; 427914, 2447661; 427814, 2447666; 427598, 2447732; 427553, 2447727; 427523, 2447732; 427458, 2447772; 427387, 2447757; 427282, 2447842; 427247, 2447872; 427111, 2447887; 427056, 2447862; 427016, 2447912; 426931, 2447952; 426835, 2448008; 426750, 2448043; 426599, 2448113; 426589, 2448188; 426127, 2448336; 426097, 2448378; 426063, 2448412; 426051, 2448421; 426007, 2448440; 425989, 2448455; 425969, 2448492; 425954, 2448543; 425949,

2449067; 425764, 2448953; 425830,
2448991; 425934, 2449001; 426001,
2448953; 426399, 2449038; return to
starting point.

(B) **Note:** Map 173 follows:



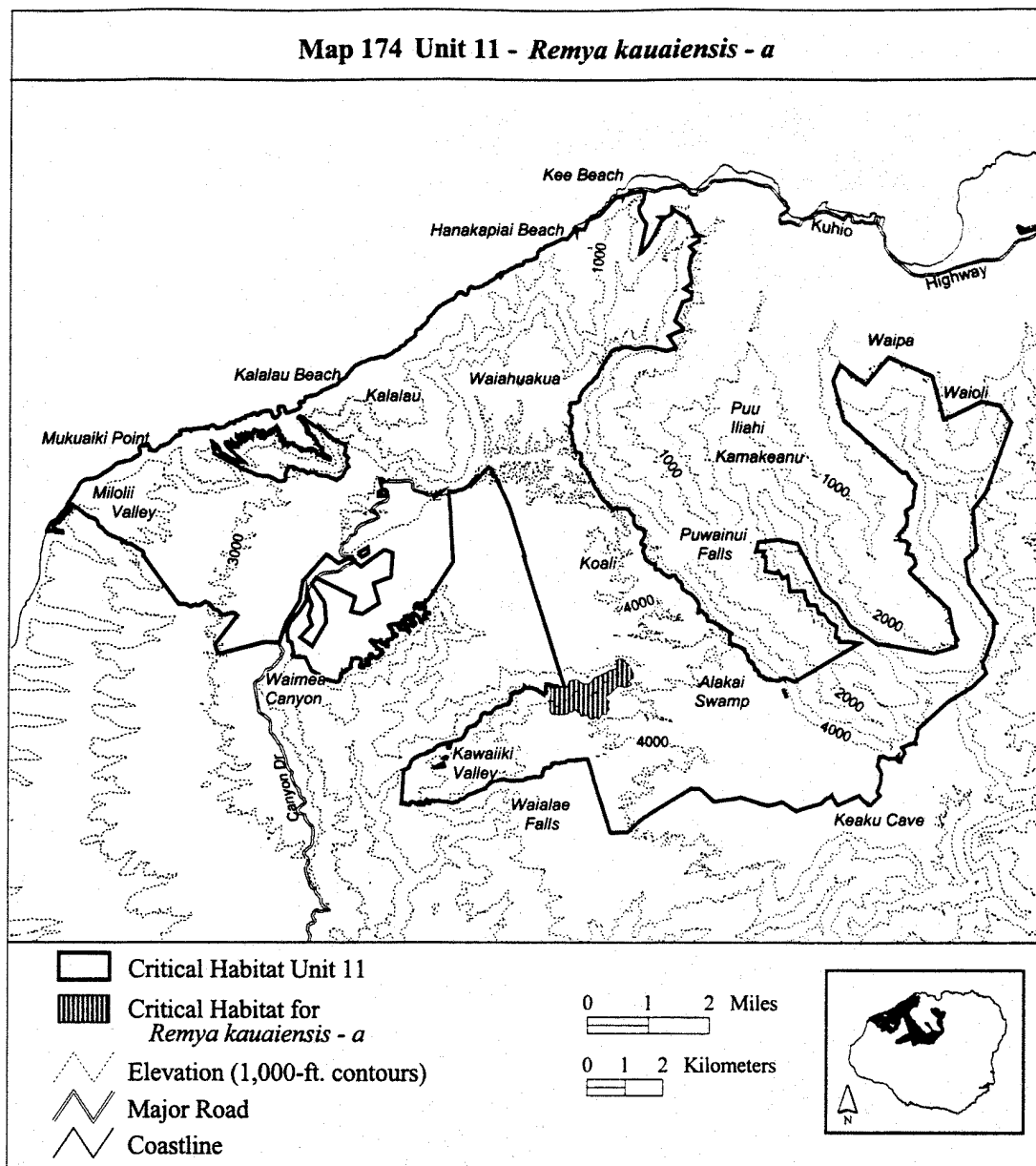
2444985; 439857, 2445003; 439897,
2444931; 439919, 2444896; 440004,
2444860; 440058, 2444753; 440107,
2444668; 440138, 2444623; 440143,
2444574; 440143, 2444539; 440143,
2444476; 440071, 2444445; 440018,
2444405; 440018, 2444374; 440067,
2444351; 440080, 2444302; 440058,
2444275; 439928, 2444231; 439830,
2444271; 439750, 2444267; 439678,
2444222; 439607, 2444137; 439495,
2444057; 439428, 2444008; 439415,

2443959; 439464, 2443887; 439500,
2443878; 439518, 2443861; 439486,
2443843; 439486, 2443812; 439477,
2443771; 439464, 2443770; 439500,
2443655; 439473, 2443620; 439446,
2443588; 439446, 2443539; 439428,
2443513; 439312, 2443513; 439294,
2443508; 439268, 2443450; 439241,

2443401; 439210, 2443392; 439187,
2443441; 439125, 2443441; 439067,
2443397; 439035, 2443392; 438955,
2443455; 438946, 2443486; 438919,
2443508; 438852, 2443499; 438803,
2443468; 438754, 2443481; 438750,
2443504; 438745, 2443544; 438719,
2443575; 438669, 2443575; 438669,

2443624; 438620, 2443647; 438585,
2443638; 438544, 2443602; 438473,
2443598; 438442, 2443593; 438415,
2443535; 438308, 2443513; 438085,
2443522; 438009, 2443526; 437955,
2443571; 437933, 2443665; 437940,
2443749; return to starting point.

(B) Note: Map 174 follows:



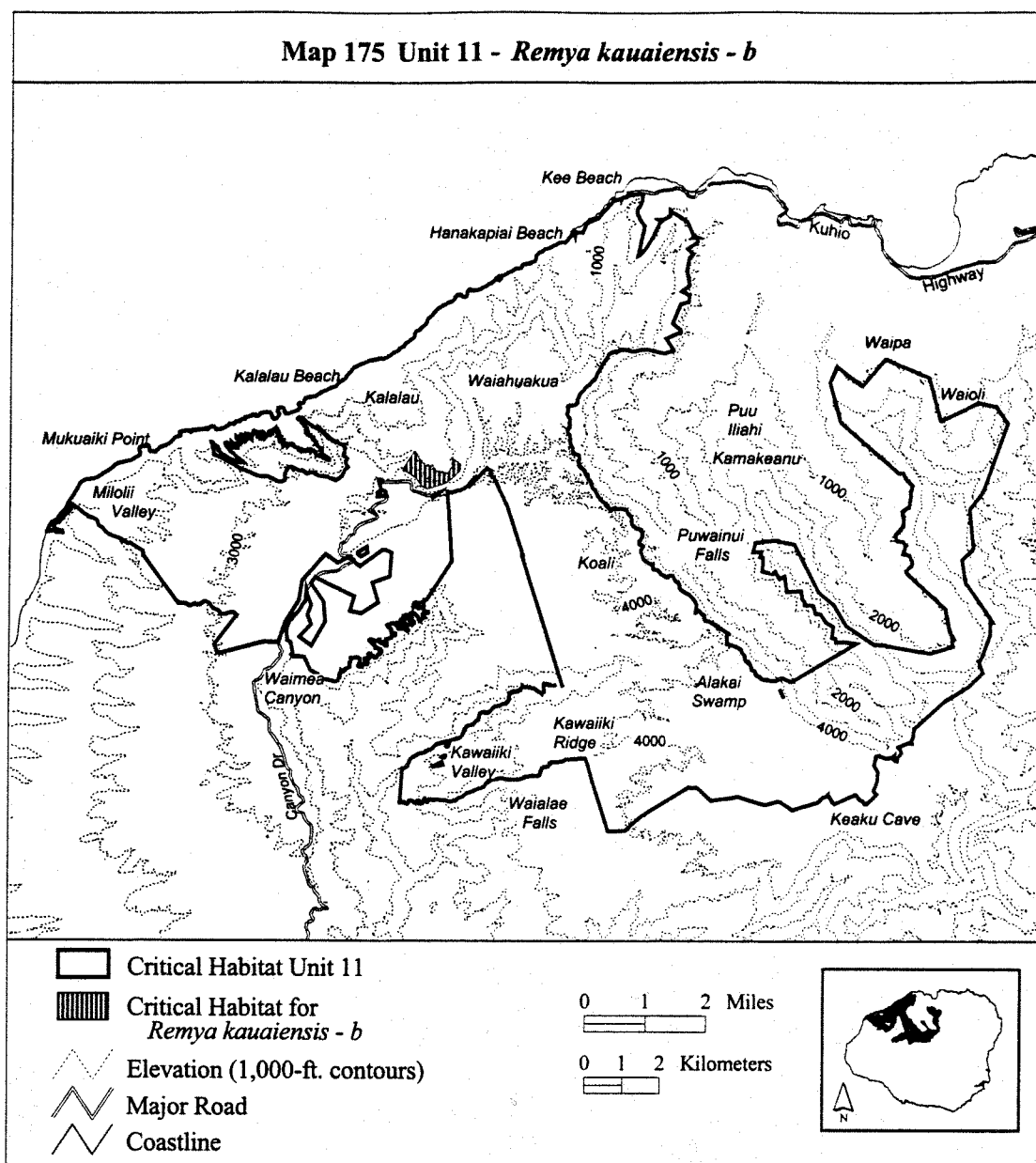
(clxxv) Kauai 11—*Remya kauaiensis*—b
(66 ha; 163 ac)

(A) Unit consists of the following 19
boundary points: Start at 434356,
2450470; 434503, 2450255; 434622,

2450093; 434841, 2450072; 434941,
2449932; 435078, 2449914; 435232,
2449871; 435368, 2450079; 435350,
2450294; 435580, 2450125; 435569,
2449953; 435472, 2449863; 435368,

2449752; 435167, 2449623; 434776,
2449484; 434694, 2449462; 434539,
2449541; 434381, 2449771; 434044,
2449989; return to starting point.

(B) Note: Map 175 follows:



(clxxvi) Kauai 11—*Remya kauaiensis*—c (886 ha; 2,190 ac)

(A) Unit consists of the following 119 boundary points: Start at 431977,

2448160; 432081, 2447933; 431820, 2447620; 431629, 2447412; 431298, 2447081; 431124, 2446995; 430828, 2447064; 430817, 2447078; 429798, 2446041; 429595, 2446048; 429654, 2446125; 429591, 2446167; 429485, 2446305; 429263, 2446389; 429094, 2446389; 428972, 2446421; 428904, 2446474; 428793, 2446542; 428774, 2446550; 428762, 2446580; 428765, 2446584; 429064, 2446531; 429021, 2446658; 429244, 2446797; 428914, 2446797; 428765, 2446882; 428648, 2446839; 428595, 2446892; 428659, 2447052; 428627, 2447073; 428648,

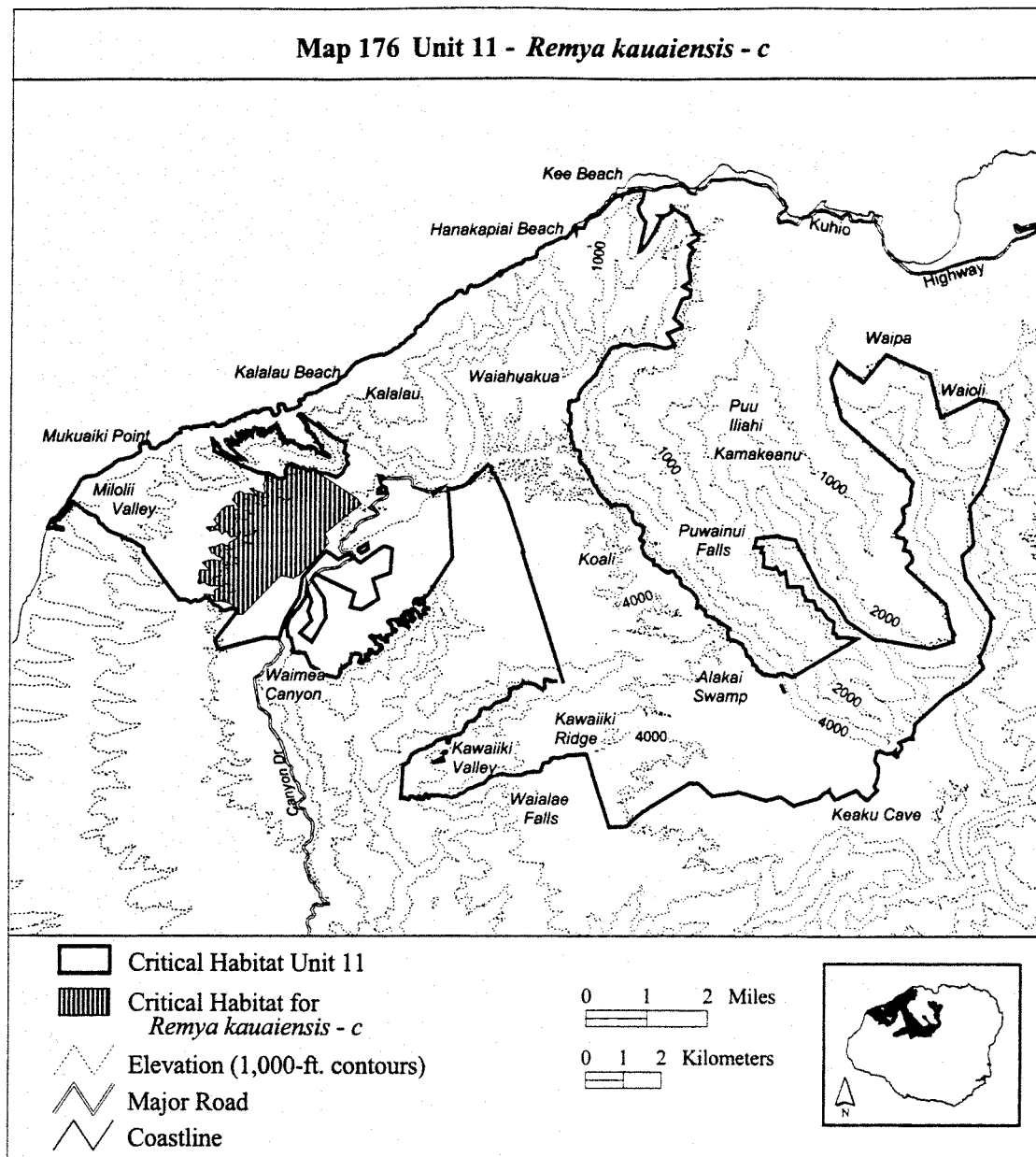
2447201; 428936, 2447211; 428808, 2447318; 428723, 2447414; 428904, 2447477; 429117, 2447477; 429202, 2447435; 429244, 2447541; 429085, 2447595; 429021, 2447658; 428968, 2447658; 428883, 2447797; 429085, 2447829; 429191, 2447914; 429266, 2447914; 429393, 2447839; 429425, 2447946; 429649, 2448063; 429628, 2448105; 429457, 2448095; 429340, 2448244; 429234, 2448158; 429138, 2448286; 428915, 2448244; 428829, 2448339; 429064, 2448361; 429149, 2448424; 429074, 2448478; 429032, 2448552; 429244, 2448829; 429362, 2448914; 429543, 2448924; 429564, 2448807; 429681, 2448818; 429649, 2448882; 429617, 2448967; 429511, 2449084; 429596, 2449254; 429734,

2449318; 429819, 2449233; 429958, 2449244; 430160, 2449169; 429968, 2449371; 430064, 2449382; 430075, 2449339; 430181, 2449307; 430362, 2449254; 430330, 2449414; 430330, 2449415; 430366, 2449436; 430355, 2449451; 430349, 2449466; 430335, 2449474; 430320, 2449476; 430320, 2449477; 430394, 2449658; 430350, 2449658; 430348, 2449666; 430376, 2449750; 430384, 2449766; 430406, 2449796; 430471, 2449787; 430527, 2449754; 430583, 2449736; 430635, 2449693; 430696, 2449656; 430720, 2449646; 430819, 2449646; 430899, 2449674; 430918, 2449717; 430904, 2449834; 430927, 2449905; 430955, 2449985; 430993, 2450032; 431068, 2450041; 431153, 2450008; 431238,

2449970; 431285, 2449942; 431360,
2449956; 431449, 2449886; 431497,
2449867; 431605, 2449895; 431632,

2449893; 432647, 2449237; 432672,
2449222; 432832, 2449094; 432927,

2448966; 432512, 2448626; 431953,
2448167; return to starting point.
(B) Note: Map 176 follows:



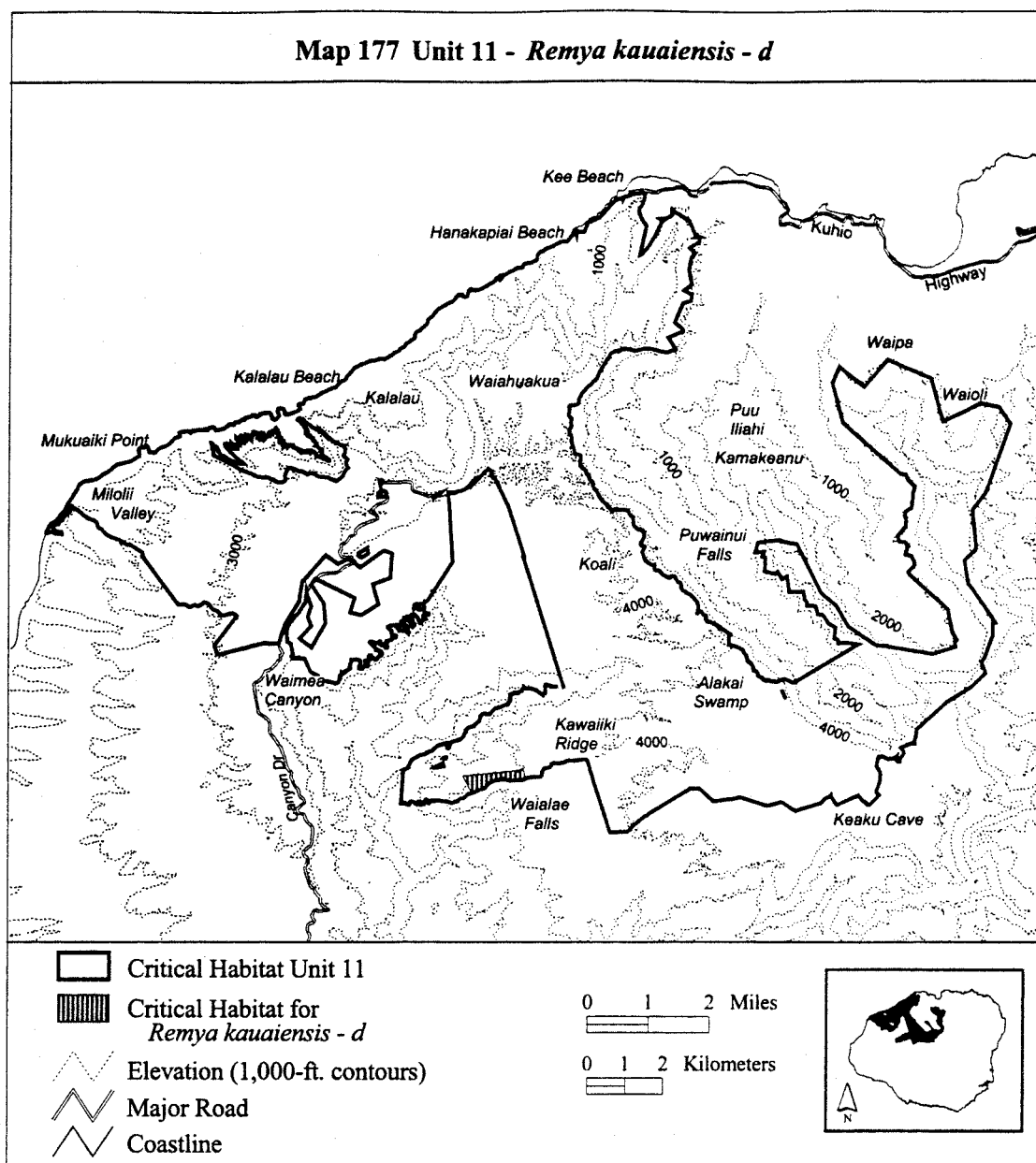
(clxxvii) Kauai 11—*Remya kauaiensis*—
d (47 ha; 115 ac)

(A) Unit consists of the following 51
boundary points: Start at 435663,
2441899; 437117, 2442058; 437240,
2442106; 437316, 2441834; 437287,
2441816; 437274, 2441809; 437240,
2441796; 437224, 2441791; 437181,
2441781; 437150, 2441777; 437111,
2441777; 437096, 2441779; 437062,

2441776; 437008, 2441775; 436960,
2441776; 436912, 2441780; 436895,
2441784; 436825, 2441795; 436799,
2441801; 436777, 2441809; 436730,
2441820; 436695, 2441811; 436666,
2441808; 436638, 2441803; 436618,
2441796; 436593, 2441792; 436583,
2441789; 436541, 2441785; 436492,
2441773; 436453, 2441759; 436419,
2441739; 436408, 2441737; 436374,
2441718; 436357, 2441708; 436342,

2441700; 436319, 2441681; 436285,
2441639; 436272, 2441618; 436247,
2441590; 436228, 2441575; 436203,
2441564; 436181, 2441558; 436167,
2441552; 436155, 2441546; 436121,
2441536; 436070, 2441515; 436039,
2441504; 436027, 2441501; 435983,
2441481; 435950, 2441467; 435894,
2441450; return to starting point.

(B) Note: Map 177 follows:



(clxxviii) Kauai 11—*Remya kauaiensis*—e (66 ha, 163 ac)

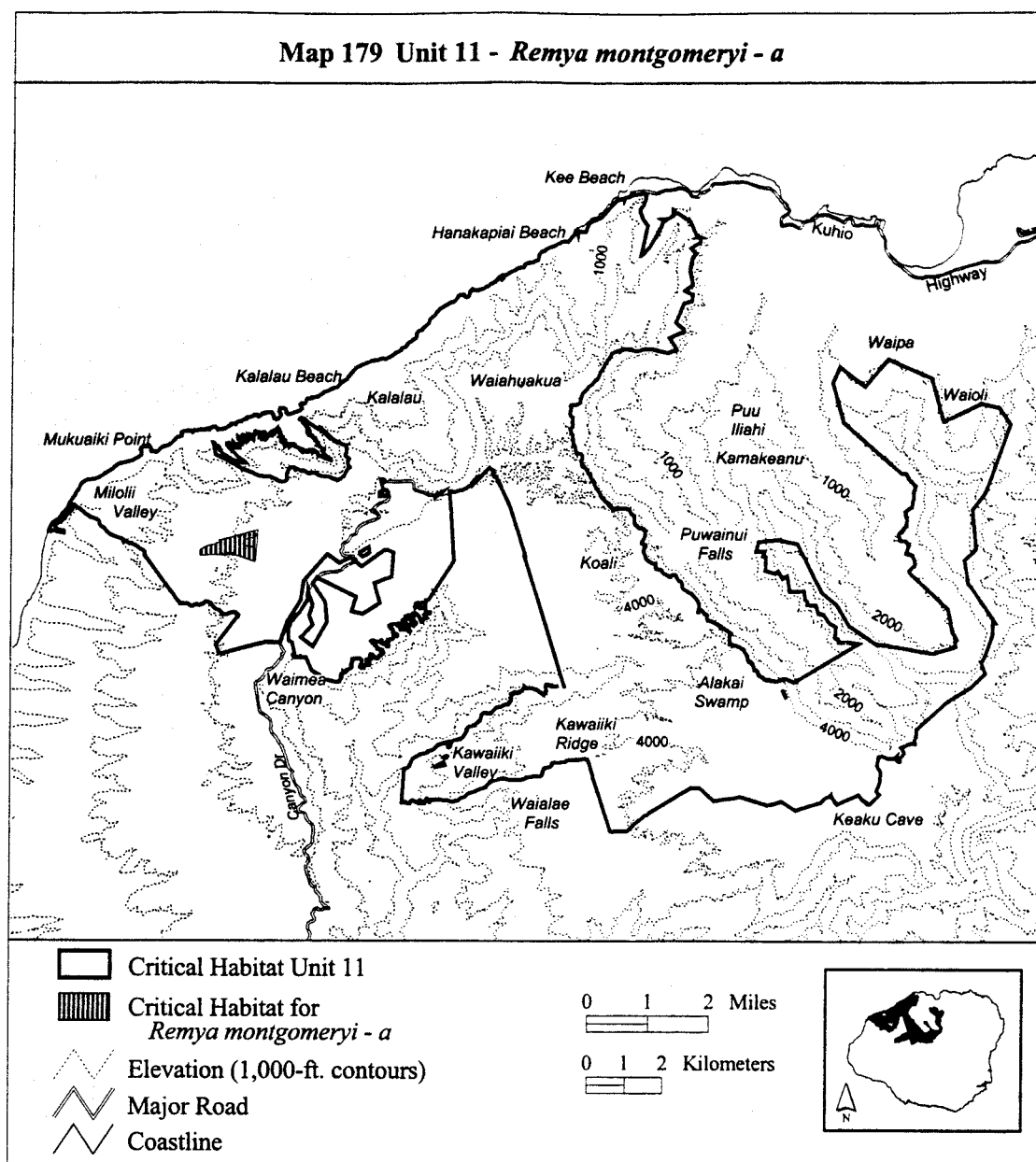
(A) Unit consists of the following 48 boundary points: Start at 437855, 2445706; 437877, 2445731; 437906, 2445821; 437983, 2445872; 437996, 2445968; 438025, 2445891; 438060, 2445843; 438124, 2445965; 438197, 2445865; 438213, 2445843; 438178, 2445750; 438293, 2445689; 438341,

2445734; 438438, 2445779; 438450, 2445747; 438393, 2445660; 438341, 2445593; 438505, 2445580; 438572, 2445708; 438575, 2445763; 438658, 2445766; 438646, 2445664; 438646, 2445616; 438713, 2445667; 438777, 2445628; 438918, 2445792; 438953, 2445744; 439030, 2445811; 439251, 2445897; 439289, 2445958; 439318, 2445919; 439328, 2445836; 439318,

2445679; 439286, 2445555; 439257, 2445401; 439187, 2445295; 439136, 2445260; 438969, 2445228; 438905, 2445151; 438851, 2445110; 438831, 2445107; 438700, 2445203; 438559, 2445267; 438470, 2445308; 438361, 2445331; 438303, 2445382; 438236, 2445382; 437929, 2445478; return to starting point.

(B) Note: Map 178 follows:





(clxxx) Kauai 11—*Remya montgomeryi*—b (1,010 ha; 2,496 ac)

(A) Unit consists of the following 245 boundary points: Start at 442448, 2445805; 442665, 2445511; 442672, 2445510; 442668, 2445494; 442667, 2445490; 442671, 2445471; 442675, 2445453; 442682, 2445433; 442689, 2445419; 442694, 2445414; 442709, 2445399; 442727, 2445386; 442743, 2445378; 442747, 2445377; 442765, 2445370; 442785, 2445364; 442798, 2445359; 442804, 2445357; 442821, 2445353; 442842, 2445347; 442858, 2445342; 442862, 2445341; 442877, 2445336; 442898, 2445330; 442915, 2445323; 442934, 2445314; 442952, 2445303; 442956, 2445301; 442972, 2445292; 442981, 2445284; 442990,

2445276; 443009, 2445266; 443029, 2445263; 443047, 2445260; 443065, 2445247; 443068, 2445227; 443066, 2445209; 443066, 2445190; 443083, 2445171; 443103, 2445152; 443122, 2445132; 443135, 2445115; 443140, 2445105; 443144, 2445096; 443150, 2445078; 443152, 2445059; 443153, 2445040; 443153, 2445020; 443156, 2445003; 443158, 2444995; 443163, 2444984; 443175, 2444965; 443177, 2444962; 443193, 2444946; 443196, 2444944; 443215, 2444938; 443234, 2444932; 443240, 2444927; 443252, 2444914; 443260, 2444907; 443271, 2444898; 443281, 2444890; 443290, 2444876; 443294, 2444870; 443301, 2444851; 443307, 2444833; 443309, 2444829; 443313, 2444815; 443320,

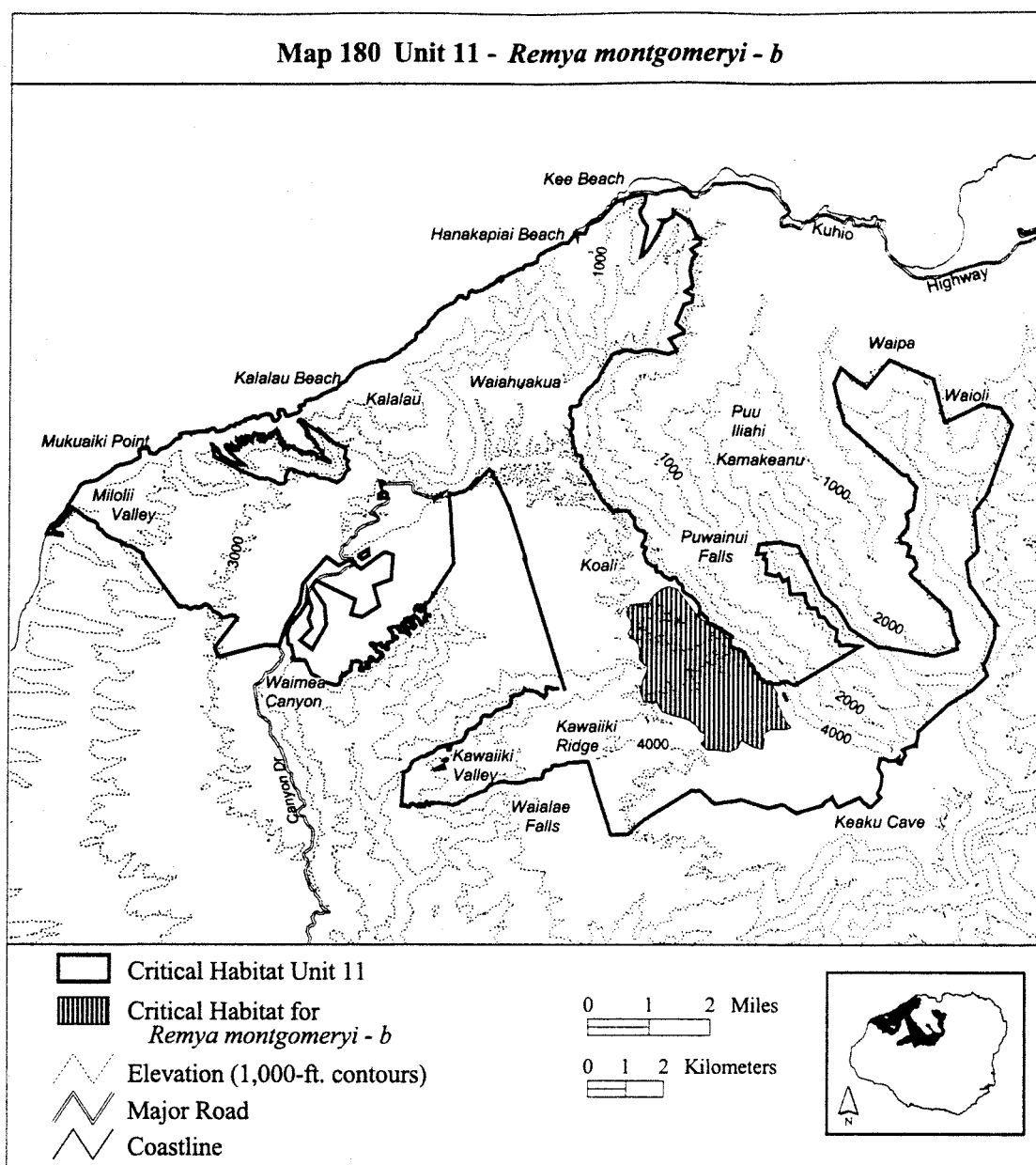
2444796; 443327, 2444778; 443333, 2444758; 443341, 2444740; 443346, 2444728; 443352, 2444721; 443366, 2444706; 443373, 2444702; 443385, 2444699; 443403, 2444695; 443423, 2444686; 443435, 2444664; 443440, 2444655; 443443, 2444647; 443444, 2444627; 443447, 2444608; 443452, 2444591; 443459, 2444579; 443464, 2444570; 443478, 2444555; 443483, 2444551; 443497, 2444548; 443516, 2444546; 443534, 2444543; 443553, 2444537; 443557, 2444532; 443571, 2444521; 443579, 2444514; 443598, 2444493; 443610, 2444483; 443617, 2444477; 443628, 2444469; 443647, 2444460; 443666, 2444456; 443677, 2444459; 443685, 2444463; 443703, 2444469; 443722, 2444464; 443732,

2444458; 443740, 2444454; 443760,
2444446; 443769, 2444440; 443778,
2444434; 443793, 2444421; 443804,
2444409; 443811, 2444401; 443815,
2444392; 443818, 2444383; 443824,
2444364; 443829, 2444347; 443835,
2444332; 443836, 2444327; 443846,
2444307; 443853, 2444296; 443857,
2444289; 443865, 2444271; 443871,
2444260; 443875, 2444247; 443889,
2444232; 443902, 2444214; 443910,
2444204; 443915, 2444196; 443929,
2444175; 443934, 2444158; 443936,
2444133; 443931, 2444120; 443927,
2444113; 443925, 2444103; 443924,
2444082; 443925, 2444064; 443926,
2444045; 443928, 2444028; 443931,
2444009; 443935, 2443990; 443936,
2443970; 443934, 2443951; 443934,
2443934; 443935, 2443915; 443939,
2443896; 443945, 2443877; 443955,
2443857; 443963, 2443839; 443965,
2443836; 443972, 2443821; 443984,
2443805; 443987, 2443801; 444000,

2443783; 444003, 2443777; 444005,
2443764; 444012, 2443746; 444022,
2443733; 444025, 2443727; 444035,
2443709; 444041, 2443694; 444041,
2443690; 444048, 2443672; 444055,
2443652; 444056, 2443633; 444051,
2443614; 444051, 2443596; 444058,
2443577; 444080, 2443566; 444096,
2443558; 444114, 2443539; 444125,
2443521; 444133, 2443503; 444134,
2443498; 444139, 2443484; 444146,
2443464; 444153, 2443447; 444164,
2443427; 444171, 2443417; 444180,
2443407; 444191, 2443390; 444202,
2443371; 444210, 2443360; 444215,
2443352; 444228, 2443337; 444232,
2443334; 444246, 2443322; 444259,
2443315; 444267, 2443312; 444285,
2443303; 444288, 2443300; 444287,
2443267; 444175, 2443218; 443802,
2443211; 443603, 2443118; 443591,
2442857; 443541, 2442683; 443305,
2442739; 442975, 2442920; 442895,
2442714; 442665, 2442609; 442310,

2442665; 442080, 2442671; 441918,
2442827; 441999, 2442901; 442024,
2443094; 441887, 2443131; 441788,
2443305; 441583, 2443454; 441135,
2443585; 440886, 2443666; 440799,
2443803; 440762, 2443921; 440538,
2443927; 440402, 2443914; 440314,
2444219; 440370, 2444480; 440445,
2444666; 440501, 2444859; 440420,
2444909; 440259, 2445052; 440296,
2445238; 440265, 2445387; 440190,
2445530; 440035, 2445648; 439973,
2445735; 440047, 2445872; 440047,
2446052; 439948, 2446195; 440022,
2446469; 440513, 2446543; 440625,
2446717; 440843, 2446885; 441042,
2446972; 441274, 2446893; 441832,
2446159; 442113, 2445986; 442326,
2445854; 442415, 2445847; 442422,
2445840; 442430, 2445830; 442430,
2445827; 442435, 2445813; 442444,
2445807; return to starting point.

(B) **Note:** Map 180 follows:



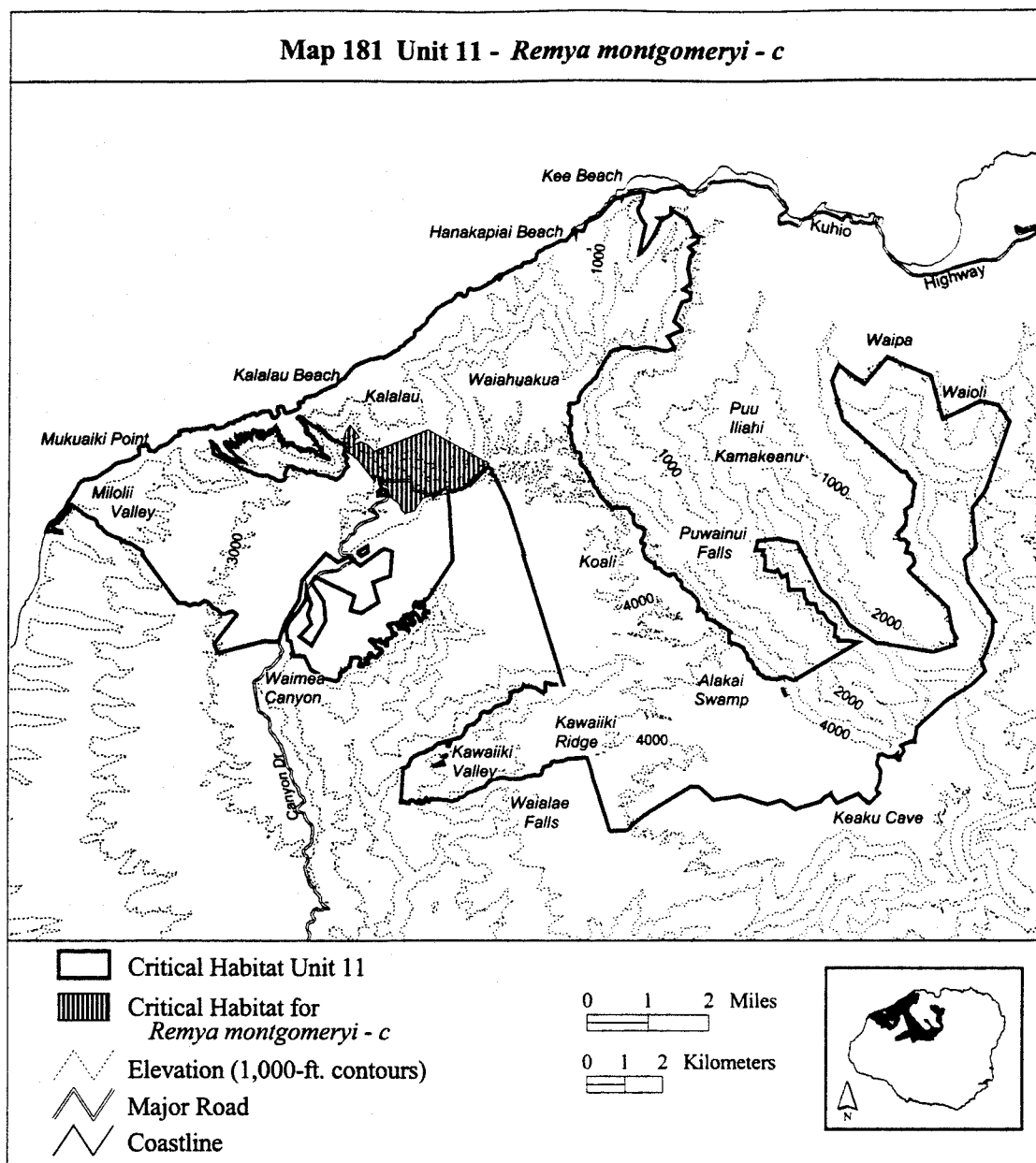
(clxxxi) Kauai 11—*Remya montgomeryi*—c (435 ha; 1,076 ac)

(A) Unit consists of the following 73 boundary points: Start at 434088, 2448772; 434057, 2448814; 433978, 2448898; 433944, 2448994; 433902, 2449074; 433692, 2449220; 433659, 2449275; 433659, 2449342; 433625, 2449489; 433500, 2449564; 433462, 2449619; 433461, 2449623; 433480, 2449629; 433484, 2449703; 433460, 2449707; 433444, 2449707; 433441, 2449723; 433318, 2449783; 433292, 2449640; 432855, 2450187; 432823,

2450206; 432826, 2450224; 432797, 2450260; 432768, 2450266; 432752, 2450270; 432745, 2450272; 432733, 2450275; 432709, 2450317; 432692, 2450330; 432650, 2450343; 432591, 2450373; 432573, 2450385; 432550, 2450412; 432528, 2450468; 432515, 2450503; 432494, 2450543; 432477, 2450580; 432468, 2450593; 432464, 2450611; 432465, 2450623; 432450, 2450624; 432445, 2450625; 432435, 2450666; 432502, 2450935; 432628, 2451128; 432889, 2450808; 432771, 2450766; 432737, 2450598; 432897,

2450691; 433099, 2450615; 433217, 2450489; 433248, 2450427; 434703, 2451005; 436330, 2450099; 436237, 2450032; 436212, 2450009; 436203, 2450009; 436111, 2449924; 436109, 2449918; 435562, 2449429; 435168, 2449400; 435010, 2449343; 435011, 2449352; 434884, 2449298; 434872, 2449294; 434833, 2449281; 434833, 2449280; 434814, 2449273; 434573, 2449187; 434342, 2448860; 434340, 2448859; 434109, 2448774; 434091, 2448768; return to starting point.

(B) **Note:** Map 181 follows:



(clxxxii) Kauai 11—*Schiedea apokremnos*—a (170 ha; 420 ac)

(A) Unit consists of the following 121 boundary points: Start at 432745, 2452425; 434404, 2451114; 434287, 2451030; 434135, 2451007; 434062, 2451170; 433978, 2451164; 433917, 2450991; 433698, 2450985; 433608, 2450963; 433524, 2451170; 433328, 2451041; 433188, 2451120; 433322, 2451237; 433132, 2451249; 433143, 2451316; 433210, 2451411; 433126, 2451411; 433098, 2451450; 433132, 2451512; 433109, 2451568; 433126, 2451663; 432980, 2451618; 432969, 2451714; 432919, 2451708; 432812, 2451742; 432773, 2451669; 432689, 2451842; 432621, 2451820; 432571, 2451803; 432537, 2451730; 432504,

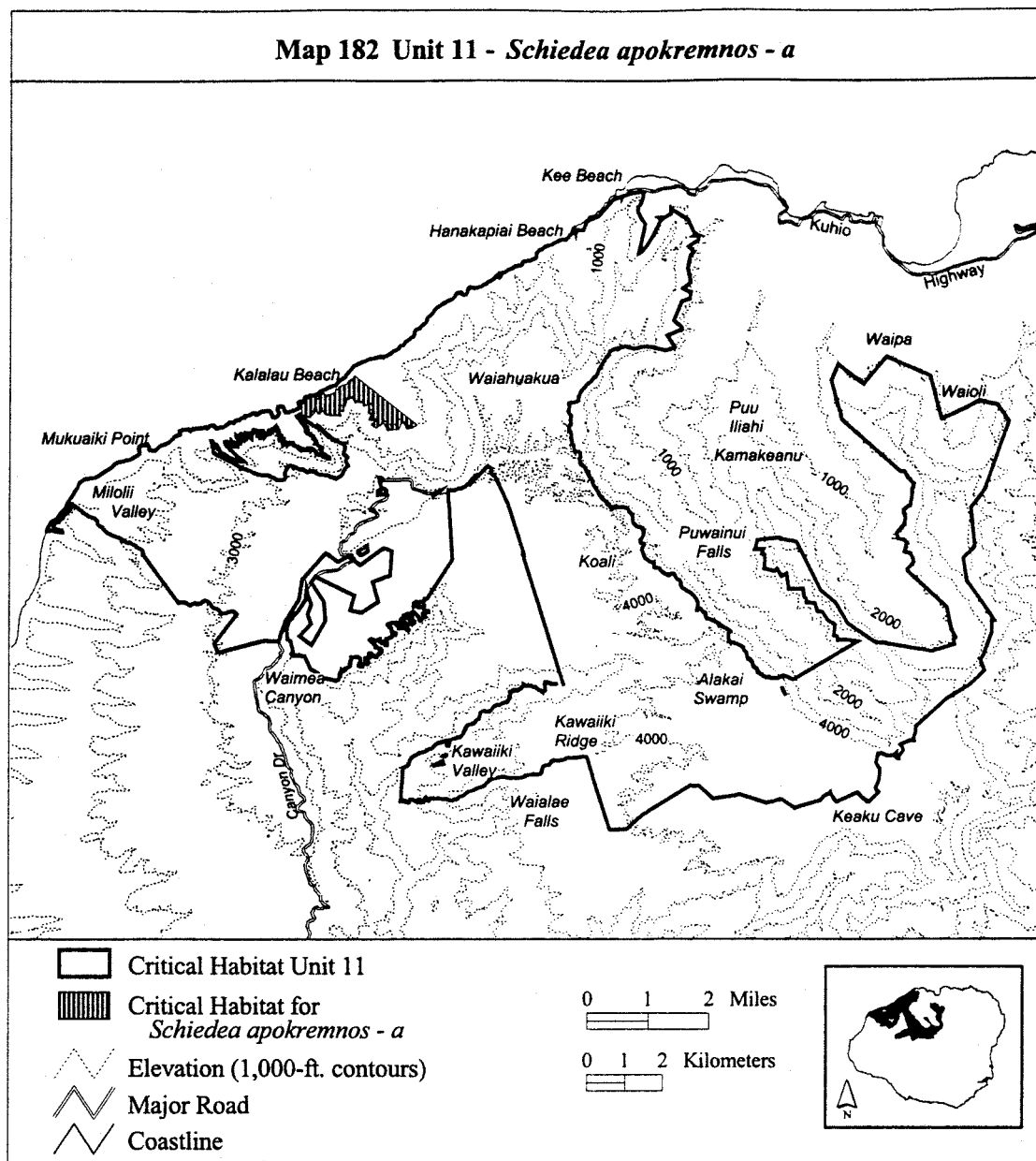
2451635; 432453, 2451590; 432453, 2451467; 432347, 2451490; 432347, 2451450; 432392, 2451355; 432319, 2451350; 432201, 2451372; 432139, 2451366; 432016, 2451383; 431932, 2451439; 431893, 2451507; 431831, 2451411; 431775, 2451411; 431736, 2451507; 431657, 2451423; 431618, 2451367; 431579, 2451299; 431511, 2451311; 431416, 2451367; 431378, 2451323; 431373, 2451329; 431370, 2451323; 431360, 2451314; 431351, 2451321; 431337, 2451323; 431318, 2451324; 431304, 2451317; 431293, 2451316; 431287, 2451322; 431281, 2451336; 431277, 2451355; 431264, 2451350; 431245, 2451336; 431233, 2451323; 431242, 2451310; 431267, 2451297; 431294, 2451278; 431312,

2451246; 431348, 2451203; 431384, 2451176; 431402, 2451170; 431407, 2451149; 431415, 2451137; 431428, 2451129; 431432, 2451109; 431442, 2451094; 431457, 2451086; 431456, 2451081; 431450, 2451067; 431455, 2451053; 431467, 2451047; 431486, 2451047; 431488, 2451038; 431482, 2451029; 431481, 2451010; 431487, 2450998; 431504, 2450987; 431499, 2450978; 431486, 2450974; 431476, 2450971; 431456, 2450971; 431455, 2450971; 431158, 2451367; 431349, 2451456; 431321, 2451557; 431287, 2451714; 431371, 2451669; 431438, 2451820; 431461, 2451787; 431567, 2451848; 431685, 2451893; 431769, 2451798; 431808, 2451826; 431775, 2451882; 431853, 2451910; 431937,

2451966; 432016, 2451865; 432027,
2451915; 432083, 2451927; 432150,
2451938; 432223, 2451988; 432251,

2452067; 432319, 2452039; 432319,
2452111; 432448, 2452184; 432532,
2452201; 432593, 2452291; 432672,

2452313; 432706, 2452246; 432700,
2452369; return to starting point.
(B) Note: Map 182 follows:



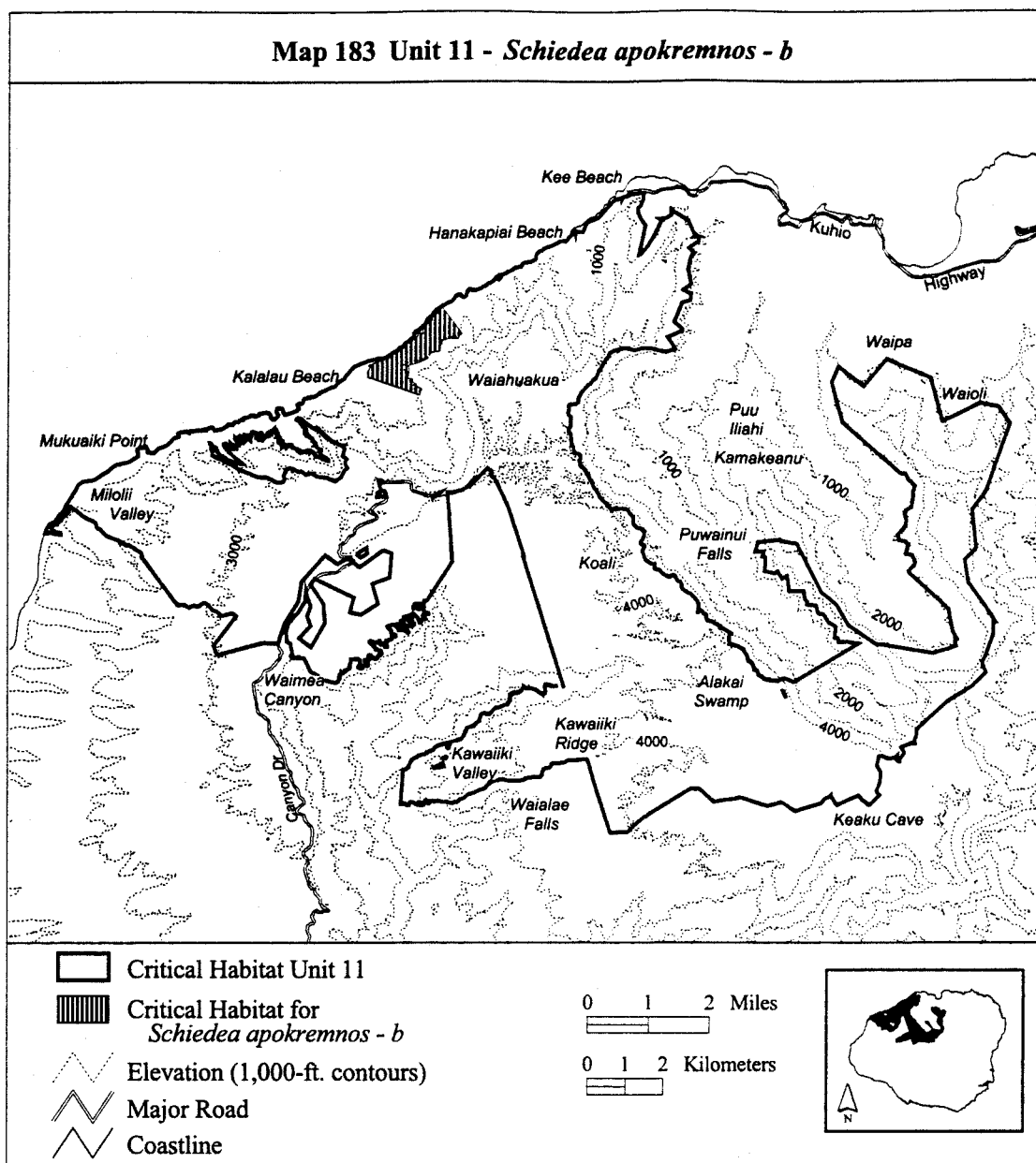
(clxxxiii) Kauai 11—*Schiedea apokremnos*—b (187 ha; 463 ac)

(A) Unit consists of the following 49 boundary points: Start at 435094, 2454278; 435593, 2453600; 435509, 2453505; 435509, 2453460; 435374, 2453455; 435279, 2453455; 435184, 2453449; 435077, 2453393; 435083, 2453309; 435038, 2453287; 435015, 2453130; 434982, 2453113; 434892,

2453113; 434774, 2453068; 434713, 2452945; 434601, 2452884; 434483, 2452816; 434180, 2452744; 434203, 2452592; 434169, 2452385; 434309, 2452374; 434309, 2452307; 434388, 2452245; 434371, 2452195; 434533, 2452116; 434488, 2451948; 433115, 2452430; 433092, 2452565; 433171, 2452677; 433132, 2452722; 433311, 2452806; 433704, 2452951; 433743,

2452957; 433788, 2453029; 433995, 2453164; 434085, 2453242; 434186, 2453332; 434354, 2453438; 434421, 2453516; 434427, 2453617; 434561, 2453584; 434567, 2453712; 434657, 2453819; 434780, 2453964; 434802, 2453948; 434802, 2454032; 434903, 2454149; 434971, 2454132; 434993, 2454233; return to starting point.

(B) Note: Map 183 follows:



(clxxxiv) Kauai 11—*Schiedea apokremnos*—c (295 ha; 730 ac)

(A) Unit consists of the following 184 boundary points: coastline; 425961, 2449457; 425945, 2449431; 426025, 2449417; 426119, 2449388; 426206, 2449330; 426264, 2449199; 426496, 2449105; 426662, 2449004; 426800, 2448866; 427032, 2448743; 427068, 2448642; 426966, 2448569; 426829, 2448606; 426503, 2448743; 426445, 2448765; 426401, 2448707; 426336, 2448693; 426336, 2448642; 426322, 2448577; 426264, 2448540; 426170, 2448591; 426025, 2448729; 425974, 2448707; 425858, 2448700; 425786, 2448707; 425692, 2448779; 425525, 2448852; 425484, 2448870; 425466, 2448885; 425424, 2448946; 425344,

2449011; 425235, 2449076; 425217, 2449149; 425395, 2449439; 425453, 2449540; 425525, 2449547; 425721, 2449569; 425736, 2449562; 425833, 2449576; 426041, 2449624; 426274, 2449816; 426427, 2449928; 426555, 2450065; 426804, 2450065; 427045, 2450185; 427133, 2450313; 427085, 2450490; 427141, 2450530; 427165, 2450466; 427197, 2450546; 427245, 2450554; 427302, 2450425; 427534, 2450353; 427639, 2450393; 427671, 2450369; 427711, 2450441; 428008, 2450618; 428136, 2450682; 428184, 2450794; 428152, 2450947; 428257, 2450955; 428329, 2450987; 428353, 2450850; 428385, 2450730; 428385, 2450586; 428329, 2450514; 428377, 2450433; 428425, 2450506; 428425,

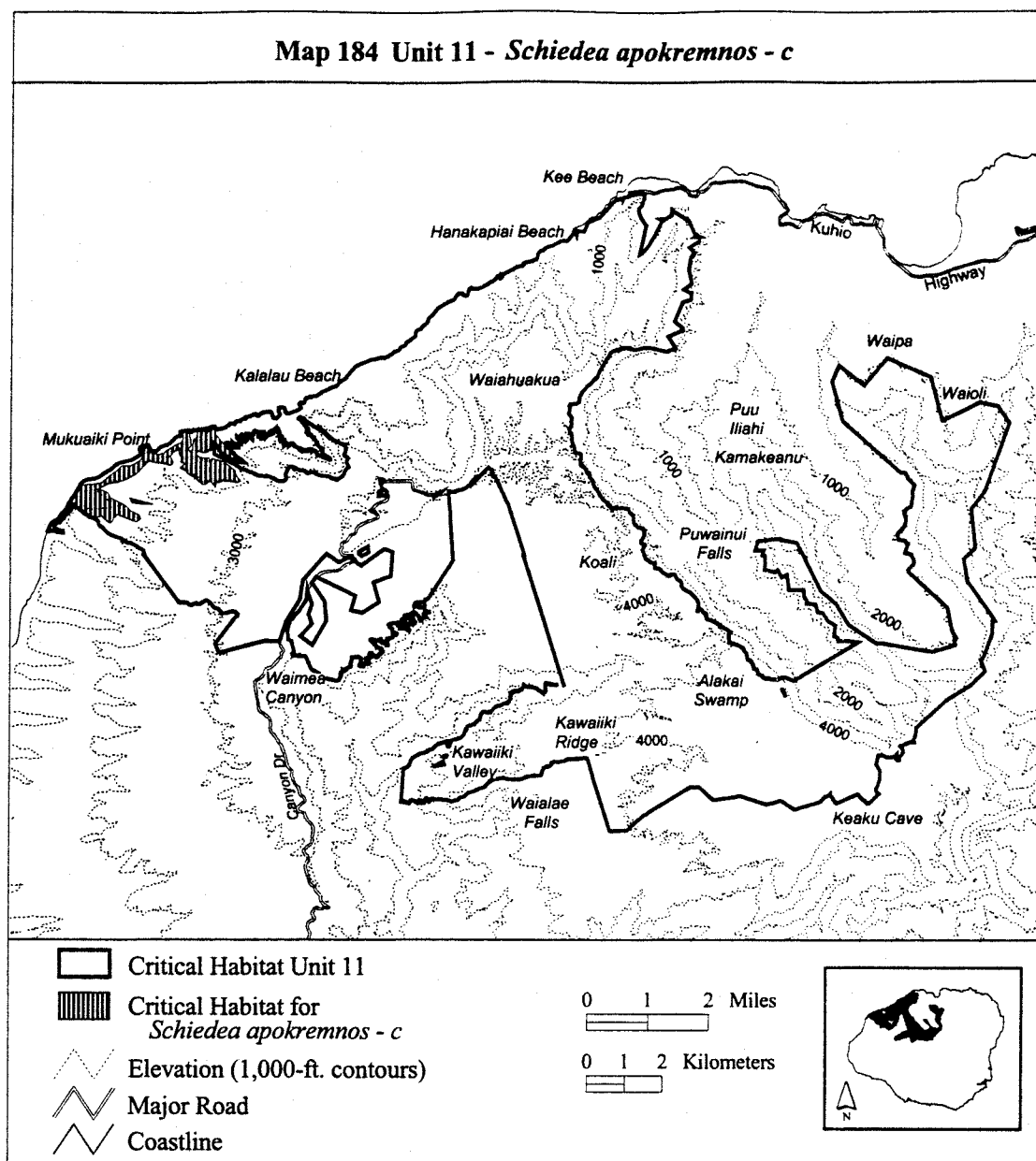
2450618; 428481, 2450770; 428538, 2450778; 428538, 2450858; 428570, 2450979; 428650, 2451011; 428714, 2450987; 428794, 2450987; 428834, 2450923; 428899, 2451059; 428955, 2451067; 429035, 2450987; 429051, 2450882; 429099, 2450834; 429139, 2450810; 429629, 2450177; 429625, 2450178; 429610, 2450183; 429571, 2450198; 429538, 2450212; 429503, 2450229; 429460, 2450248; 429433, 2450259; 429404, 2450268; 429391, 2450277; 429371, 2450289; 429356, 2450303; 429342, 2450315; 429321, 2450332; 429294, 2450343; 429269, 2450357; 429244, 2450363; 429232, 2450370; 429208, 2450389; 429205, 2450394; 429200, 2450405; 429193, 2450416; 429174, 2450426; 429162,

2450435; 429162, 2450436; 429161,
2450444; 429158, 2450455; 429152,
2450468; 429143, 2450481; 429132,
2450492; 429114, 2450527; 429113,
2450540; 429110, 2450557; 429103,
2450577; 429091, 2450594; 429077,
2450605; 429069, 2450606; 429067,
2450610; 429011, 2450630; 429009,
2450638; 429000, 2450655; 428990,
2450676; 428979, 2450690; 428972,
2450701; 428962, 2450707; 428952,
2450706; 428952, 2450704; 428964,
2450654; 428975, 2450624; 428947,
2450498; 428899, 2450449; 428770,

2450409; 428554, 2450449; 428546,
2450353; 428698, 2450273; 428875,
2450273; 428867, 2450169; 428955,
2450265; 429083, 2450233; 429268,
2450161; 429436, 2450048; 429541,
2449952; 429589, 2449800; 429717,
2449663; 429637, 2449615; 429461,
2449647; 429292, 2449648; 429260,
2449680; 429196, 2449631; 429075,
2449607; 429035, 2449487; 428907,
2449664; 428810, 2449583; 428714,
2449559; 428626, 2449632; 428546,
2449728; 428473, 2449760; 428289,
2449872; 428249, 2449944; 428104,

2449992; 428233, 2450113; 428120,
2450145; 428136, 2450265; 428104,
2450329; 428088, 2450361; 428088,
2450498; 427936, 2450425; 427855,
2450305; 427936, 2450145; 427879,
2450081; 427639, 2450113; 427462,
2450137; 427285, 2450177; 427165,
2450057; 427053, 2449952; 426940,
2449832; 426643, 2449672; 426435,
2449624; 426242, 2449584; 426170,
2449559; 425969, 2449455; coastline.

(B) Note: Map 184 follows:



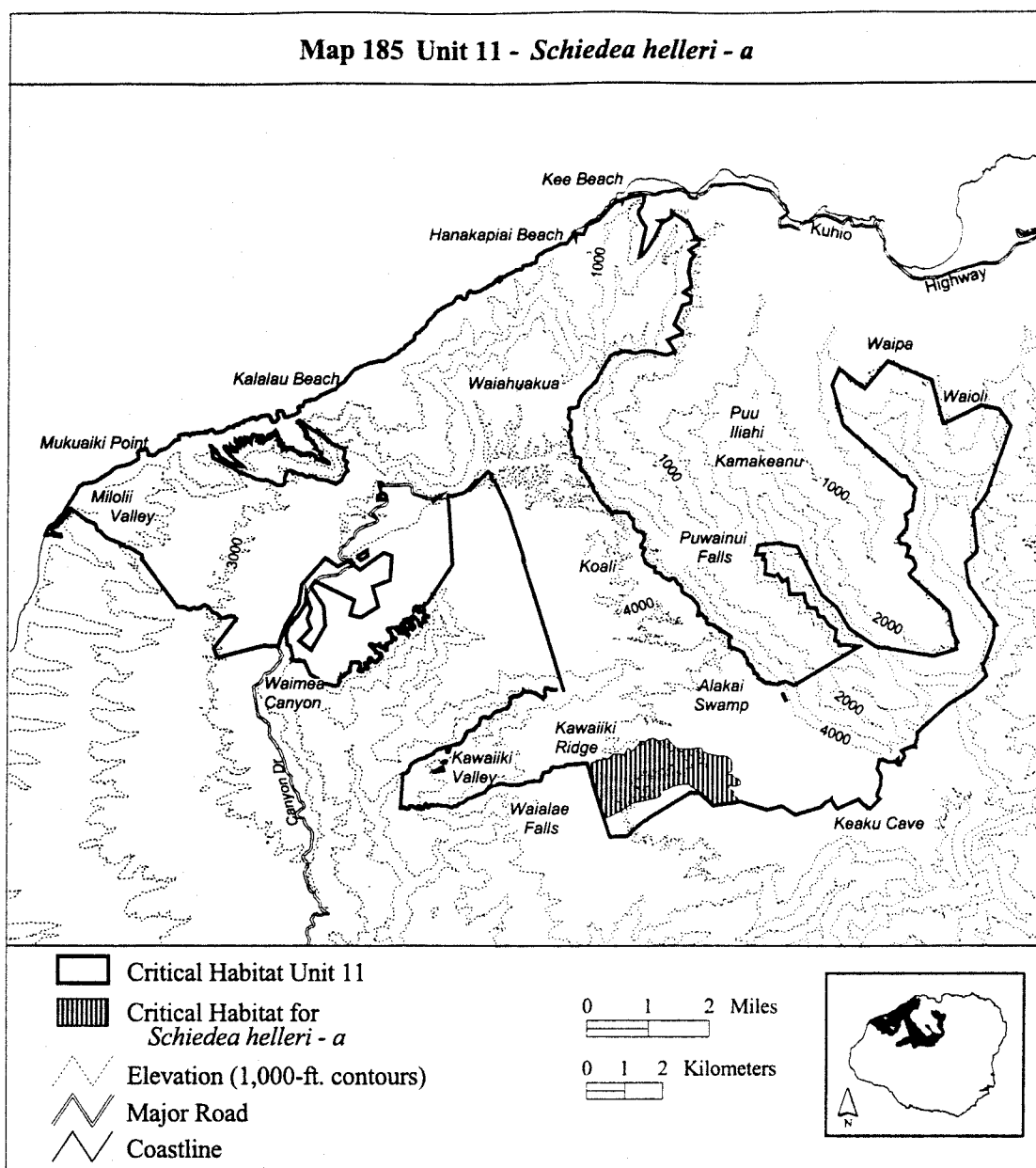
(clxxxv) Kauai 11—*Schiedea helleri*—a
(485 ha; 1,198 ac)

(A) Unit consists of the following 100 boundary points: Start at 439125, 2441965; 439082, 2442134; 439060, 2442238; 439038, 2442310; 439065, 2442364; 439202, 2442397; 439262, 2442430; 439514, 2442474; 439586, 2442550; 439651, 2442589; 439788, 2442589; 439876, 2442567; 439925, 2442561; 439969, 2442649; 440018, 2442737; 440035, 2442747; 440073, 2442698; 440073, 2442665; 440150, 2442682; 440248, 2442791; 440363, 2442906; 440407, 2442917; 440468, 2442895; 440577, 2442983; 440654, 2443005; 440774, 2442966; 440769, 2442939; 440862, 2442939; 440988,

2442955; 441059, 2442994; 441141, 2442906; 441207, 2442829; 441306, 2442758; 441415, 2442720; 441651, 2442720; 441810, 2442742; 441908, 2442758; 441968, 2442736; 441996, 2442659; 442111, 2442621; 442341, 2442555; 442434, 2442539; 442598, 2442544; 442659, 2442522; 442659, 2442513; 442735, 2442462; 442779, 2442358; 442757, 2442249; 442757, 2442216; 442763, 2442183; 442752, 2442134; 442697, 2442117; 442675, 2442073; 442708, 2442051; 442768, 2442068; 442796, 2442040; 442850, 2441964; 442933, 2441947; 442987, 2441865; 442987, 2441794; 442954, 2441761; 442883, 2441745; 442779, 2441750; 442719, 2441772; 442681, 2441756; 442681, 2441717; 442730,

2441663; 442812, 2441624; 442823, 2441586; 442812, 2441526; 442856, 2441482; 442916, 2441455; 442954, 2441378; 442982, 2441350; 442631, 2441285; 442287, 2441225; 441900, 2441576; 441842, 2441576; 441832, 2441635; 441804, 2441674; 441733, 2441718; 441667, 2441761; 441651, 2441800; 441519, 2441794; 441251, 2441745; 440977, 2441625; 440917, 2441537; 440884, 2441477; 440725, 2441411; 440511, 2441367; 440265, 2441329; 440194, 2441307; 440018, 2441214; 439892, 2441132; 439761, 2441044; 439553, 2440946; 439492, 2440924; 439405, 2440902; 439076, 2441910; 439120, 2441932; return to starting point.

(B) Note: Map 185 follows:



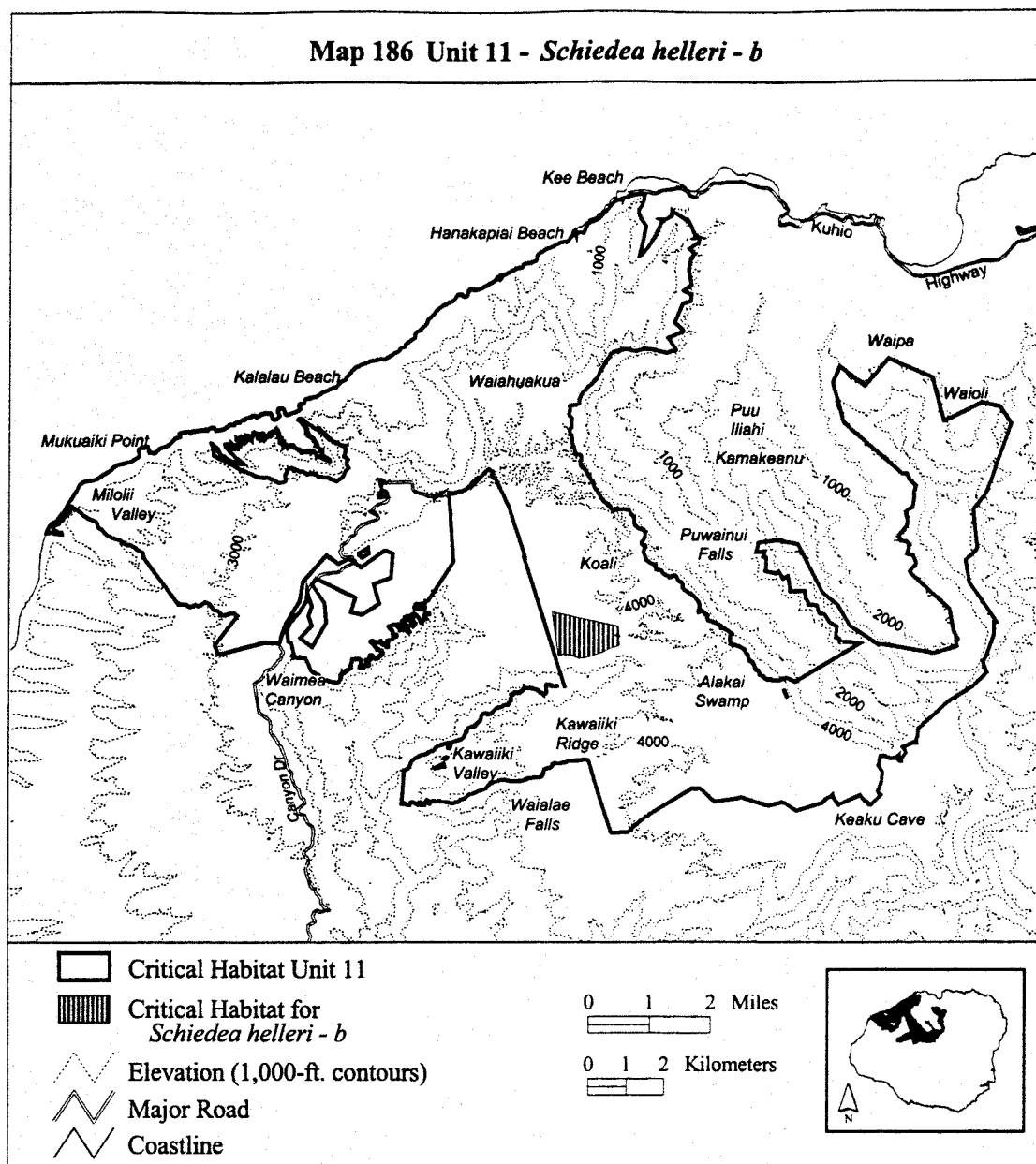
(clxxxvi) Kauai 11—*Schiedea helleri*—b
(154 ha; 381 ac)

(A) Unit consists of the following 13
boundary points: Start at 437970,

2446232; 439724, 2445859; 439747,
2445326; 439471, 2445259; 439401,
2445208; 439351, 2445174; 438983,
2445051; 438803, 2445014; 438673,

2445016; 438448, 2445099; 438225,
2445106; 438147, 2445051; 438140,
2445049; return to starting point.

(B) Note: Map 186 follows:



(clxxxvii) Kauai 11—*Schiedea helleri*—
c (172 ha; 426 ac)

(A) Unit consists of the following 97
boundary points: Start at 437937,

2443749; 437924, 2443901; 437955,
2444013; 437973, 2444102; 437928,
2444227; 437902, 2444298; 437911,
2444303; 438000, 2444267; 438085,
2444267; 438156, 2444280; 438326,
2444213; 438348, 2444222; 438384,
2444240; 438455, 2444396; 438625,
2444450; 438696, 2444419; 438799,
2444334; 438946, 2444334; 439013,

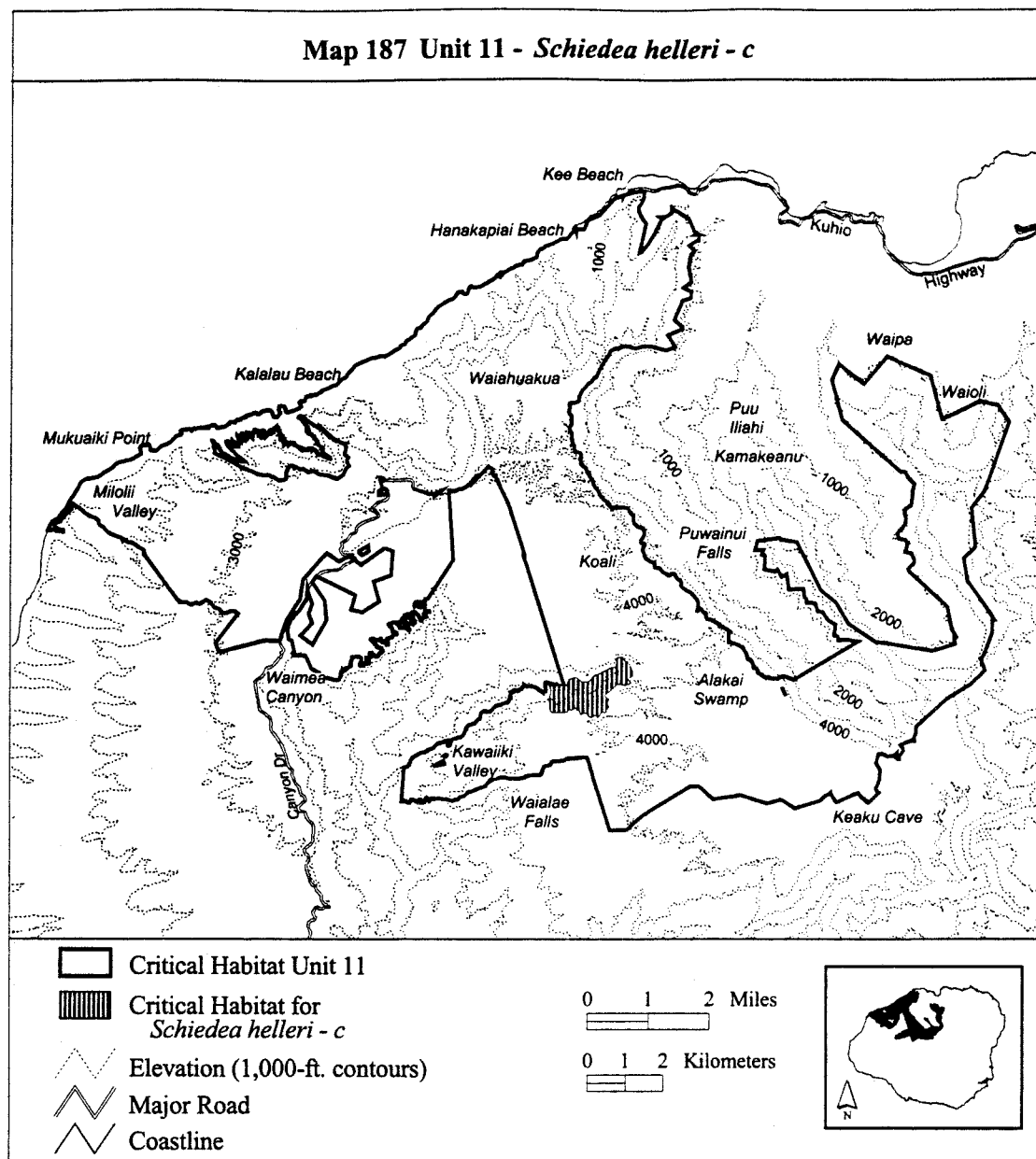
2444356; 439080, 2444450; 439129,
2444494; 439250, 2444539; 439326,
2444579; 439402, 2444619; 439540,
2444686; 439678, 2444726; 439710,
2444829; 439705, 2444936; 439759,
2444985; 439857, 2445003; 439897,
2444931; 439919, 2444896; 440004,
2444860; 440058, 2444753; 440107,
2444668; 440138, 2444623; 440143,
2444574; 440143, 2444539; 440143,
2444476; 440071, 2444445; 440018,
2444405; 440018, 2444374; 440067,
2444351; 440080, 2444302; 440058,

2444275; 439928, 2444231; 439830,
2444271; 439750, 2444267; 439678,
2444222; 439607, 2444137; 439495,
2444057; 439428, 2444008; 439415,
2443959; 439464, 2443887; 439500,
2443878; 439518, 2443861; 439486,
2443843; 439486, 2443812; 439477,
2443771; 439464, 2443770; 439500,
2443655; 439473, 2443620; 439446,
2443588; 439446, 2443539; 439428,
2443513; 439312, 2443513; 439294,
2443508; 439268, 2443450; 439241,
2443401; 439210, 2443392; 439187,

2443441; 439125, 2443441; 439067,
2443397; 439035, 2443392; 438955,
2443455; 438946, 2443486; 438919,
2443508; 438852, 2443499; 438803,
2443468; 438754, 2443481; 438750,

2443504; 438745, 2443544; 438719,
2443575; 438669, 2443575; 438669,
2443624; 438620, 2443647; 438585,
2443638; 438544, 2443602; 438473,
2443598; 438442, 2443593; 438415,

2443535; 438308, 2443513; 438085,
2443522; 438009, 2443526; 437955,
2443571; 437933, 2443665; 437940,
2443749; return to starting point.
(B) Note: Map 187 follows:

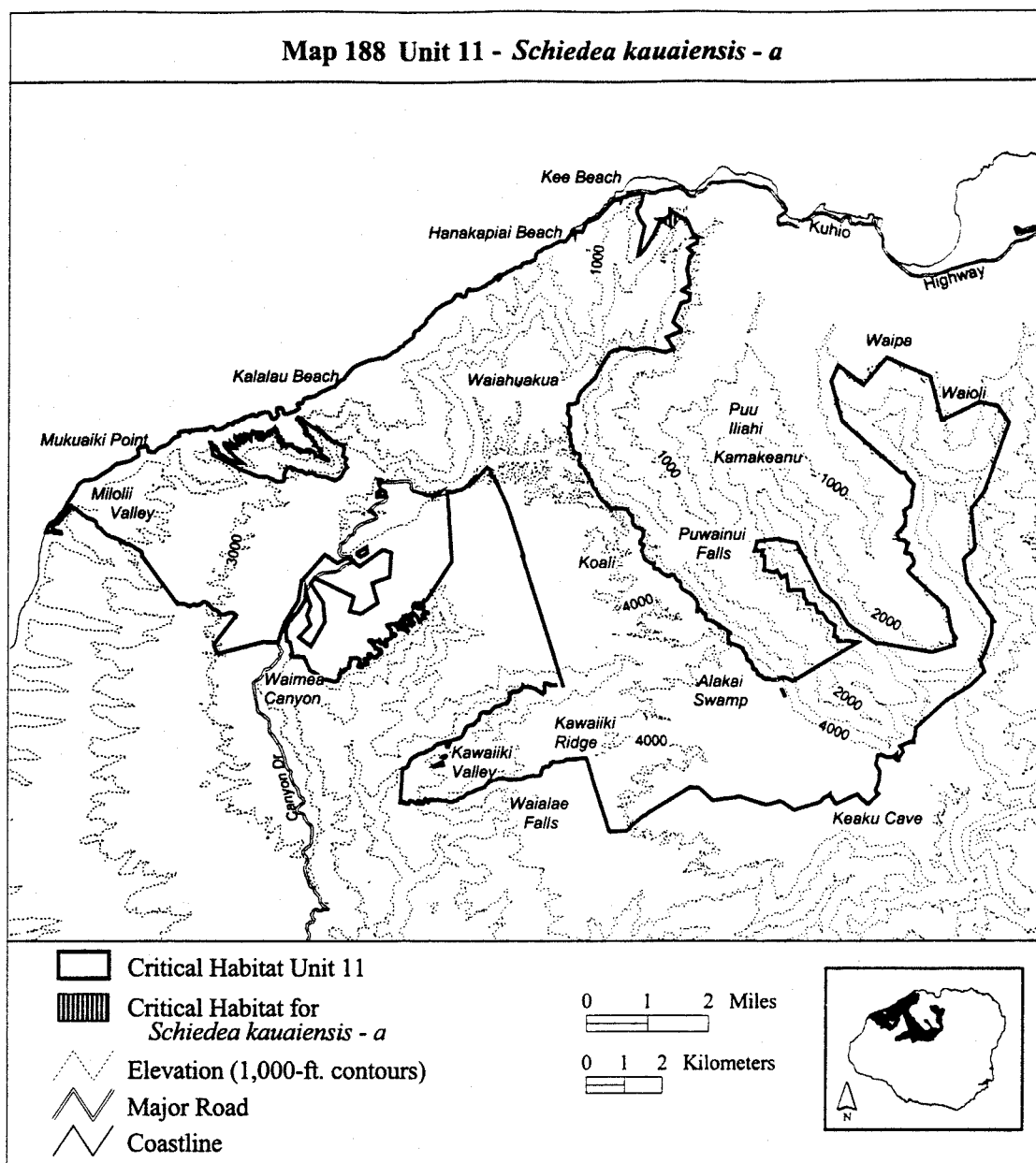


(clxxxviii) Kauai 11—*Schiedea kauaiensis*—a (12 ha; 29 ac)

(A) Unit consists of the following 7 boundary points: Start at 441158,

2456345; 440802, 2456603; 441024,
2456625; 441109, 2456674; 441096,
2456831; 441096, 2456842; 441384,
2456663; return to starting point.

(B) Note: Map 188 follows:



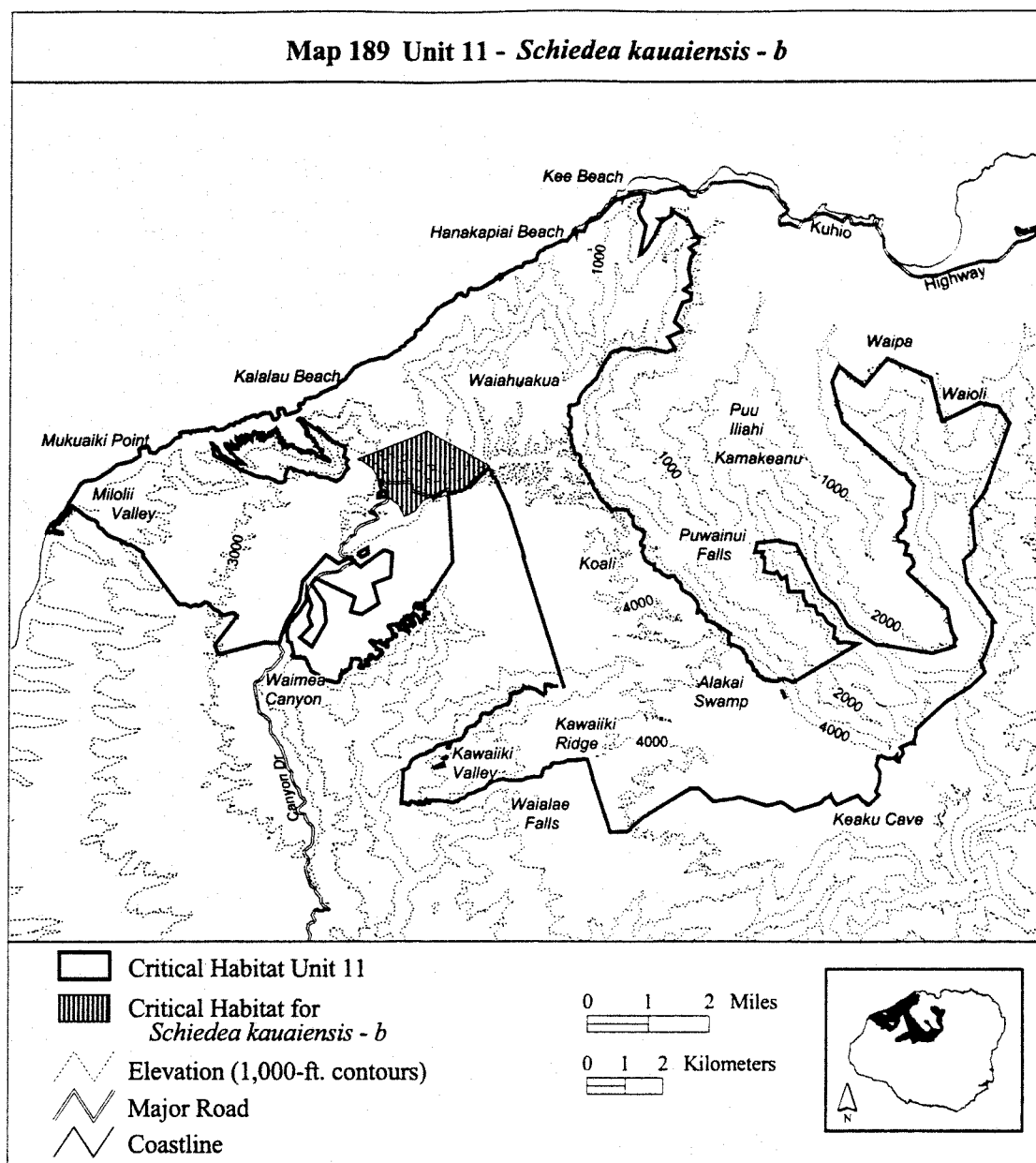
(clxxxix) Kauai 11—*Schiedea kauaiensis*—b (394 ha; 974 ac)

(A) Unit consists of the following 47 boundary points: Start at 434833, 2449278; 434824, 2449275; 434569, 2449182; 434357, 2448899; 434343, 2448881; 434145, 2448778; 434076, 2448743; 434061, 2448769; 433970, 2448925; 433903, 2449067; 433746,

2449177; 433650, 2449258; 433659, 2449418; 433575, 2449511; 433473, 2449595; 433461, 2449623; 433480, 2449629; 433484, 2449703; 433460, 2449707; 433443, 2449707; 433442, 2449724; 433348, 2449773; 433304, 2449883; 433184, 2450065; 433006, 2450176; 432940, 2450230; 432816, 2450278; 433712, 2450629; 434347, 2450868; 434676, 2451014; 434924,

2450872; 435714, 2450443; 436323, 2450091; 436203, 2450009; 436203, 2450009; 436201, 2450007; 436194, 2450002; 435573, 2449422; 435549, 2449426; 435517, 2449423; 435501, 2449420; 435498, 2449418; 435177, 2449404; 435010, 2449343; 435011, 2449352; 434881, 2449297; 434833, 2449281; return to starting point.

(B) **Note:** Map 189 follows:



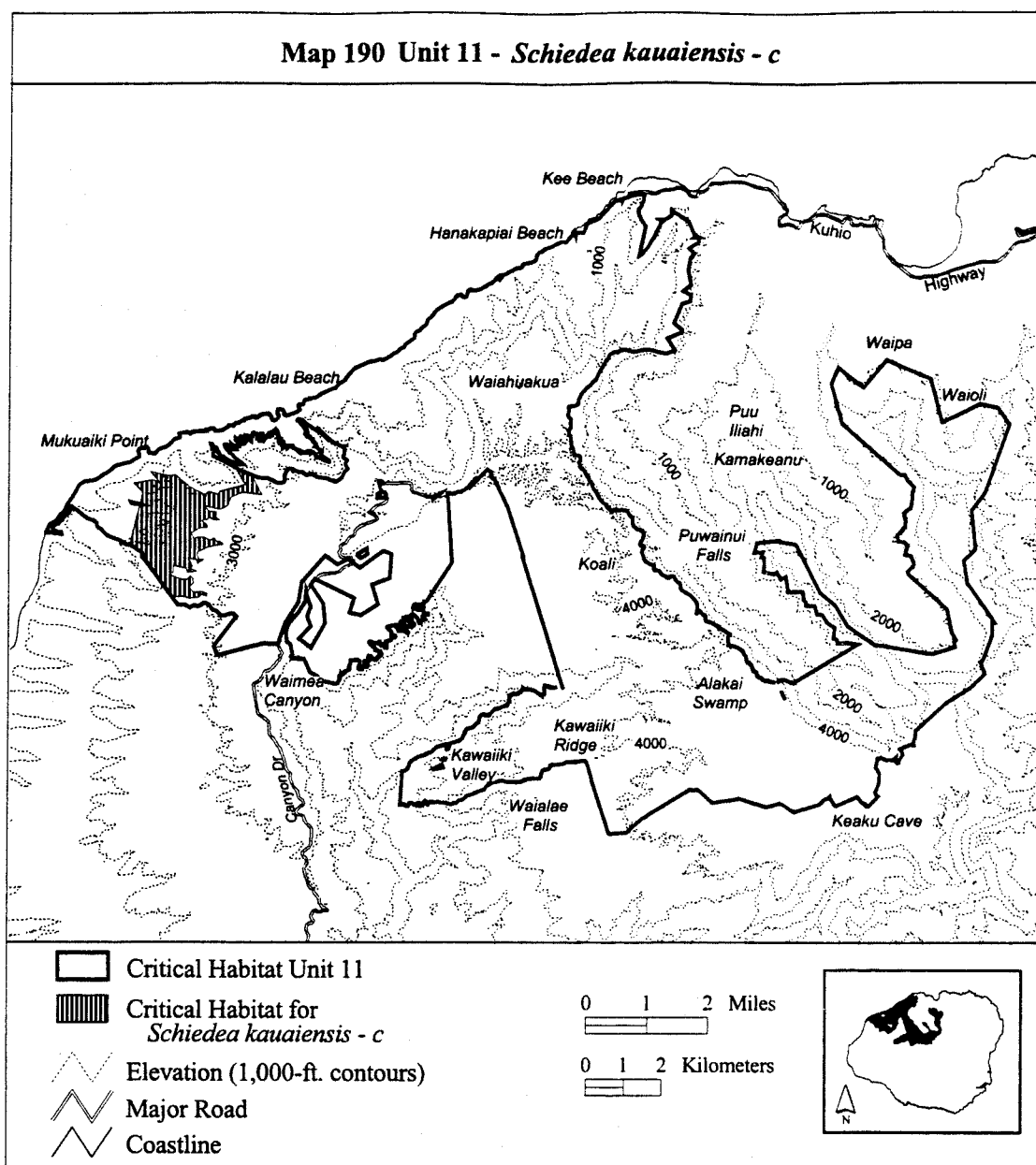
(cxc) Kauai 11—*Schiedea kauaiensis*—c
(510 ha; 1,260 ac)

(A) Unit consists of the following 110 boundary points: Start at 426811, 2448002; 427169, 2449411; 426941, 2449644; 427428, 2449744; 427602, 2449670; 427375, 2449950; 427862, 2449850; 428025, 2449872; 428417, 2449538; 428792, 2449348; 428919, 2449417; 429157, 2449343; 429189, 2449432; 429866, 2449617; 429586, 2450082; 429598, 2450077; 429717, 2449996; 429751, 2449978; 429791, 2449963; 429830, 2449956; 429860, 2449947; 429944, 2449910; 429968, 2449904; 430016, 2449884; 430027, 2449878; 430300, 2449348; 429803, 2449411; 429501, 2449279; 429411, 2449047; 429231, 2448941; 428781,

2449052; 428877, 2448948; 428940, 2448908; 429100, 2448884; 429100, 2448820; 429084, 2448749; 429180, 2448669; 429044, 2448677; 428925, 2448749; 428861, 2448677; 428805, 2448685; 428717, 2448637; 428837, 2448565; 428877, 2448470; 428725, 2448462; 428653, 2448462; 428454, 2448318; 428502, 2448174; 428597, 2448198; 428789, 2448214; 428932, 2448119; 429060, 2448182; 429124, 2448087; 429204, 2448095; 429292, 2448023; 429156, 2448007; 428901, 2447951; 428725, 2447863; 428613, 2447816; 428597, 2447736; 428661, 2447616; 428773, 2447616; 428621, 2447520; 428581, 2447624; 428374, 2447648; 428478, 2447465; 428446, 2447369; 428589, 2447313; 428350,

2447281; 428310, 2447393; 427967, 2447465; 427975, 2447369; 427967, 2447289; 427895, 2447289; 427951, 2447186; 428198, 2447098; 428358, 2447098; 428438, 2447193; 428510, 2447122; 428494, 2447098; 428510, 2446994; 428398, 2446906; 428502, 2446755; 428733, 2446787; 428877, 2446723; 428861, 2446667; 428741, 2446707; 428653, 2446635; 428382, 2446595; 428246, 2446651; 427959, 2446635; 427952, 2446615; 427185, 2447661; 427161, 2447669; 427157, 2447676; 427157, 2447711; 427175, 2447754; 427176, 2447775; 427171, 2447800; 427160, 2447815; 427124, 2447837; 427084, 2447847; 427039, 2447867; 426997, 2447892; 426981, 2447902; 426958, 2447923; 426944,

2447941; 426907, 2447965; 426847,

2447992; 426819, 2447998; return to
starting point.(B) **Note:** Map 190 follows:

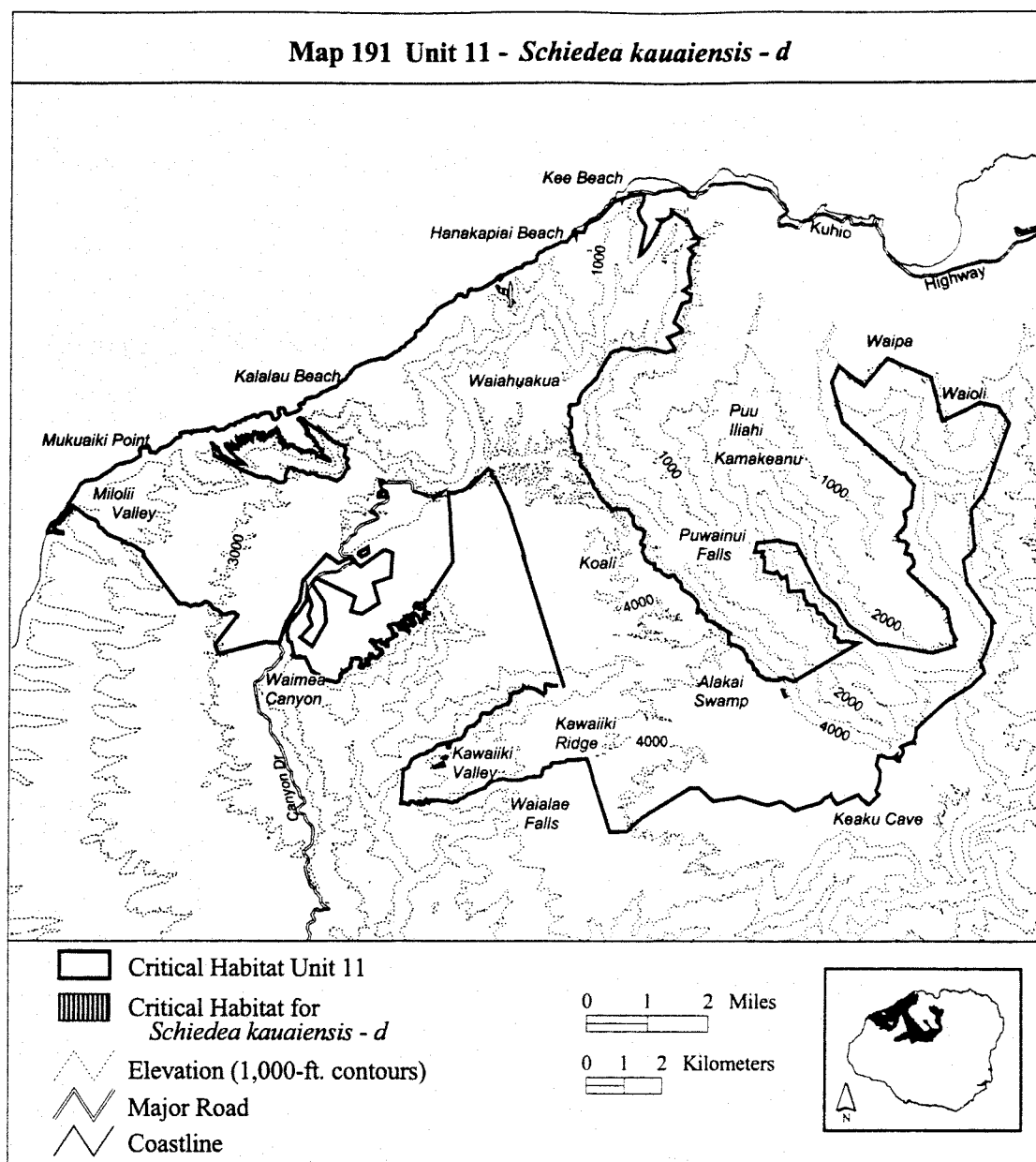
(cxc) Kauai 11—*Schiedea kauaiensis*—
d (11 ha; 28 ac)

(A) Unit consists of the following 39
boundary points: Start at 436481,
2454892; 436554, 2454840; 436578,
2454805; 436650, 2454788; 436692,
2454795; 436761, 2454736; 436782,
2454761; 436806, 2454757; 436823,

2454836; 436816, 2454895; 436834,
2454968; 436858, 2454971; 436858,
2454912; 436906, 2454847; 436899,
2454633; 436896, 2454554; 436889,
2454509; 436927, 2454474; 437006,
2454412; 437006, 2454395; 436920,
2454384; 436896, 2454298; 436875,
2454271; 436854, 2454271; 436840,
2454322; 436834, 2454426; 436834,

2454485; 436809, 2454523; 436764,
2454567; 436733, 2454616; 436685,
2454619; 436654, 2454619; 436619,
2454650; 436581, 2454681; 436530,
2454688; 436505, 2454737; 436485,
2454781; 436457, 2454833; 436457,
2454861; return to starting point.

(B) **Note:** Map 191 follows:



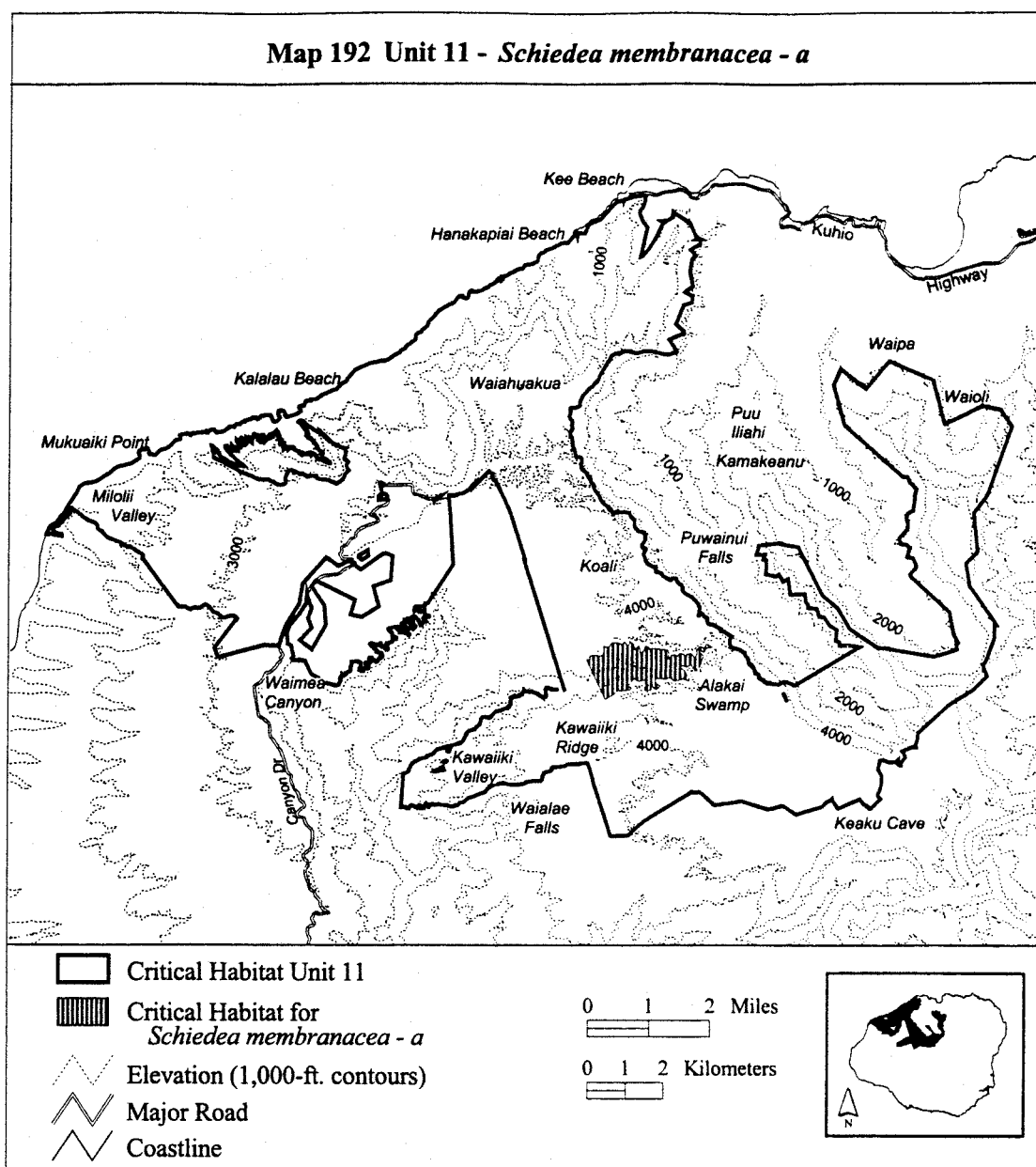
(cxcii) Kauai 11—*Schiedea membranacea*—a (251 ha; 620 ac)

(A) Unit consists of the following 85 boundary points: Start at 439181, 2445148; 439301, 2445148; 439351, 2445232; 439351, 2445395; 439471, 2445366; 439563, 2445479; 439711, 2445479; 439817, 2445437; 439895, 2445501; 439951, 2445409; 440008, 2445430; 440022, 2445515; 440128, 2445458; 440149, 2445310; 440269, 2445402; 440312, 2445218; 440404, 2445267; 440439, 2445409; 440517, 2445373; 440545, 2445317; 440623, 2445352; 441025, 2445302; 441054, 2445211; 441018, 2445055; 441145,

2445161; 441216, 2445175; 441280, 2445140; 441372, 2445225; 441527, 2445133; 441527, 2445196; 441647, 2445210; 441746, 2445083; 441796, 2445203; 441788, 2445309; 441894, 2445387; 441979, 2445345; 442057, 2445465; 442198, 2445373; 442057, 2445359; 441993, 2445246; 441894, 2445295; 441866, 2445253; 441951, 2445182; 441951, 2445104; 441880, 2444878; 441803, 2444780; 441739, 2444787; 441640, 2444914; 441548, 2444857; 441400, 2444893; 441357, 2444857; 441485, 2444751; 441612, 2444547; 441591, 2444490; 441442, 2444554; 441343, 2444504; 441188,

2444490; 441117, 2444582; 440969, 2444533; 440714, 2444554; 440714, 2444434; 440835, 2444363; 440736, 2444264; 440594, 2444377; 440594, 2444250; 440432, 2444243; 440432, 2444321; 440531, 2444392; 440446, 2444406; 440446, 2444519; 440283, 2444483; 440142, 2444554; 440057, 2444420; 439980, 2444378; 440078, 2444300; 440022, 2444243; 439874, 2444229; 439704, 2444236; 439640, 2444145; 439492, 2444074; 439400, 2444003; 438884, 2445049; 438983, 2445042; 438983, 2445141; 439139, 2445169; return to starting point.

(B) Note: Map 192 follows:



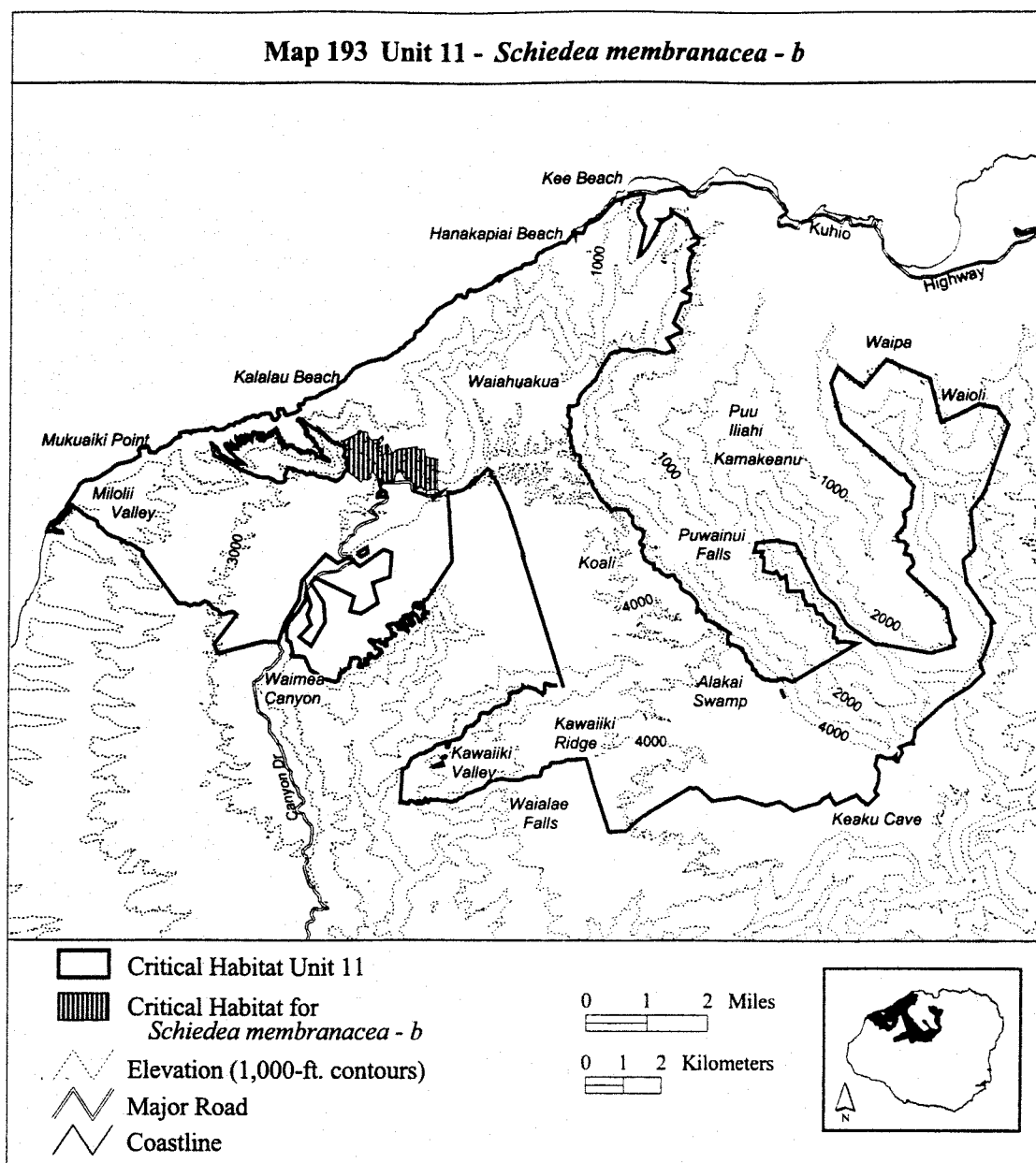
(cxciii) Kauai 11—*Schiedea membranacea*—b (234 ha; 579 ac)

(A) Unit consists of the following 73 boundary points: Start at 432751, 2449809; 432525, 2449982; 432579, 2450036; 432551, 2450083; 432523, 2450130; 432523, 2450182; 432565, 2450262; 432523, 2450304; 432475, 2450313; 432452, 2450337; 432461, 2450375; 432480, 2450426; 432490, 2450478; 432501, 2450529; 432494, 2450543; 432477, 2450580; 432468, 2450593; 432464, 2450611; 432465, 2450623; 432450, 2450624; 432408,

2450635; 432380, 2450644; 432335, 2450666; 432306, 2450682; 432952, 2451018; 433092, 2450986; 433100, 2450920; 433191, 2450796; 433323, 2450788; 433380, 2450813; 433471, 2450895; 433528, 2450805; 433397, 2450640; 433372, 2450550; 433495, 2450640; 433479, 2450443; 433495, 2450369; 433569, 2450435; 433561, 2450632; 433635, 2450681; 433685, 2450566; 433750, 2450410; 433849, 2450517; 434162, 2450566; 434401, 2450615; 434425, 2450525; 434606, 2450525; 434639, 2450327; 434952,

2450270; 434952, 2449497; 434968, 2449447; 434812, 2449447; 434688, 2449421; 434573, 2449489; 434461, 2449513; 434354, 2449390; 434322, 2449449; 434310, 2449628; 434251, 2449664; 434076, 2449767; 433964, 2449950; 433873, 2449910; 433808, 2449826; 433817, 2449668; 433535, 2449656; 433372, 2449777; 433285, 2449871; 433199, 2449958; 433166, 2449867; 433183, 2449769; 433094, 2449708; 432985, 2449744; 432952, 2449654; return to starting point.

(B) **Note:** Map 193 follows:



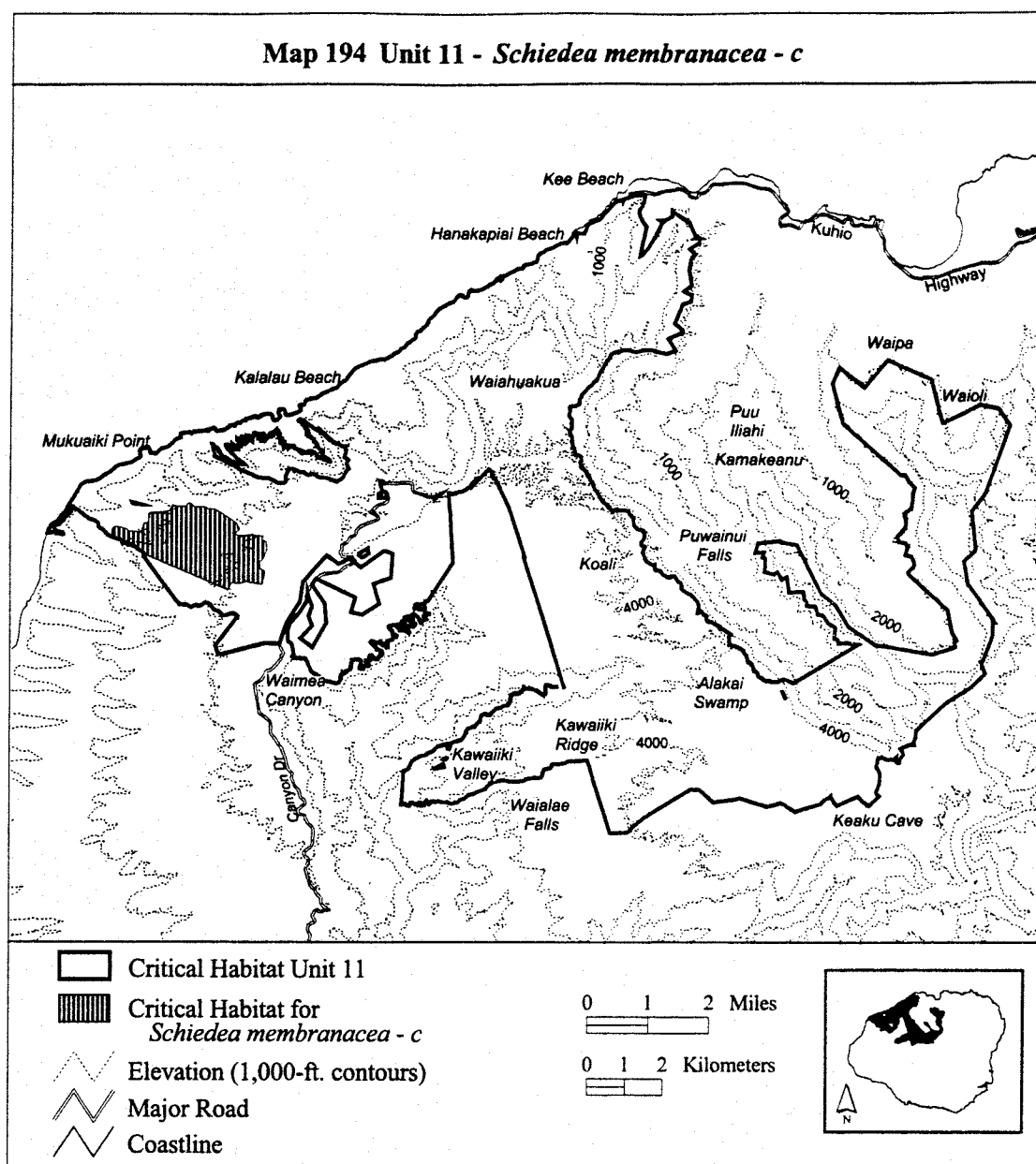
(cxciv) Kauai 11—*Schiedea membranacea*—c (527 ha; 1,303 ac)

(A) Unit consists of the following 95 boundary points: Start at 429500, 2447004; 429408, 2446809; 427175, 2447761; 427176, 2447775; 427171, 2447800; 427160, 2447815; 427124, 2447837; 427084, 2447847; 427039, 2447867; 427014, 2447882; 427019, 2447905; 426996, 2447928; 426906, 2448039; 426874, 2448050; 426752, 2448039; 426667, 2448060; 426648, 2448068; 426613, 2448093; 426561, 2448116; 426560, 2448116; 426491, 2448177; 426375, 2448225; 426316, 2448252; 426316, 2448342; 426321, 2448427; 426380, 2448475; 426438,

2448496; 426550, 2448475; 426699, 2448421; 426784, 2448374; 427049, 2448347; 427102, 2448379; 427166, 2448575; 427170, 2448577; 427171, 2448582; 427181, 2448581; 427241, 2448602; 427288, 2448618; 427294, 2448767; 427288, 2448830; 427368, 2448873; 427655, 2448889; 427830, 2448915; 427873, 2448968; 427899, 2449027; 427979, 2449048; 428059, 2449037; 428106, 2449027; 428282, 2449032; 428335, 2449117; 428377, 2449133; 428415, 2449101; 428478, 2449037; 428537, 2449006; 428670, 2449006; 428755, 2449021; 428824, 2448995; 428845, 2448968; 428999, 2448968; 429063, 2448942; 429350, 2448766; 429514, 2448660; 429642,

2448549; 429690, 2448432; 429658, 2448384; 429589, 2448336; 429605, 2448283; 429769, 2448246; 429844, 2448257; 430024, 2448283; 430088, 2448283; 430120, 2448235; 430152, 2448235; 430184, 2448257; 430322, 2448225; 430295, 2448166; 430290, 2448140; 430391, 2448092; 430412, 2447906; 430412, 2447848; 430348, 2447747; 430322, 2447657; 430258, 2447588; 430232, 2447529; 430237, 2447396; 430354, 2447317; 430348, 2447221; 430295, 2446966; 430242, 2446961; 430093, 2446998; 429977, 2447014; 429881, 2447041; 429764, 2446993; 429647, 2446982; 429514, 2447003; return to starting point.

(B) Note: Map 194 follows:



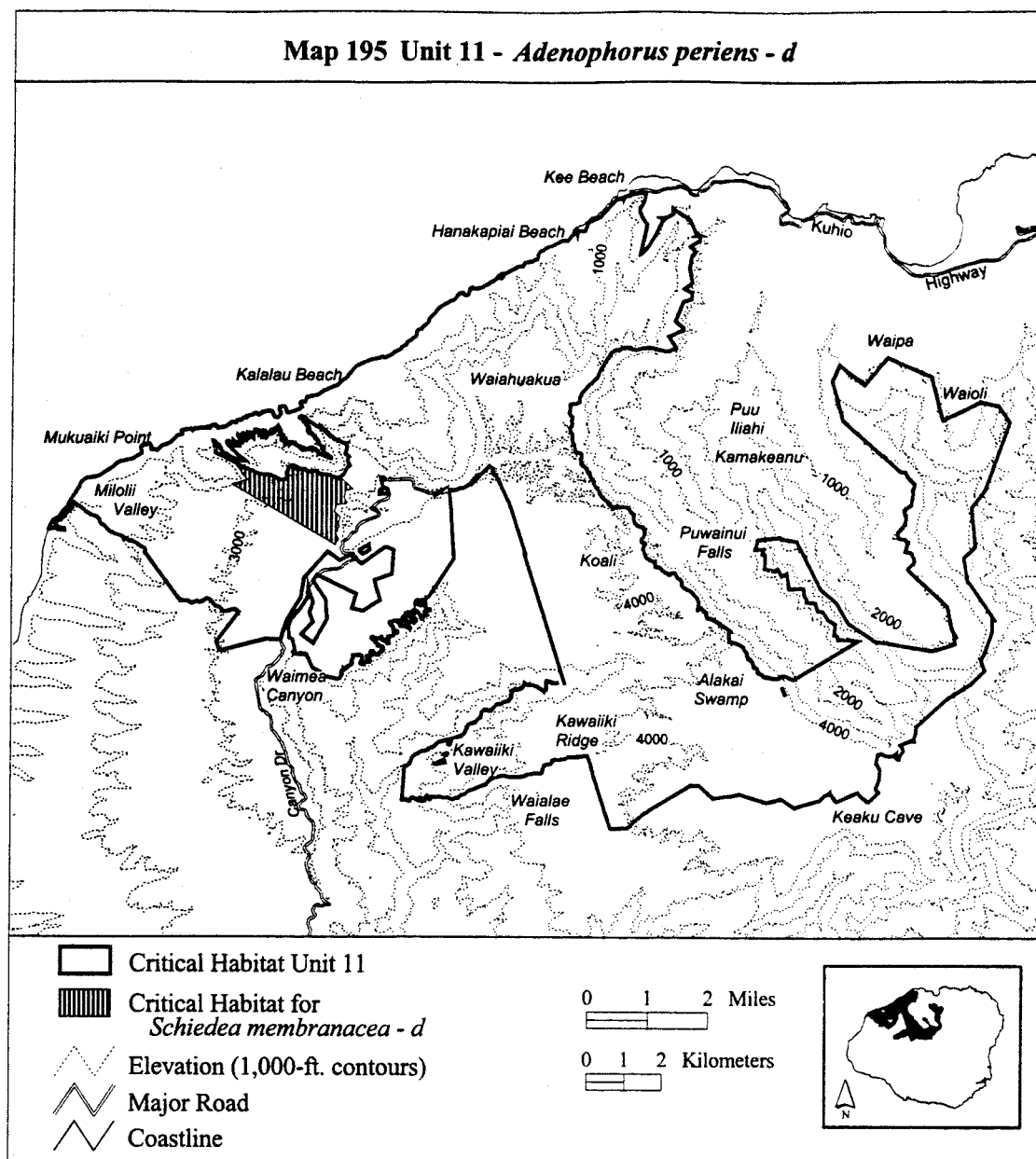
(cxcv) Kauai 11—*Schiedea membranacea*—d (327 ha; 809 ac)

(A) Unit consists of the following 78 boundary points: Start at 430406, 2449796; 430471, 2449787; 430527, 2449754; 430583, 2449736; 430635, 2449693; 430696, 2449656; 430720, 2449646; 430819, 2449646; 430899, 2449674; 430918, 2449717; 430904, 2449834; 430927, 2449905; 430955, 2449985; 430993, 2450032; 431068, 2450041; 431153, 2450008; 431238, 2449970; 431285, 2449942; 431360, 2449956; 431449, 2449886; 431497, 2449867; 431605, 2449895; 431657,

2449890; 431699, 2449876; 431765, 2449810; 431864, 2449801; 431981, 2449792; 432047, 2449787; 432113, 2449740; 432217, 2449712; 432259, 2449679; 432313, 2449721; 432664, 2449391; 432475, 2449358; 432426, 2449177; 432475, 2449062; 432514, 2449029; 432472, 2448986; 432450, 2448988; 432236, 2448980; 432162, 2448799; 432230, 2448747; 432226, 2448740; 432334, 2448663; 432269, 2448470; 432310, 2448387; 432261, 2448338; 432261, 2448264; 432220, 2448239; 432228, 2448165; 432286, 2448050; 432228, 2447976; 432212,

2447910; 429447, 2449531; 429866, 2449654; 429710, 2449811; 429644, 2449942; 429480, 2450139; 429489, 2450138; 429576, 2450092; 429717, 2449996; 429751, 2449978; 429791, 2449963; 429830, 2449956; 429860, 2449947; 429944, 2449910; 429968, 2449904; 430016, 2449884; 430068, 2449856; 430172, 2449815; 430207, 2449804; 430261, 2449795; 430317, 2449781; 430340, 2449778; 430365, 2449787; 430392, 2449798; 430408, 2449802; 430410, 2449802; return to starting point.

(B) **Note:** Map 195 follows:



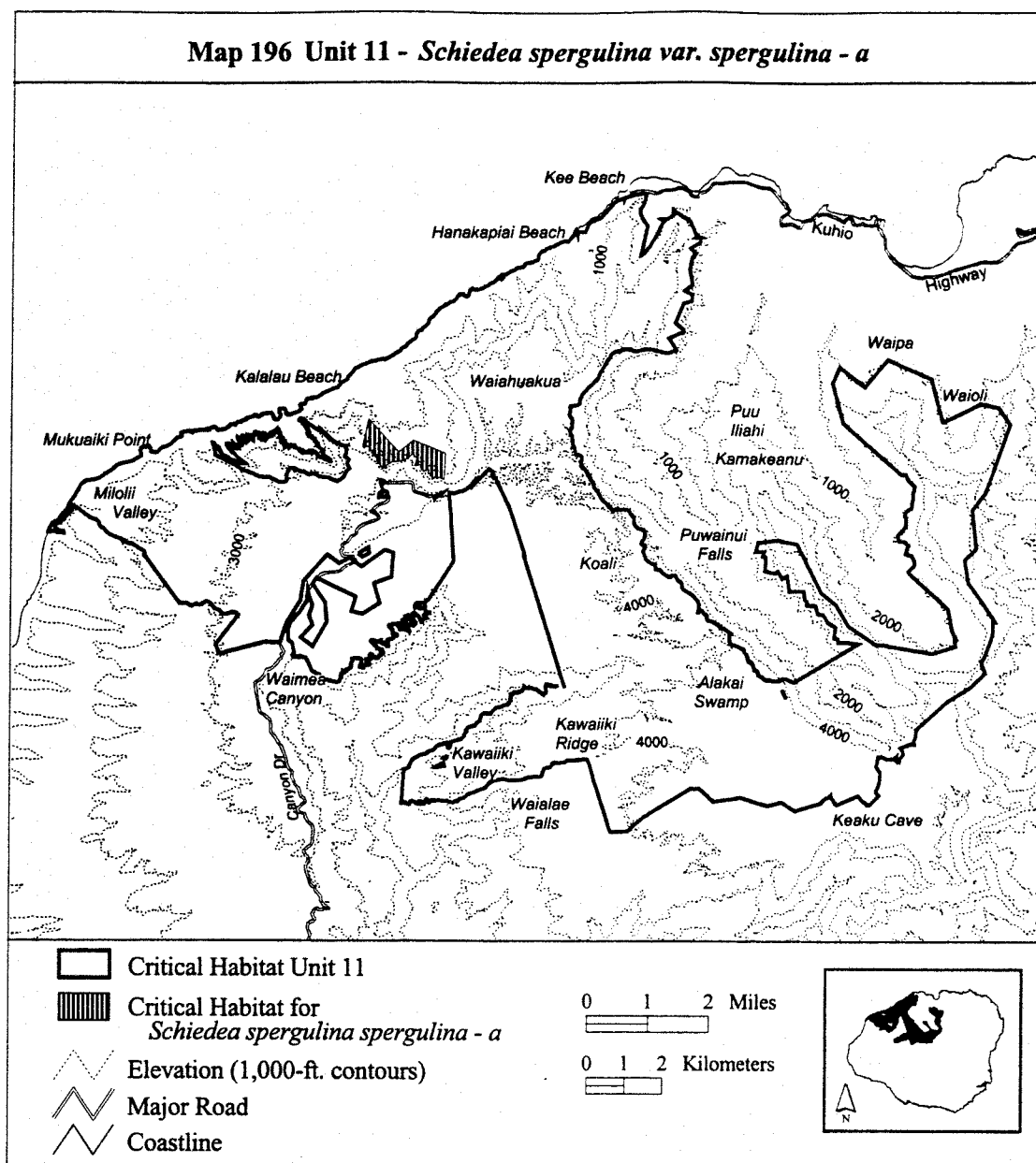
(cxcvi) Kauai 11—*Schiedea spergulina* var. *spergulina*—a (131 ha; 323 ac)

(A) Unit consists of the following 48 boundary points: Start at 432924, 2450644; 433080, 2451343; 433887, 2450474; 434285, 2450789; 435124, 2450447; 435088, 2449734; 434974, 2449796; 434896, 2449749; 434891, 2449796; 434850, 2449796; 434777, 2449718; 434777, 2449827; 434731,

2449827; 434725, 2449889; 434663, 2449889; 434684, 2449998; 434534, 2449951; 434534, 2450013; 434524, 2450039; 434482, 2450018; 434472, 2450096; 434441, 2450132; 434368, 2450101; 434317, 2450106; 434379, 2450323; 434291, 2450354; 434296, 2450396; 434260, 2450432; 434027, 2450241; 433706, 2450194; 433556, 2450112; 433571, 2450029; 433494,

2450050; 433411, 2450070; 433302, 2450251; 433338, 2450303; 433276, 2450298; 433266, 2450344; 433312, 2450365; 433307, 2450391; 433178, 2450355; 433240, 2450463; 433162, 2450448; 433183, 2450500; 433080, 2450489; 433111, 2450593; 433028, 2450629; 432955, 2450557; return to starting point.

(B) **Note:** Map 196 follows:



(cxcvii) Kauai 11—*Schiedea spergulina* var. *spergulina*—b (78 ha; 191 ac)

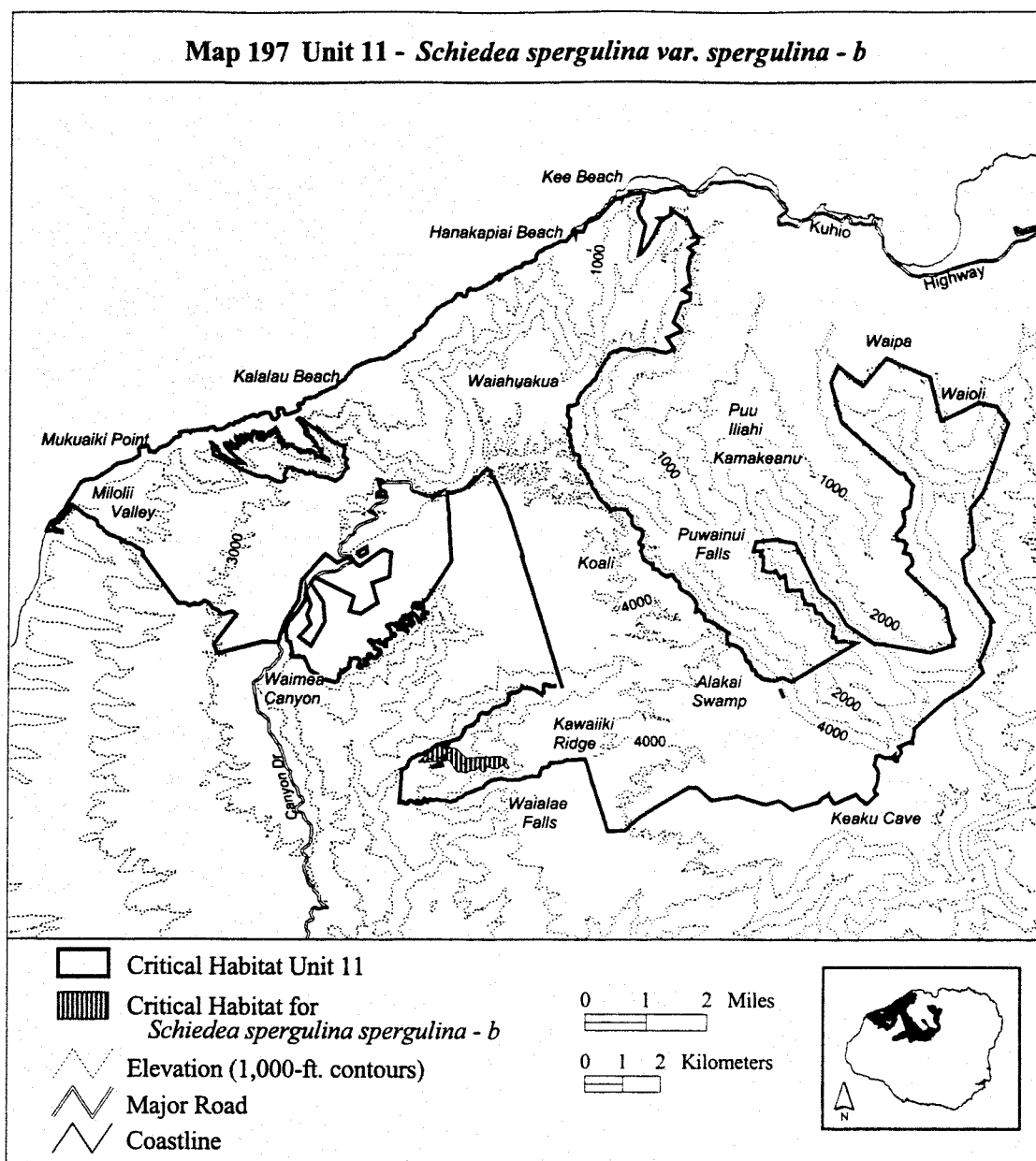
(A) Unit consists of the following 27 boundary points: Start at 435290, 2442650; 435520, 2442618; 435796, 2442364; 436701, 2442400; 436882, 2442335; 436853, 2442241; 436940, 2442103; 436868, 2442082; 436752,

2442198; 436636, 2442089; 436506, 2442082; 436332, 2442154; 436303, 2441988; 436223, 2441988; 436179, 2442031; 436122, 2442125; 436064, 2442053; 435911, 2442024; 435781, 2441966; 435658, 2441995; 435542, 2441995; 435346, 2442306; 434520, 2442249; 435006, 2442690; 435235,

2442658; 435237, 2442643; 435284, 2442631; return to starting point.

(B) Excluding 1 area bounded by the following 4 points (0 ha, 1 ac): Start at 435151, 2442425; 435215, 2442393; 435195, 2442353; 435128, 2442379; return to starting point.

(C) **Note:** Map 197 follows:



(cxcviii) Kauai 11—*Schiedea stellarioides*—a (1,260 ha; 3,112 ac)

(A) Unit consists of the following 568 boundary points: Start at 435336, 2442801; 435344, 2442802; 435367, 2442807; 435391, 2442814; 435415, 2442819; 435435, 2442826; 435454, 2442831; 435476, 2442838; 435496, 2442844; 435516, 2442850; 435530, 2442853; 435534, 2442855; 435543, 2442858; 435556, 2442862; 435571, 2442867; 435585, 2442876; 435598, 2442885; 435608, 2442891; 435619, 2442899; 435627, 2442904; 435642, 2442920; 435658, 2442932; 435668, 2442948; 435673, 2442959; 435681, 2442977; 435688, 2442995; 435693, 2443006; 435698, 2443024; 435704, 2443036; 435708, 2443047; 435715,

2443064; 435722, 2443078; 435725, 2443086; 435729, 2443093; 435735, 2443103; 435738, 2443112; 435743, 2443127; 435749, 2443138; 435753, 2443149; 435757, 2443155; 435766, 2443169; 435778, 2443179; 435790, 2443186; 435804, 2443188; 435821, 2443194; 435842, 2443199; 435861, 2443202; 435874, 2443204; 435889, 2443208; 435904, 2443211; 435933, 2443223; 435942, 2443232; 435949, 2443246; 435958, 2443255; 435969, 2443263; 435979, 2443271; 435993, 2443281; 436010, 2443297; 436032, 2443316; 436048, 2443332; 436064, 2443343; 436080, 2443358; 436089, 2443375; 436095, 2443390; 436100, 2443403; 436107, 2443421; 436113, 2443456; 436118, 2443477; 436123,

2443502; 436134, 2443520; 436146, 2443534; 436160, 2443543; 436175, 2443554; 436190, 2443560; 436213, 2443563; 436227, 2443563; 436240, 2443562; 436254, 2443557; 436265, 2443552; 436274, 2443547; 436287, 2443540; 436300, 2443537; 436315, 2443532; 436328, 2443529; 436337, 2443528; 436348, 2443531; 436357, 2443536; 436369, 2443546; 436380, 2443558; 436392, 2443572; 436403, 2443585; 436421, 2443611; 436438, 2443631; 436460, 2443655; 436478, 2443676; 436497, 2443688; 436518, 2443696; 436534, 2443700; 436558, 2443707; 436576, 2443711; 436597, 2443714; 436611, 2443716; 436630, 2443718; 436644, 2443720; 436655, 2443724; 436666, 2443731; 436678,

2443742; 436697, 2443756; 436708,
2443763; 436726, 2443769; 436745,
2443772; 436758, 2443775; 436771,
2443776; 436788, 2443776; 436799,
2443778; 436808, 2443781; 436818,
2443785; 436823, 2443786; 436829,
2443790; 436837, 2443797; 436841,
2443801; 436845, 2443807; 436852,
2443819; 436861, 2443831; 436870,
2443847; 436882, 2443863; 436890,
2443877; 436900, 2443900; 436911,
2443923; 436914, 2443936; 436914,
2443948; 436913, 2443962; 436910,
2443981; 436908, 2443995; 436908,
2444013; 436911, 2444027; 436918,
2444040; 436926, 2444047; 436933,
2444055; 436942, 2444065; 436951,
2444073; 436961, 2444084; 436969,
2444094; 436975, 2444098; 436983,
2444102; 436994, 2444107; 437009,
2444108; 437026, 2444105; 437049,
2444100; 437067, 2444092; 437076,
2444089; 437106, 2444090; 437119,
2444096; 437128, 2444104; 437133,
2444112; 437137, 2444122; 437144,
2444130; 437156, 2444135; 437169,
2444141; 437183, 2444150; 437191,
2444154; 437202, 2444165; 437212,
2444177; 437228, 2444198; 437239,
2444213; 437245, 2444227; 437254,
2444239; 437263, 2444246; 437278,
2444240; 437294, 2444234; 437310,
2444225; 437332, 2444217; 437351,
2444217; 437370, 2444223; 437391,
2444223; 437412, 2444226; 437428,
2444226; 437445, 2444223; 437462,
2444219; 437482, 2444211; 437497,
2444205; 437541, 2444190; 437563,
2444183; 437578, 2444179; 437593,
2444170; 437610, 2444160; 437624,
2444146; 437636, 2444132; 437651,
2444119; 437671, 2444112; 437691,
2444102; 437703, 2444093; 437722,
2444082; 437732, 2444069; 437749,
2444061; 437758, 2444058; 437768,
2444060; 437780, 2444066; 437810,
2444080; 437821, 2444088; 437831,
2444100; 437833, 2444111; 437835,
2444126; 437833, 2444139; 437827,
2444163; 437822, 2444185; 437820,
2444206; 437818, 2444236; 437824,
2444265; 437828, 2444292; 437836,
2444314; 437843, 2444322; 437854,
2444327; 437871, 2444328; 437887,
2444323; 437909, 2444314; 437933,
2444302; 437960, 2444289; 437984,
2444274; 438007, 2444260; 438028,
2444258; 438048, 2444258; 438072,
2444260; 438087, 2444266; 438109,
2444271; 438133, 2444273; 438164,
2444270; 438196, 2444263; 438335,
2444214; 438315, 2444274; 438323,
2444270; 438355, 2444421; 438442,
2444561; 438420, 2444670; 438420,
2444745; 438528, 2444864; 438680,
2444972; 438907, 2445004; 438907,
2445080; 438993, 2445145; 439156,
2445145; 439296, 2445177; 439339,
2445253; 439545, 2445491; 439783,
2445458; 440107, 2445318; 440150,
2445285; 440334, 2445307; 440410,
2445263; 440431, 2445231; 440594,
2445253; 440691, 2445339; 440756,
2445371; 440907, 2445317; 441048,
2445252; 441113, 2445242; 441221,
2445274; 441361, 2445306; 441513,
2445339; 441707, 2445328; 441848,
2445198; 442075, 2445112; 442053,
2445025; 441988, 2444906; 441891,
2444852; 441740, 2444744; 441664,
2444701; 441697, 2444582; 441740,
2444463; 441675, 2444420; 441513,
2444420; 441069, 2444453; 440626,
2444442; 440626, 2444356; 440723,
2444291; 440896, 2444193; 440886,
2444183; 440723, 2444204; 440410,
2444280; 440237, 2444258; 440161,
2444248; 440075, 2444183; 440075,
2444064; 440183, 2443988; 440280,
2443988; 440323, 2443902; 440356,
2443826; 440453, 2443772; 440486,
2443696; 440464, 2443653; 440291,
2443567; 440096, 2443577; 439934,
2443459; 439718, 2443415; 439523,
2443340; 439274, 2443340; 438961,
2443405; 438745, 2443480; 438582,
2443524; 438377, 2443491; 438269,
2443372; 438334, 2443189; 438485,
2443070; 438615, 2443081; 438669,
2443048; 438669, 2442929; 438701,
2442810; 438755, 2442745; 439069,
2442810; 439177, 2442702; 439177,
2442605; 439058, 2442486; 438961,
2442378; 438909, 2442349; 438866,
2442347; 438838, 2442340; 438821,
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2442329; 438704, 2442326; 438694,
2442327; 438679, 2442324; 438668,
2442322; 438637, 2442324; 438577,
2442315; 438561, 2442316; 438535,
2442314; 438523, 2442310; 438517,
2442310; 438496, 2442310; 438460,
2442320; 438453, 2442321; 438436,
2442321; 438433, 2442319; 438418,
2442311; 438392, 2442294; 438376,
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2441190; 434424, 2441176; 434397,
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2442532; 434755, 2442542; 434775,
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2442596; 434883, 2442613; 434896,
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2442668; 434949, 2442681; 434972,
2442699; 434986, 2442705; 434997,
2442708; 435006, 2442713; 435012,
2442717; 435026, 2442719; 435039,
2442722; 435061, 2442727; 435081,
2442733; 435100, 2442739; 435119,
2442747; 435135, 2442754; 435150,
2442764; 435164, 2442771; 435184,
2442774; 435201, 2442777; 435219,
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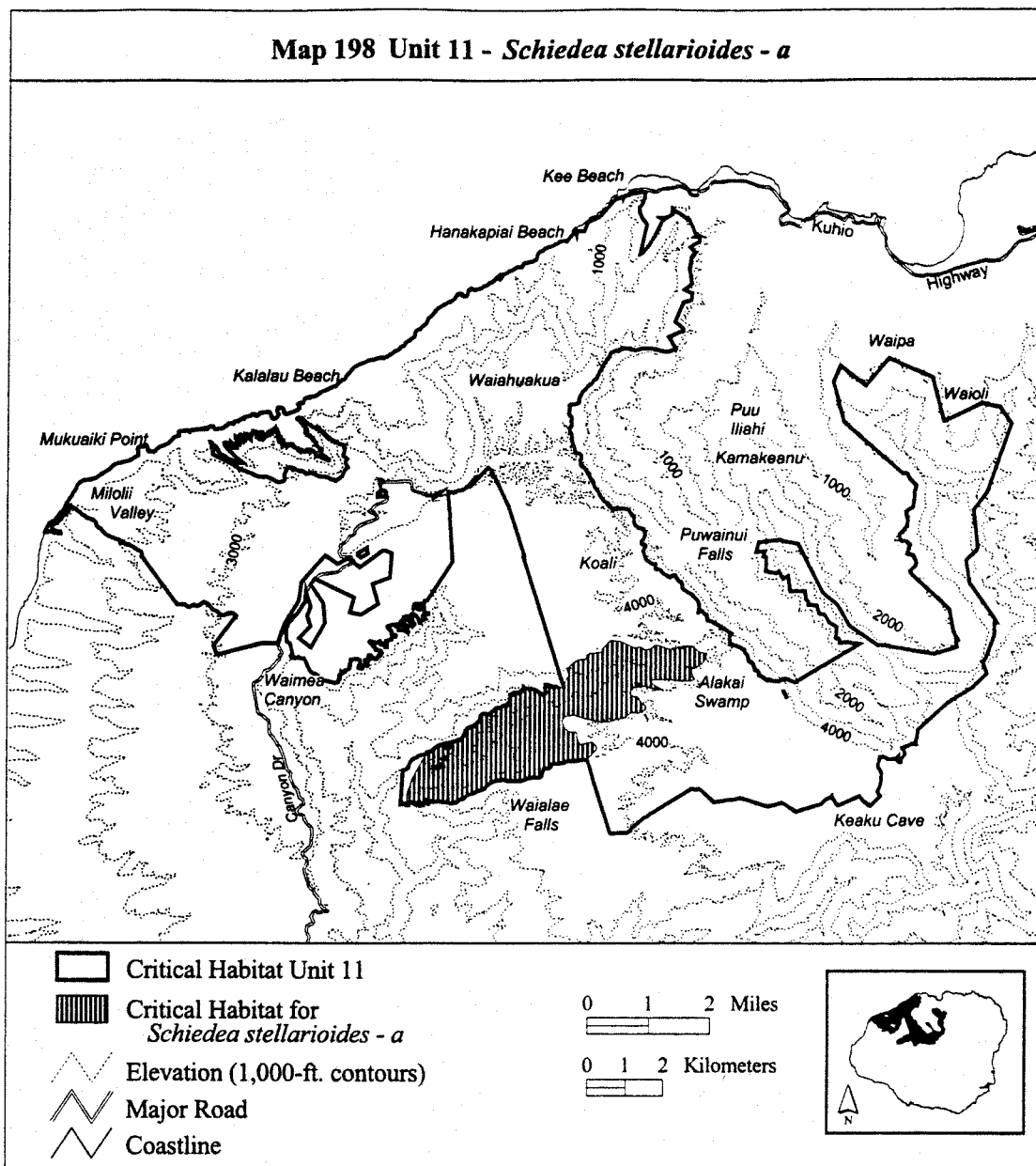
2442643; 435284, 2442631; return to
starting point.

(B) Excluding 2 areas:

(1) Bounded by the following 3 points
(1 ha; 3 ac): Start at 435132, 2442248;
435160, 2442164; 434848, 2442098;
return to starting point; and

(2) Bounded by the following 4 points
(0 ha; 1 ac): Start at 435151, 2442425;
435215, 2442393; 435195, 2442353;
435128, 2442379; return to starting
point.

(C) Note: Map 198 follows:



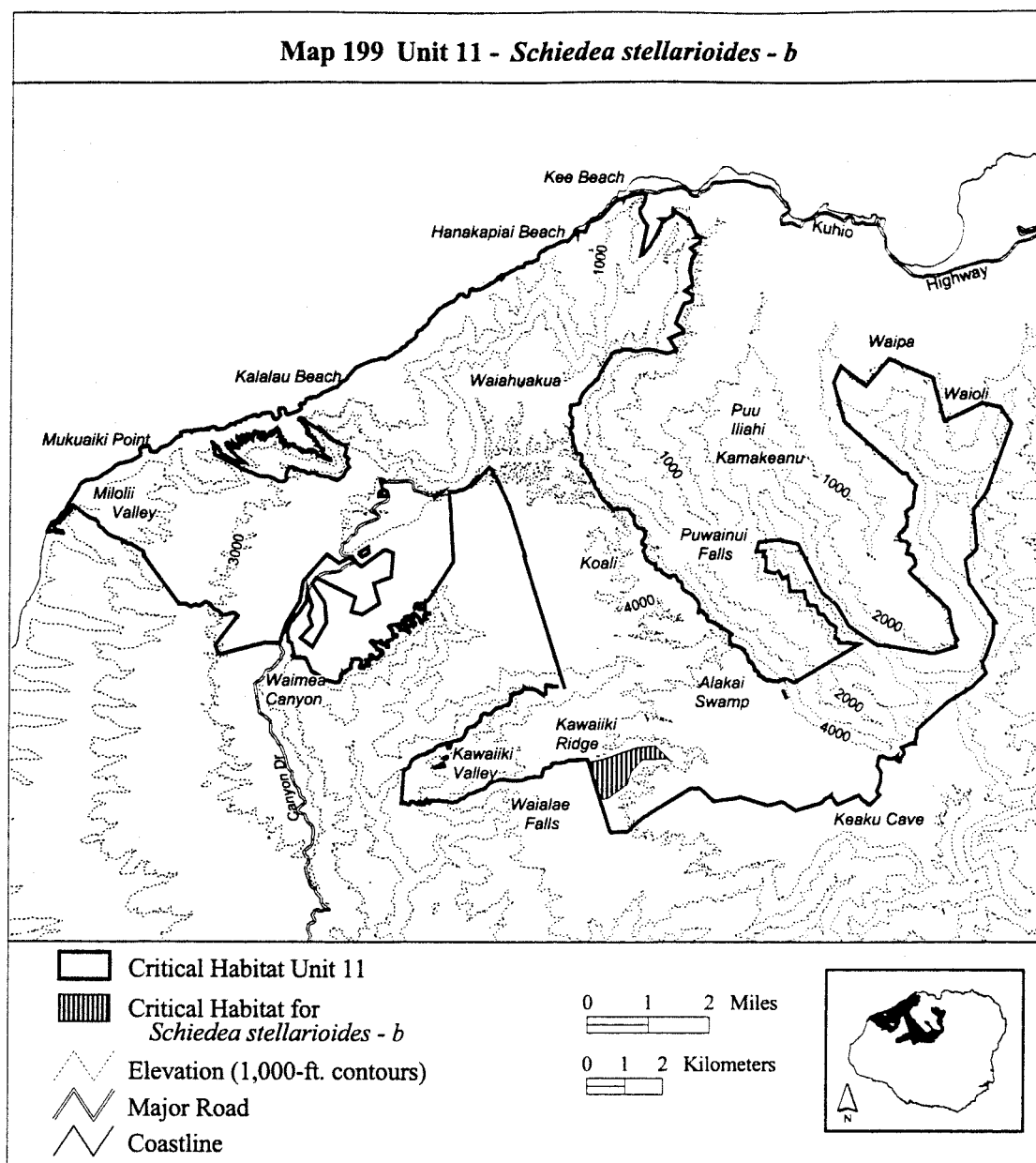
(cxcix) Kauai 11—*Schiedea stellarioides*—b (129 ha; 320 ac)

(A) Unit consists of the following 10
boundary points: Start at 438960,

2442270; 439367, 2442351; 440212,
2442656; 440725, 2442711; 441086,
2442365; 440393, 2442323; 440088,
2442032; 439991, 2441672; 439455,

2441287; 439273, 2441296; return to
starting point.

(B) Note: Map 199 follows:



(cc) Kauai 11—*Solanum sandwicense*—
a (2,398 ha; 5,924 ac)

(A) Unit consists of the following 544 boundary points: Start at 430406, 2449796; 430471, 2449787; 430527, 2449754; 430583, 2449736; 430635, 2449693; 430696, 2449656; 430720, 2449646; 430819, 2449646; 430899, 2449674; 430918, 2449717; 430904, 2449834; 430927, 2449905; 430955, 2449985; 430993, 2450032; 431068, 2450041; 431153, 2450008; 431238, 2449970; 431285, 2449942; 431360, 2449956; 431449, 2449886; 431497, 2449867; 431605, 2449895; 431657, 2449890; 431699, 2449876; 431765, 2449810; 431864, 2449801; 431981, 2449792; 432047, 2449787; 432113, 2449740; 432217, 2449712; 432259,

2449679; 432344, 2449744; 432419, 2449806; 432471, 2449904; 432504, 2449961; 432579, 2450036; 432551, 2450083; 432523, 2450130; 432523, 2450182; 432565, 2450262; 432523, 2450304; 432475, 2450313; 432452, 2450337; 432461, 2450375; 432480, 2450426; 432490, 2450478; 432501, 2450529; 432504, 2450523; 432515, 2450503; 432524, 2450478; 433149, 2450124; 433338, 2449790; 434410, 2449639; 434833, 2449278; 434834, 2449277; 434839, 2449258; 434848, 2449239; 434872, 2449246; 435266, 2448909; 435282, 2448685; 435360, 2447538; 434700, 2446542; 434681, 2446520; 434675, 2446517; 434664, 2446523; 434636, 2446529; 434623, 2446526; 434620, 2446512; 434628,

2446479; 434625, 2446467; 434618, 2446459; 434582, 2446443; 434558, 2446439; 434533, 2446441; 434514, 2446449; 434500, 2446448; 434471, 2446422; 434457, 2446416; 434447, 2446420; 434434, 2446428; 434423, 2446441; 434416, 2446441; 434403, 2446435; 434400, 2446429; 434386, 2446417; 434371, 2446414; 434363, 2446417; 434355, 2446417; 434351, 2446414; 434333, 2446375; 434335, 2446361; 434340, 2446352; 434353, 2446346; 434368, 2446352; 434403, 2446359; 434411, 2446354; 434417, 2446344; 434421, 2446327; 434434, 2446306; 434469, 2446291; 434479, 2446288; 434499, 2446297; 434514, 2446317; 434528, 2446325; 434559, 2446322; 434568, 2446320; 434585,

2446324; 434595, 2446329; 434614,
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2446342; 434611, 2446321; 434609,
2446262; 434614, 2446240; 434625,
2446221; 434647, 2446210; 434667,
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2446128; 434582, 2446114; 434603,
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2449787; 430392, 2449798; 430408, 2449802; 430410, 2449802; return to starting point.

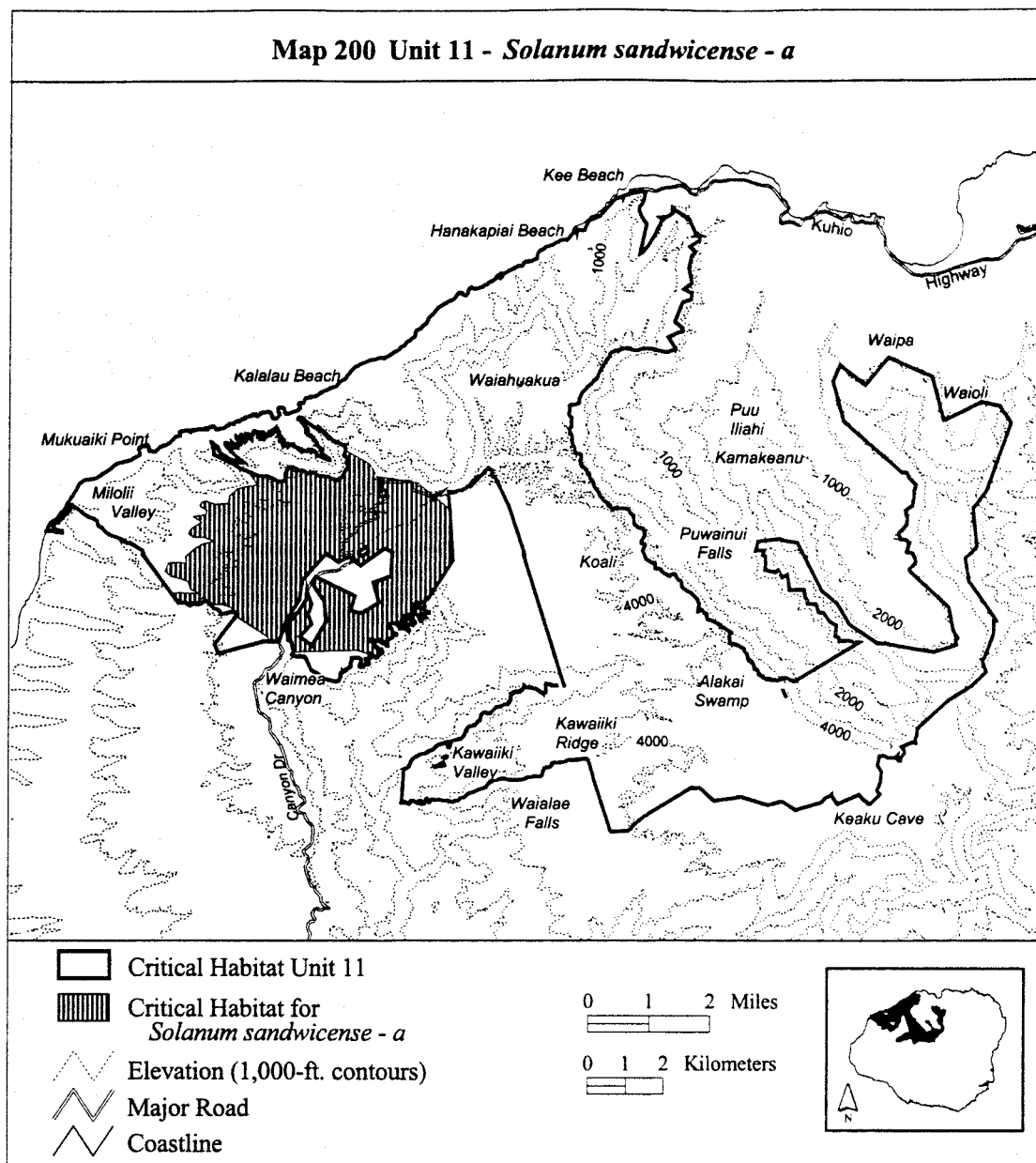
(B) Excluding 3 areas:

(1) Bounded by the following 10 points (3 ha; 8 ac): Start at 433368, 2449292; 433367, 2449352; 433448, 2449426; 433546, 2449412; 433567, 2449398; 433589, 2449323; 433612, 2449262; 433588, 2449244; 433567, 2449260; 433369, 2449255; return to starting point;

(2) Bounded by the following 4 points (3 ha; 8 ac): Start at 433109, 2447775; 432932, 2447668; 432827, 2447751; 433094, 2447922; return to starting point; and

(3) Bounded by the following 9 points (1 ha; 2 ac): Start at 433484, 2449703; 433480, 2449629; 433457, 2449622; 433440, 2449604; 433426, 2449556; 433419, 2449599; 433399, 2449709; 433436, 2449707; 433460, 2449707; return to starting point.

(C) Note: Map 200 follows:



(cci) Kauai 11—*Solanum sandwicense*—b (249 ha; 614 ac)

(A) Unit consists of the following 173 boundary points: Start at 437312,

2441832; 437426, 2442297; 437228, 2442475; 437193, 2442545; 437746, 2443542; 436864, 2443836; 436870, 2443847; 436882, 2443863; 436890,

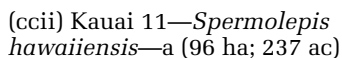
2443877; 436900, 2443900; 436911, 2443923; 436914, 2443936; 436914, 2443948; 436913, 2443962; 436910, 2443981; 436908, 2443995; 436908,

2444013; 436911, 2444027; 436918,
2444040; 436926, 2444047; 436933,
2444055; 436942, 2444065; 436951,
2444073; 436961, 2444084; 436969,
2444094; 436975, 2444098; 436983,
2444102; 436994, 2444107; 437009,
2444108; 437026, 2444105; 437049,
2444100; 437067, 2444092; 437076,
2444089; 437106, 2444090; 437119,
2444096; 437128, 2444104; 437133,
2444112; 437137, 2444122; 437144,
2444130; 437156, 2444135; 437169,
2444141; 437183, 2444150; 437191,
2444154; 437202, 2444165; 437212,
2444177; 437228, 2444198; 437239,
2444213; 437245, 2444227; 437254,
2444239; 437263, 2444246; 437278,
2444240; 437294, 2444234; 437310,
2444225; 437332, 2444217; 437351,
2444217; 437370, 2444223; 437391,
2444223; 437412, 2444226; 437428,
2444226; 437445, 2444223; 437462,
2444219; 437482, 2444211; 437497,
2444205; 437541, 2444190; 437563,
2444183; 437578, 2444179; 437593,
2444170; 437610, 2444160; 437624,
2444146; 437636, 2444132; 437651,

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(B) **Note:** Map 201 follows:



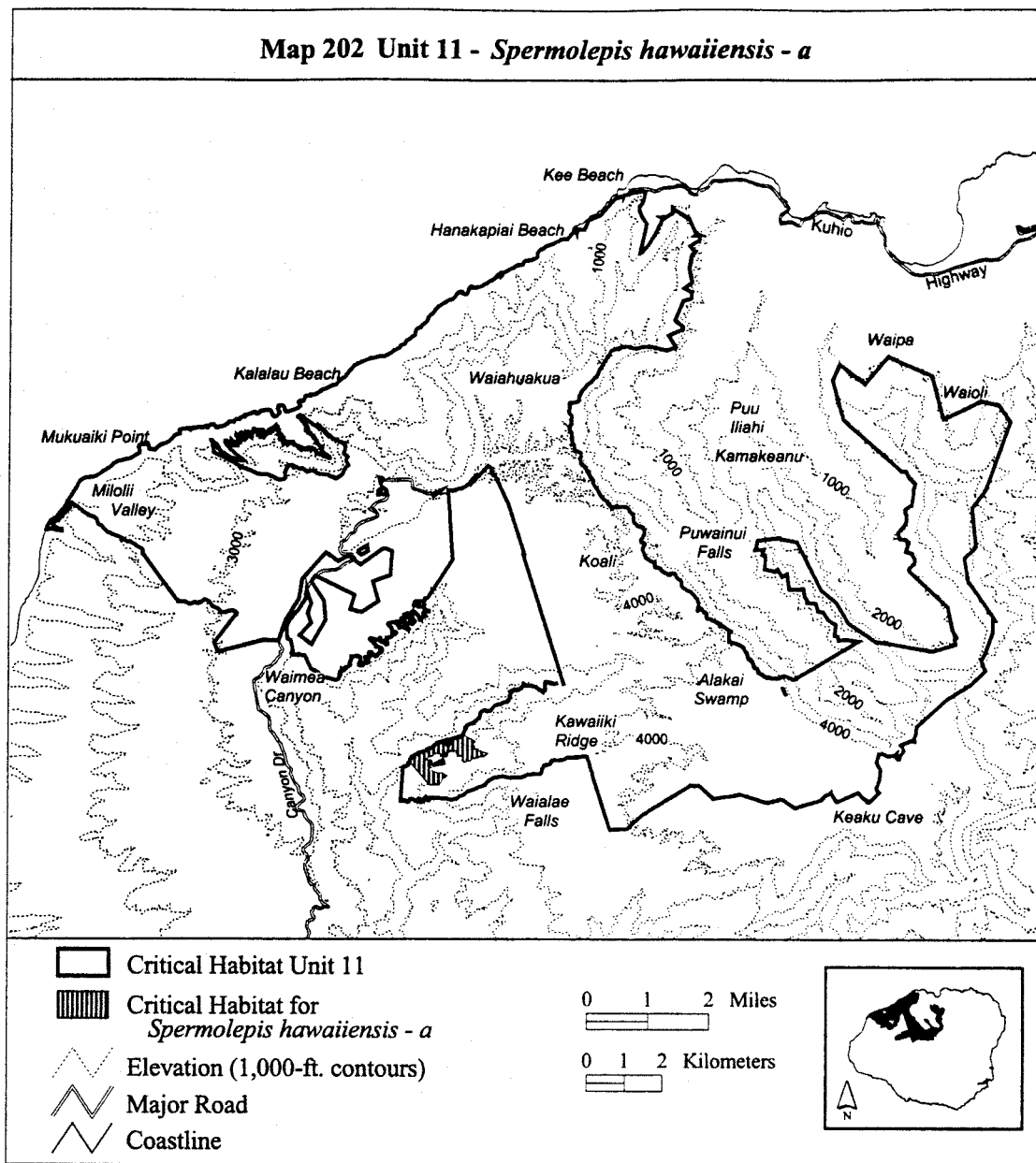
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2442771; 435184, 2442774; 435201,
2442777; 435219, 2442778; 435237,
2442782; 435251, 2442783; 435228,

2442762; 435237, 2442643; 435284,
2442631; return to starting point.
(B) Note: Map 202 follows:



(cciii) Kauai 11—*Stenogyne campanulata*—a (425 ha; 1,050 ac)

(A) Unit consists of the following 144 boundary points: Start at 434899, 2449305; 434804, 2449290; 434736, 2449221; 434553, 2449155; 434346, 2448873; 434346, 2448873; 434133, 2448777; 434083, 2448755; 434075, 2448771; 434056, 2448804; 434012, 2448851; 433982, 2448889; 433967, 2448914; 433940, 2448999; 433923, 2449035; 433901, 2449073; 433878, 2449095; 433816, 2449138; 433722, 2449193; 433702, 2449209; 433670,

2449240; 433661, 2449253; 433655, 2449281; 433657, 2449308; 433655, 2449364; 433644, 2449421; 433637, 2449443; 433599, 2449496; 433583, 2449511; 433542, 2449535; 433502, 2449553; 433474, 2449581; 433459, 2449611; 433455, 2449620; 433457, 2449622; 433480, 2449629; 433484, 2449703; 433460, 2449707; 433445, 2449707; 433447, 2449716; 433452, 2449730; 433426, 2449734; 433382, 2449748; 433360, 2449764; 433333, 2449796; 433315, 2449831; 433305, 2449855; 433306, 2449889; 433274,

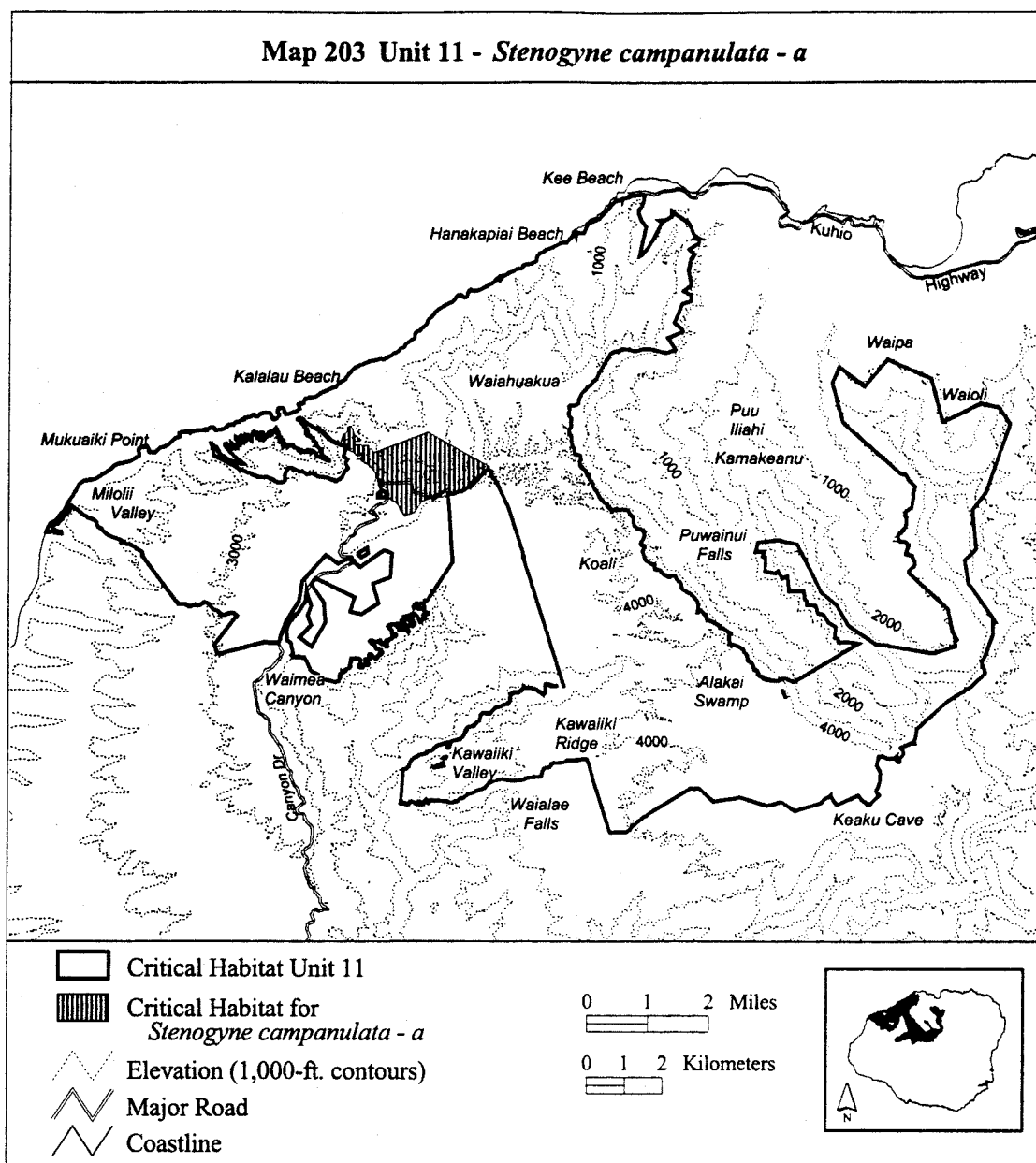
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2450674; 432388, 2450682; 432448,
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2449805; 435988, 2449789; 435981,
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2449360; 435292, 2449379; 435269,
2449384; 435247, 2449385; 435234,
2449384; 435201, 2449386; 435171,
2449398; 435011, 2449352; return to
starting point.

(B) Note: Map 203 follows:



(cciv) Kauai 11—*Wilkesia hobyi*—a
(775 ha; 1,914 ac)

(A) Unit consists of the following 767
boundary points: Start at 429512,
2450126; 429503, 2450126; 429579,

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2449974; 427375, 2450025; 427248,
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2448891; 425421, 2448924; 425388,
2448948; 425362, 2448961; 425329,
2449019; 425500, 2449189; 425804,
2448987; 426108, 2448987; 426387,
2449063; 426083, 2449215; 425778,
2449493; 426589, 2449797; 427020,
2449949; 427020, 2450126; 427121,
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2450227; 427704, 2450354; 427831,
2450506; 428262, 2450708; 428287,
2450176; 428464, 2449974; 428844,
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2450278; 428439, 2450480; 428692,
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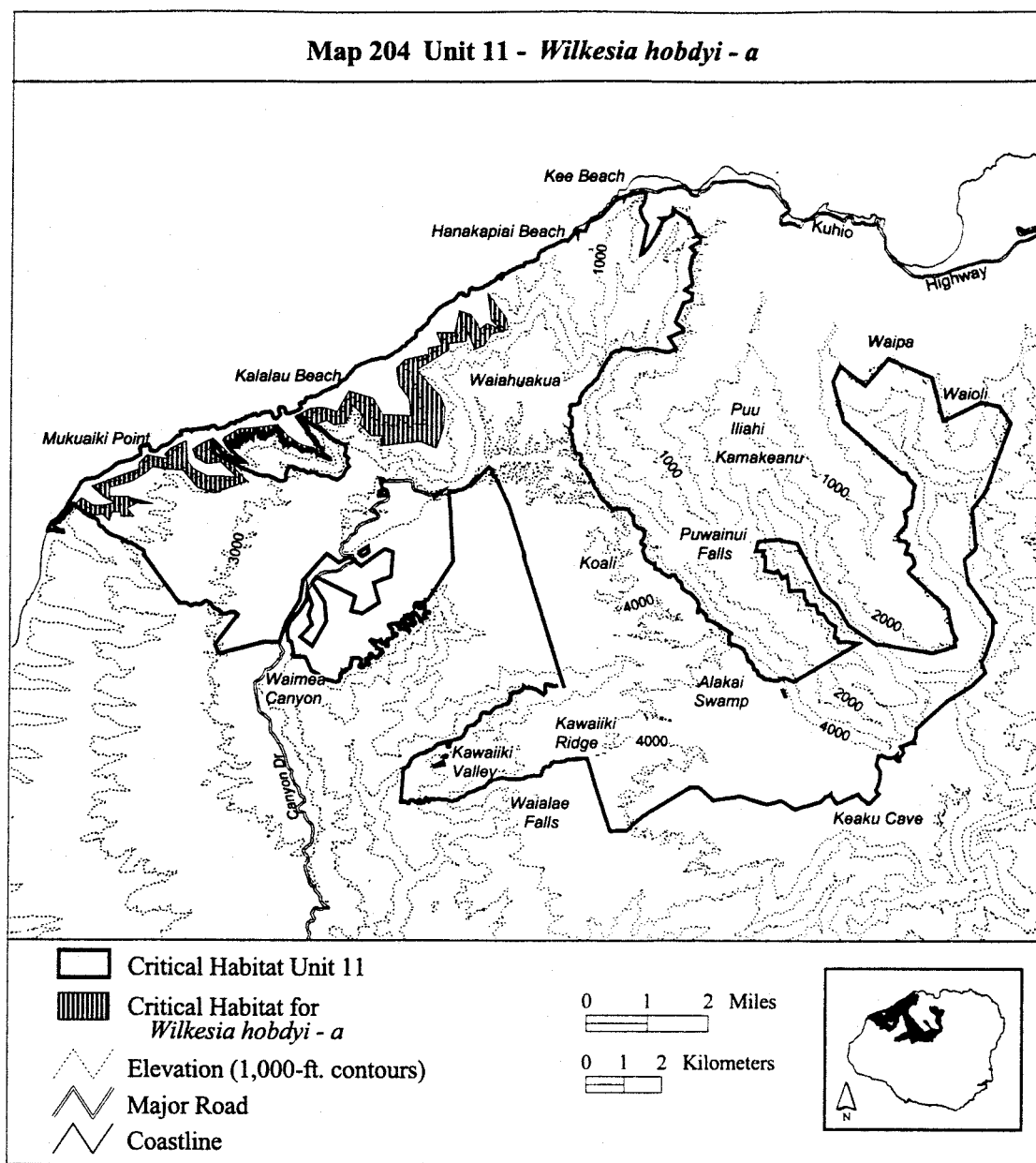
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2450756; 429748, 2450755; 429737,
2450753; 429731, 2450750; 429731,
2450739; 429734, 2450732; 429745,
2450721; 429750, 2450701; 429741,
2450701; 429728, 2450698; 429722,
2450692; 429718, 2450681; 429709,
2450676; 429702, 2450682; 429696,
2450693; 429691, 2450714; 429680,
2450743; 429664, 2450781; 429652,
2450802; 429639, 2450818; 429619,
2450828; 429603, 2450830; 429601,
2450825; 429604, 2450812; 429619,
2450793; 429637, 2450771; 429654,
2450750; 429664, 2450735; 429667,
2450717; 429663, 2450706; 429661,
2450673; 429666, 2450641; 429663,
2450621; 429654, 2450603; 429645,
2450601; 429634, 2450610; 429619,
2450622; 429602, 2450633; 429558,
2450656; 429505, 2450692; 429490,
2450702; 429483, 2450698; 429478,
2450692; 429480, 2450680; 429489,
2450657; 429496, 2450634; 429503,
2450613; 429524, 2450599; 429556,
2450569; 429569, 2450555; 429569,
2450546; 429560, 2450541; 429535,
2450540; 429510, 2450541; 429489,
2450546; 429478, 2450553; 429468,
2450566; 429461, 2450574; 429450,
2450580; 429440, 2450580; 429434,
2450588; 429432, 2450595; 429422,

2450604; 429410, 2450609; 429389,
2450622; 429387, 2450629; 429384,
2450638; 429377, 2450656; 429371,
2450661; 429365, 2450670; 429363,
2450681; 429359, 2450689; 429352,
2450687; 429345, 2450685; 429330,
2450677; 429319, 2450668; 429311,
2450657; 429310, 2450642; 429317,
2450633; 429334, 2450615; 429346,
2450600; 429359, 2450581; 429365,
2450564; 429372, 2450543; 429389,
2450532; 429400, 2450531; 429410,
2450517; 429420, 2450504; 429431,
2450485; 429450, 2450463; 429462,
2450449; 429482, 2450434; 429500,
2450421; 429523, 2450406; 429541,
2450384; 429554, 2450363; 429577,
2450344; 429599, 2450324; 429622,
2450305; 429645, 2450292; 429669,
2450271; 429686, 2450258; 429712,
2450243; 429745, 2450217; 429770,
2450202; 429788, 2450184; 429802,
2450172; 429815, 2450154; 429808,
2450151; 429791, 2450150; 429770,
2450151; 429738, 2450152; 429713,
2450155; 429686, 2450161; 429656,
2450168; 429622, 2450179; 429571,
2450198; 429538, 2450212; 429503,
2450229; 429460, 2450248; 429433,
2450259; 429404, 2450268; 429391,
2450277; 429371, 2450289; 429356,
2450303; 429342, 2450315; 429321,
2450332; 429294, 2450343; 429269,
2450357; 429244, 2450363; 429212,
2450380; 429205, 2450394; 429200,
2450405; 429193, 2450416; 429174,
2450426; 429162, 2450435; 429161,
2450444; 429158, 2450455; 429152,
2450468; 429143, 2450481; 429128,
2450496; 429115, 2450512; 429114,
2450524; 429113, 2450540; 429110,
2450557; 429103, 2450577; 429091,
2450594; 429077, 2450605; 429060,
2450608; 429041, 2450610; 429026,
2450609; 429013, 2450623; 429009,
2450638; 429000, 2450655; 428990,
2450676; 428979, 2450690; 428972,
2450701; 428962, 2450707; 428952,
2450706; 428952, 2450704; 428964,
2450654; 428990, 2450584; 429000,
2450551; 429015, 2450477; 429016,
2450451; 429013, 2450421; 429012,
2450380; 429036, 2450360; 429089,
2450331; 429147, 2450304; 429258,
2450260; return to starting point.

(B) **Note:** Map 204 follows:



(ccv) Kauai 11—*Xylosma crenatum*—a
(840 ha; 2,076 ac)

(A) Unit consists of the following 122 boundary points: Start at 432382, 2447776; 432423, 2447705; 432682, 2447686; 432655, 2447631; 432639, 2447624; 432609, 2447647; 432320, 2447497; 432136, 2447629; 432001, 2447726; 431389, 2447049; 431307, 2447021; 431213, 2446424; 431051, 2446119; 430955, 2445963; 430925, 2445882; 430674, 2445410; 430555, 2445415; 430312, 2445743; 429891, 2446070; 429781, 2447125; 429904, 2447201; 429895, 2447305; 430027, 2447324; 429696, 2447438; 429866, 2447552; 429639, 2447675; 429667, 2447779; 429989, 2447789; 430170, 2447694; 430113, 2447893; 429989,

2448054; 430189, 2448101; 430302, 2447988; 430473, 2448035; 430283, 2448130; 430293, 2448329; 430245, 2448528; 430283, 2448642; 430407, 2448632; 430464, 2448490; 430473, 2448755; 430615, 2448689; 430520, 2448859; 430445, 2449030; 430691, 2448878; 430976, 2448916; 431222, 2448869; 431488, 2448883; 431563, 2448888; 431326, 2448954; 431156, 2449077; 431298, 2449163; 430928, 2449182; 430824, 2449248; 430947, 2449381; 431127, 2449447; 430938, 2449579; 430795, 2449542; 431023, 2449655; 431080, 2449665; 431469, 2449560; 431696, 2449560; 431563, 2449674; 431391, 2449886; 431473, 2449876; 431497, 2449867; 431513, 2449871; 431548, 2449867; 431590,

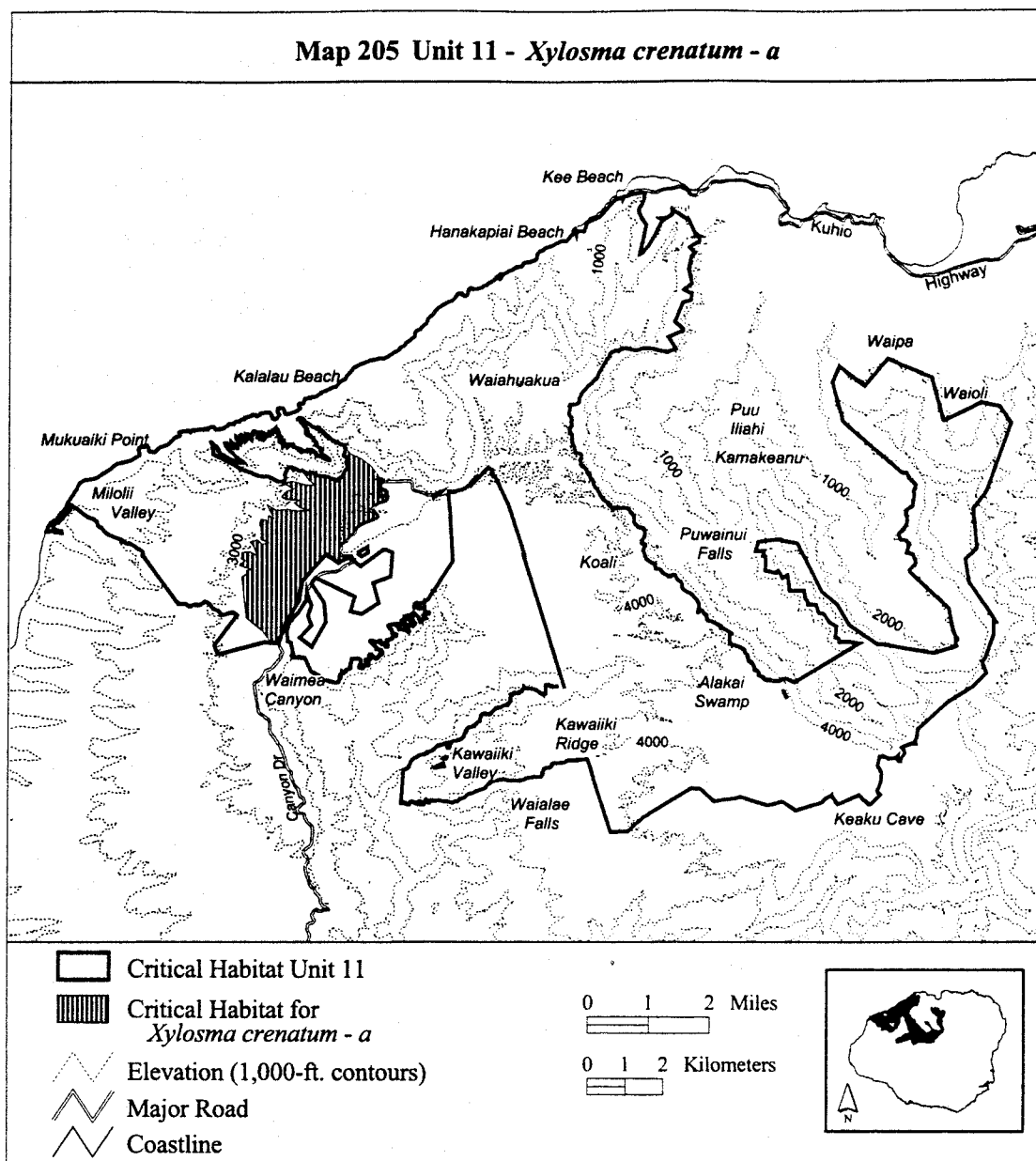
2449891; 431605, 2449895; 431657, 2449890; 431678, 2449883; 431707, 2449868; 431765, 2449810; 431835, 2449804; 432251, 2449685; 432259, 2449679; 432263, 2449682; 432287, 2449675; 432405, 2449773; 432584, 2450032; 432523, 2450178; 432523, 2450182; 432565, 2450262; 432523, 2450304; 432475, 2450313; 432459, 2450330; 432457, 2450334; 432476, 2450414; 432480, 2450426; 432486, 2450458; 432504, 2450523; 432510, 2450542; 432633, 2450391; 432930, 2450259; 433160, 2450085; 433400, 2449772; 433437, 2449726; 433436, 2449707; 433399, 2449709; 433419, 2449599; 433426, 2449556; 433430, 2449518; 433525, 2449415; 433448, 2449426; 433367, 2449352; 433368,

2449292; 433369, 2449255; 433567,
2449260; 433588, 2449244; 433599,
2449252; 433608, 2449246; 433610,
2449137; 433383, 2449073; 433181,

2448930; 433395, 2448719; 433088,
2448562; 432861, 2448469; 432612,
2448172; 432493, 2448031; 432404,

2447993; 432356, 2447820; return to
starting point.

(B) Note: Map 205 follows:



(ccvi) Kauai 11—*Zanthoxylum hawaiiense*—a (523 ha; 1,292 ac)

(A) Unit consists of the following 402 boundary points: Start at 435336, 2442801; 435344, 2442802; 435367, 2442807; 435391, 2442814; 435415, 2442819; 435435, 2442826; 435454, 2442831; 435476, 2442838; 435496, 2442844; 435516, 2442850; 435530, 2442853; 435534, 2442855; 435543, 2442858; 435556, 2442862; 435571, 2442867; 435585, 2442876; 435598, 2442885; 435608, 2442891; 435619,

2442899; 435627, 2442904; 435642, 2442920; 435658, 2442932; 435668, 2442948; 435673, 2442959; 435681, 2442977; 435688, 2442995; 435693, 2443006; 435698, 2443024; 435704, 2443036; 435708, 2443047; 435715, 2443064; 435722, 2443078; 435725, 2443086; 435729, 2443093; 435735, 2443103; 435738, 2443112; 435743, 2443127; 435749, 2443138; 435753, 2443149; 435757, 2443155; 435766, 2443169; 435778, 2443179; 435790, 2443186; 435804, 2443188; 435821,

2443194; 435842, 2443199; 435861, 2443202; 435874, 2443204; 435889, 2443208; 435904, 2443211; 435933, 2443223; 435942, 2443232; 435949, 2443246; 435958, 2443255; 435969, 2443263; 435979, 2443271; 435993, 2443281; 436010, 2443297; 436032, 2443316; 436048, 2443332; 436064, 2443343; 436080, 2443358; 436089, 2443375; 436095, 2443390; 436100, 2443403; 436107, 2443421; 436113, 2443456; 436118, 2443477; 436123, 2443502; 436134, 2443520; 436146,

2443534; 436160, 2443543; 436175, 2443554; 436190, 2443560; 436213, 2443563; 436227, 2443563; 436240, 2443562; 436254, 2443557; 436265, 2443552; 436274, 2443547; 436287, 2443540; 436300, 2443537; 436315, 2443532; 436328, 2443529; 436337, 2443528; 436348, 2443531; 436357, 2443536; 436369, 2443546; 436380, 2443558; 436392, 2443572; 436403, 2443585; 436421, 2443611; 436438, 2443631; 436460, 2443655; 436478, 2443676; 436497, 2443688; 436518, 2443696; 436534, 2443700; 436558, 2443707; 436576, 2443711; 436597, 2443714; 436611, 2443716; 436630, 2443718; 436644, 2443720; 436655, 2443724; 436666, 2443731; 436678, 2443742; 436697, 2443756; 436708, 2443763; 436726, 2443769; 436745, 2443772; 436758, 2443775; 436771, 2443776; 436788, 2443776; 436799, 2443778; 436808, 2443781; 436818, 2443785; 436823, 2443786; 436829, 2443790; 436837, 2443797; 436841, 2443801; 436845, 2443807; 436852, 2443819; 436861, 2443831; 436870, 2443847; 436882, 2443863; 436890, 2443877; 436900, 2443900; 436911, 2443923; 436914, 2443936; 436914, 2443948; 436913, 2443962; 436910, 2443981; 436908, 2443995; 436908, 2444013; 436911, 2444027; 436918, 2444040; 436926, 2444047; 436933, 2444055; 436942, 2444065; 436951, 2444073; 436961, 2444084; 436969, 2444094; 436975, 2444098; 436983, 2444102; 436994, 2444107; 437009, 2444108; 437026, 2444105; 437049, 2444100; 437067, 2444092; 437076, 2444089; 437106, 2444090; 437119, 2444096; 437128, 2444104; 437133, 2444112; 437137, 2444122; 437144, 2444130; 437156, 2444135; 437169, 2444141; 437183, 2444150; 437191, 2444154; 437202, 2444165; 437212, 2444177; 437228, 2444198; 437239, 2444213; 437245, 2444227; 437254, 2444239; 437263, 2444246; 437278, 2444240; 437294, 2444234; 437310, 2444225; 437332, 2444217; 437351, 2444217; 437370, 2444223; 437391, 2444223; 437412, 2444226; 437428, 2444226; 437445, 2444223; 437462, 2444219; 437482, 2444211; 437497, 2444205; 437541, 2444190; 437563, 2444183; 437578, 2444179; 437593, 2444170; 437610, 2444160; 437624, 2444146; 437636, 2444132; 437651, 2444119; 437671, 2444112; 437691,

2444102; 437703, 2444093; 437722, 2444082; 437732, 2444069; 437749, 2444061; 437758, 2444058; 437768, 2444060; 437780, 2444066; 437810, 2444080; 437821, 2444088; 437831, 2444100; 437833, 2444111; 437835, 2444126; 437833, 2444139; 437827, 2444163; 437822, 2444185; 437820, 2444206; 437818, 2444236; 437824, 2444265; 437828, 2444292; 437836, 2444314; 437843, 2444322; 437854, 2444327; 437871, 2444328; 437887, 2444323; 437909, 2444314; 437933, 2444302; 437960, 2444289; 437984, 2444274; 438007, 2444260; 438028, 2444258; 438048, 2444258; 438072, 2444260; 438087, 2444266; 438109, 2444271; 438133, 2444273; 438164, 2444270; 438196, 2444263; 438254, 2444242; 438334, 2444171; 438431, 2444207; 438595, 2444371; 438699, 2444353; 438820, 2444201; 438893, 2444079; 438881, 2443982; 438802, 2443915; 438583, 2443715; 438431, 2443605; 438273, 2443538; 438151, 2443532; 438005, 2443636; 437956, 2443684; 437622, 2443660; 437451, 2443545; 437391, 2443459; 437245, 2443374; 436959, 2443186; 436843, 2443009; 436867, 2442809; 437019, 2442657; 437026, 2442577; 437019, 2442456; 437135, 2442310; 437281, 2442225; 437403, 2442176; 437476, 2442073; 437415, 2441987; 437202, 2441921; 436946, 2441921; 436734, 2441951; 436606, 2441945; 436490, 2441854; 436405, 2441817; 436289, 2441817; 436125, 2441866; 436052, 2441866; 435997, 2441817; 435924, 2441726; 435784, 2441677; 435699, 2441617; 435693, 2441531; 435699, 2441465; 435657, 2441428; 435547, 2441428; 435401, 2441495; 435310, 2441489; 435298, 2441329; 435258, 2441222; 435245, 2441229; 435201, 2441226; 435127, 2441232; 435053, 2441251; 435010, 2441263; 434950, 2441241; 434901, 2441226; 434881, 2441230; 434867, 2441252; 434859, 2441262; 434851, 2441266; 434843, 2441266; 434811, 2441263; 434806, 2441260; 434794, 2441245; 434787, 2441223; 434779, 2441196; 434754, 2441166; 434742, 2441170; 434733, 2441191; 434717, 2441232; 434699, 2441277; 434696, 2441283; 434689, 2441286; 434676, 2441286; 434669, 2441281; 434661, 2441273; 434653, 2441254; 434641, 2441213; 434631, 2441186; 434629, 2441175; 434626,

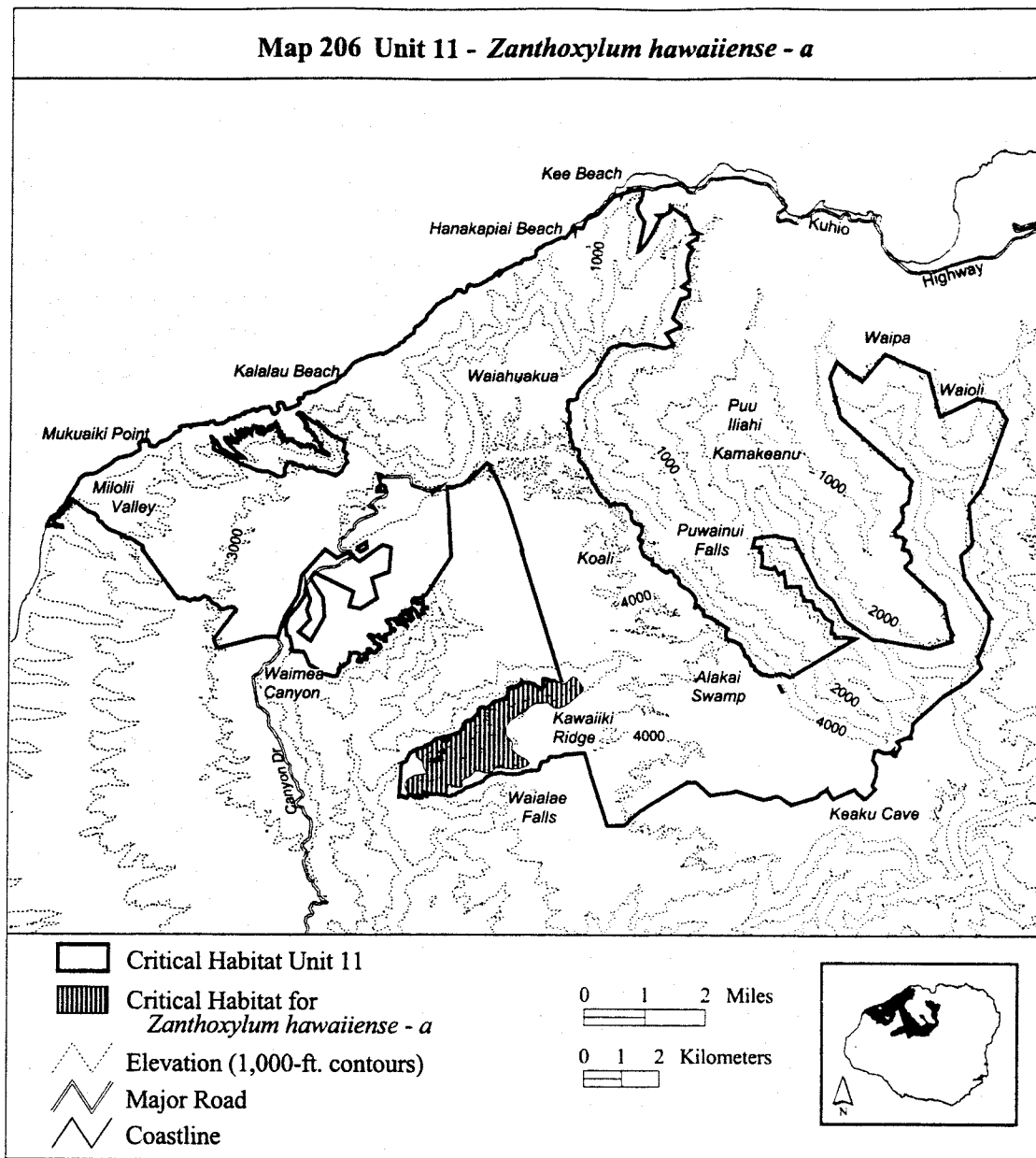
2441167; 434615, 2441161; 434592, 2441168; 434580, 2441170; 434570, 2441168; 434563, 2441163; 434556, 2441145; 434551, 2441140; 434542, 2441137; 434538, 2441144; 434535, 2441154; 434536, 2441173; 434530, 2441201; 434523, 2441222; 434520, 2441227; 434516, 2441230; 434508, 2441229; 434501, 2441223; 434489, 2441216; 434475, 2441203; 434448, 2441190; 434424, 2441176; 434397, 2441178; 434359, 2441197; 434333, 2441217; 434325, 2441222; 434308, 2441229; 434293, 2441229; 434290, 2441228; 434233, 2441313; 434184, 2441410; 434172, 2441489; 434227, 2441617; 434409, 2441732; 434726, 2441787; 434750, 2441817; 434720, 2441872; 434671, 2441933; 434641, 2442103; 434574, 2442152; 434495, 2442219; 434476, 2442219; 434459, 2442342; 434477, 2442433; 434486, 2442437; 434504, 2442450; 434522, 2442454; 434537, 2442457; 434563, 2442460; 434590, 2442462; 434610, 2442464; 434628, 2442472; 434643, 2442483; 434664, 2442490; 434680, 2442493; 434700, 2442502; 434713, 2442515; 434725, 2442524; 434735, 2442532; 434755, 2442542; 434775, 2442551; 434800, 2442556; 434822, 2442562; 434842, 2442574; 434862, 2442596; 434883, 2442613; 434896, 2442626; 434916, 2442647; 434934, 2442668; 434949, 2442681; 434972, 2442699; 434986, 2442705; 434997, 2442708; 435006, 2442713; 435012, 2442717; 435026, 2442719; 435039, 2442722; 435061, 2442727; 435081, 2442733; 435100, 2442739; 435119, 2442747; 435135, 2442754; 435150, 2442764; 435164, 2442771; 435184, 2442774; 435201, 2442777; 435219, 2442778; 435237, 2442782; 435251, 2442783; 435228, 2442762; 435237, 2442643; 435284, 2442631; return to starting point.

(B) Excluding 2 areas:

(1) Bounded by the following 3 points (1 ha, 3 ac): Start at 435132, 2442248; 435160, 2442164; 434848, 2442098; return to starting point; and

(2) Bounded by the following 4 points (0 ha, 1 ac): Start at 435151, 2442425; 435215, 2442393; 435195, 2442353; 435128, 2442379; return to starting point.

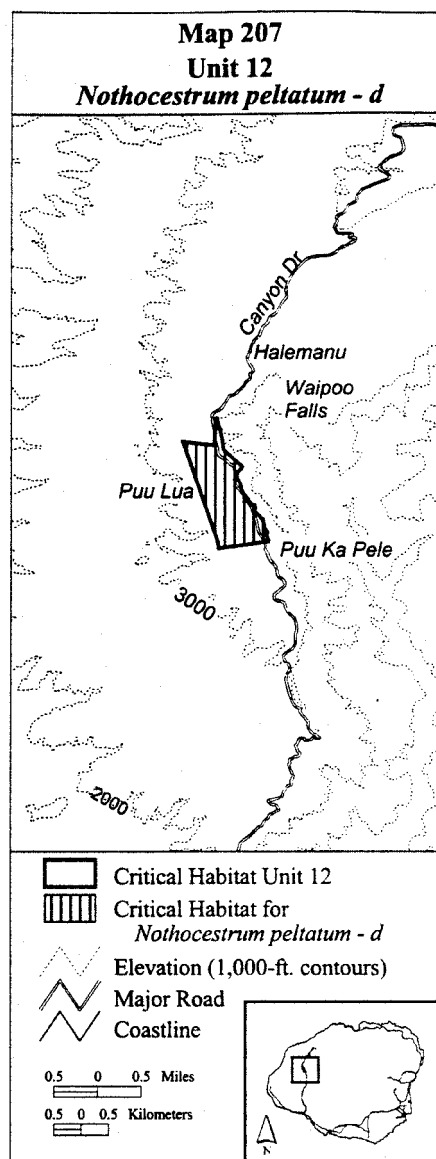
(C) Note: Map 206 follows:



(ccvii) Kauai 12—*Nothocestrum peltatum*—d (162 ha; 400 ac)

(A) Unit consists of the following 65 boundary points: Start at 431190, 2442015; 430254, 2441884; 430238, 2442005; 429593, 2443842; 430155, 2443777; 430205, 2444275; 430214, 2444280; 430308, 2443912; 430339, 2443693; 430676, 2443374; 430654, 2443340; 430640, 2443324; 430608, 2443294; 430597, 2443274; 430587, 2443203; 430586, 2443158; 430592, 2443144; 430612, 2443121; 430634, 2443085; 430661, 2443014; 430671, 2442975; 430675, 2442949; 430682, 2442928; 430690, 2442911; 430702, 2442896; 430742, 2442852; 430777, 2442811; 430786, 2442795; 430789, 2442762; 430795, 2442751; 430844, 2442701; 430857, 2442692; 430896, 2442674; 430907, 2442665; 430914, 2442656; 430921, 2442640; 430921, 2442620; 430918, 2442601; 430912, 2442582; 430914, 2442564; 430919, 2442555; 430931, 2442541; 430947, 2442529; 430975, 2442502; 431001, 2442469; 431018, 2442445; 431030, 2442435; 431051, 2442425; 431058, 2442415; 431061, 2442389; 431068, 2442359; 431085, 2442326; 431091, 2442304; 431090, 2442285; 431094, 2442268; 431108, 2442231; 431119, 2442215; 431132, 2442205; 431142, 2442193; 431142, 2442168; 431126, 2442140; 431123, 2442121; 431130, 2442104; 431167, 2442034; 431188, 2442016; return to starting point.

(B) Note: Map 207 follows:

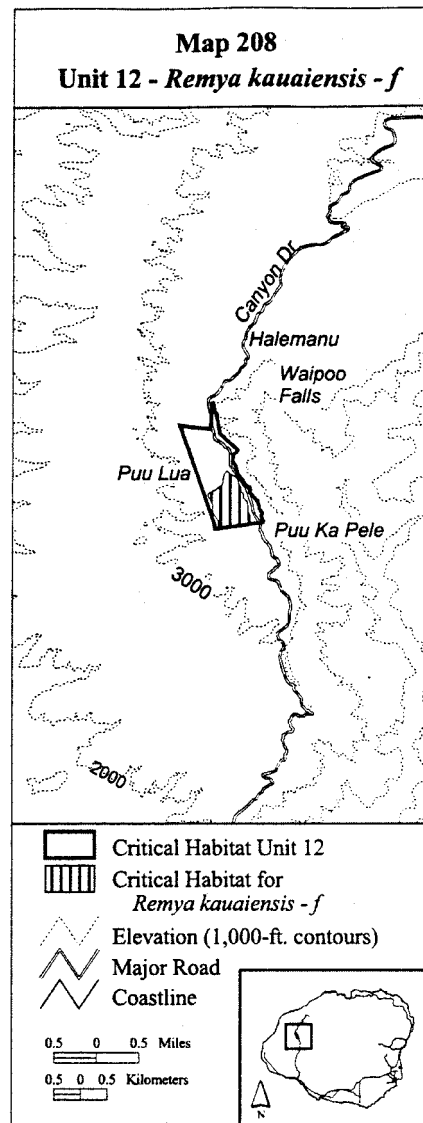


(ccviii) Kauai 12—*Remya kauaiensis*—f (52 ha; 128 ac)

(A) Unit consists of the following 42 boundary points: Start at 430320, 2441937; 430316, 2441992; 430320, 2442046; 430290, 2442087; 430221, 2442167; 430221, 2442192; 430203, 2442243; 430214, 2442345; 430181, 2442389; 430163, 2442448; 430130, 2442480; 430119, 2442542; 430148, 2442568; 430258, 2442619; 430334, 2442666; 430382, 2442714; 430407, 2442779; 430407, 2442841; 430422, 2442911; 430458, 2442951; 430465, 2442976; 430502, 2442954; 430542, 2442911; 430608, 2442896; 430659, 2442845; 430684, 2442801; 430684, 2442754; 430695, 2442721; 430728, 2442684; 430739, 2442593; 430779, 2442550; 430783, 2442477; 430812, 2442440; 430859, 2442400; 430877, 2442313; 430881, 2442218; 430907, 2442138; 430921, 2442006; 430888,

2441992; 430699, 2441963; 430582, 2441941; 430356, 2441922; return to starting point.

(B) Note: Map 208 follows:

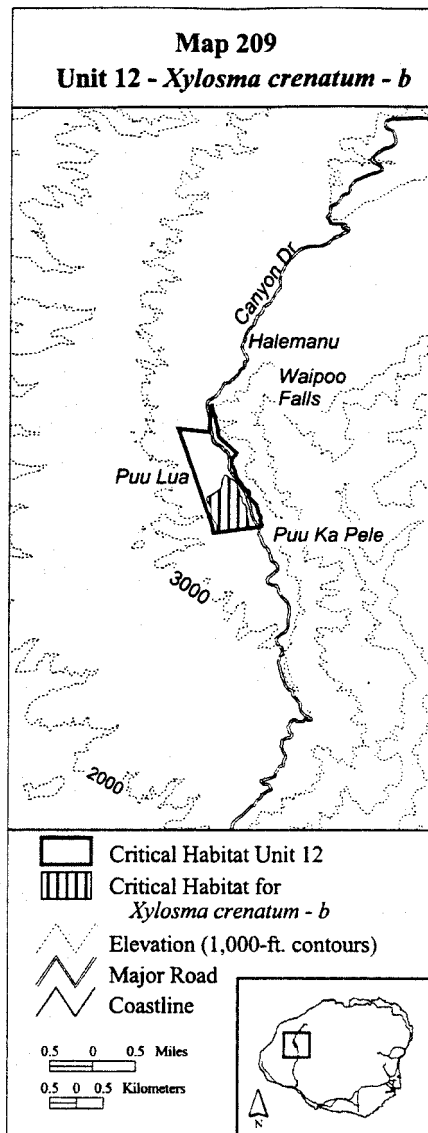


(ccix) Kauai 12—*Xylosma crenatum*—b (52 ha; 128 ac)

(A) Unit consists of the following 42 boundary points: Start at 430320, 2441937; 430316, 2441992; 430320, 2442046; 430290, 2442087; 430221, 2442167; 430221, 2442192; 430203, 2442243; 430214, 2442345; 430181, 2442389; 430163, 2442448; 430130, 2442480; 430119, 2442542; 430148, 2442568; 430258, 2442619; 430334, 2442666; 430382, 2442714; 430407, 2442779; 430407, 2442841; 430422, 2442911; 430458, 2442951; 430465, 2442976; 430502, 2442954; 430542, 2442911; 430608, 2442896; 430659, 2442845; 430684, 2442801; 430684, 2442754; 430695, 2442721; 430728, 2442684; 430739, 2442593; 430779,

2442550; 430783, 2442477; 430812, 2442440; 430859, 2442400; 430877, 2442313; 430881, 2442218; 430907, 2442138; 430921, 2442006; 430888, 2441992; 430699, 2441963; 430582, 2441941; 430356, 2441922; return to starting point.

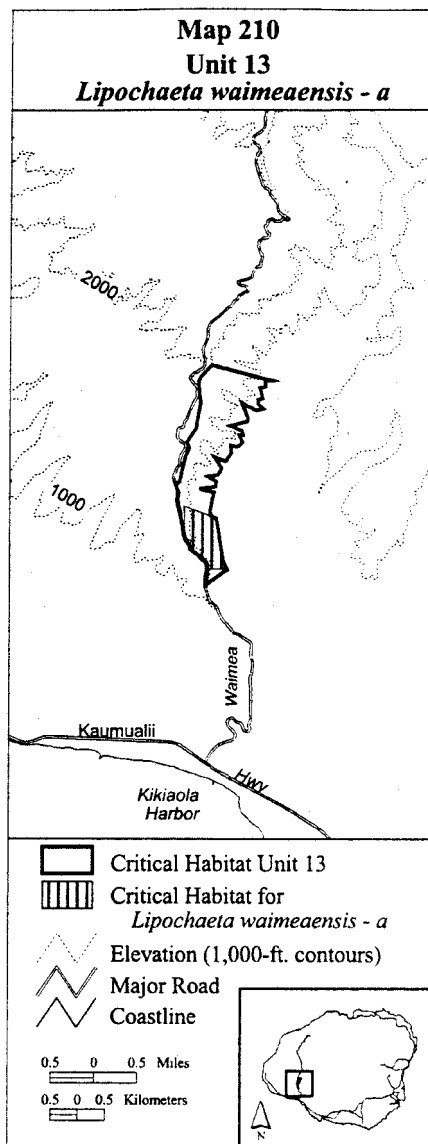
(B) Note: Map 209 follows:



(ccx) Kauai 13—*Lipochaeta waimeaeensis*—a (56 ha; 139 ac)

(A) Unit consists of the following 18 boundary points: Start at 430198, 2432906; 430189, 2433035; 430229, 2433022; 430792, 2432814; 430834, 2432547; 430921, 2432026; 430997, 2431853; 430996, 2431853; 430633, 2431864; 430621, 2431947; 430622, 2431957; 430619, 2431960; 430615, 2431990; 430308, 2432247; 430317, 2432397; 430247, 2432440; 430207, 2432544; 430198, 2432716; return to starting point.

(B) Note: Map 210 follows:

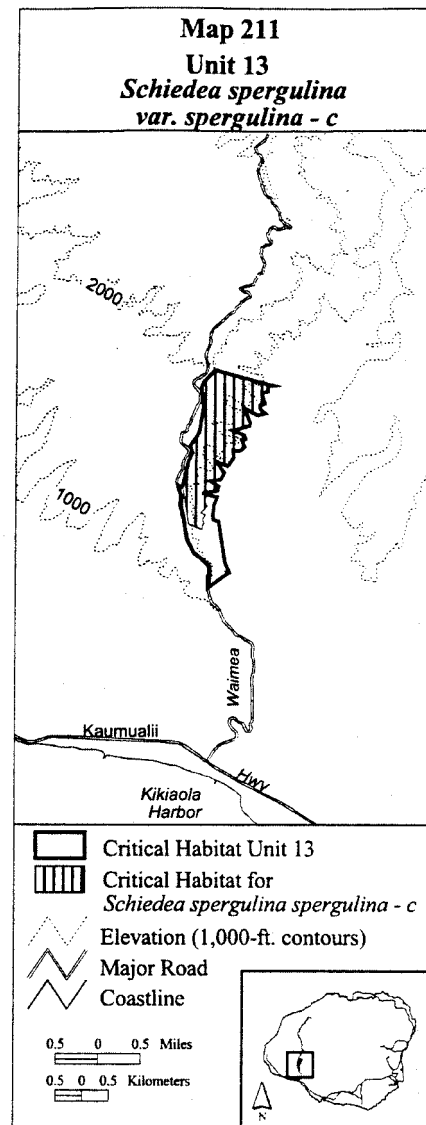


(ccxi) Kauai 13—*Schiedea spergulina* var. *spergulina*—c (221 ha; 545 ac)

(A) Unit consists of the following 59 boundary points: Start at 430475, 2432656; 430222, 2432760; 430103, 2433479; 430210, 2433949; 430290, 2434118; 430239, 2434242; 430239, 2434243; 430259, 2434273; 430414, 2434498; 430435, 2434630; 430495, 2434992; 430479, 2435099; 430454, 2435369; 430488, 2435448; 430698, 2435675; 430703, 2435680; 431807, 2435389; 431700, 2435381; 431700, 2435274; 431600, 2435251; 431654, 2435052; 431562, 2435029; 431562, 2434945; 431661, 2434861; 431661, 2434861; 431524, 2434832; 431520, 2434828; 431263, 2434968; 431370, 2434692; 431363, 2434623; 431049, 2434539; 431256, 2434455; 431294, 2434371; 431217, 2434363; 431267, 2434228; 431236, 2434191; 431179, 2434149; 431057, 2434164; 431072, 2434034; 430969, 2433883; 430955,

2433867; 430955, 2433866; 430750, 2433950; 430892, 2433741; 430865, 2433686; 430819, 2433613; 430635, 2433582; 430789, 2433483; 430785, 2433441; 430774, 2433398; 430505, 2433360; 430544, 2433268; 430513, 2433223; 430567, 2433100; 430459, 2432985; 430536, 2432939; 430482, 2432847; 430521, 2432771; 430490, 2432756; return to starting point.

(B) Note: Map 211 follows:

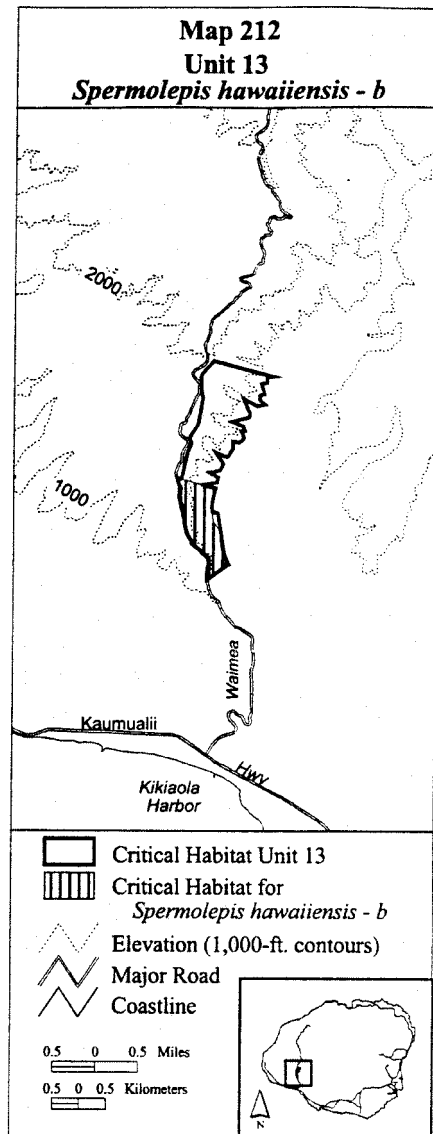


(ccxii) Kauai 13—*Spermolepis hawaiiensis*—b (87 ha; 215 ac)

(A) Unit consists of the following 29 boundary points: Start at 430602, 2431571; 430633, 2431875; 430620, 2431939; 430622, 2431957; 430615, 2431963; 430605, 2432015; 430417, 2432156; 430304, 2432274; 430205, 2432470; 430137, 2432799; 430123, 2432906; 430115, 2432961; 430081, 2433067; 430077, 2433154; 430099, 2433286; 430054, 2433369; 430032, 2433480; 430032, 2433480; 430747,

2433285; 430743, 2433270; 430745, 2433254; 430708, 2433142; 430680, 2432935; 430698, 2432672; 430820, 2432494; 430839, 2432344; 430858, 2432156; 430952, 2431931; 430980, 2431846; return to starting point.

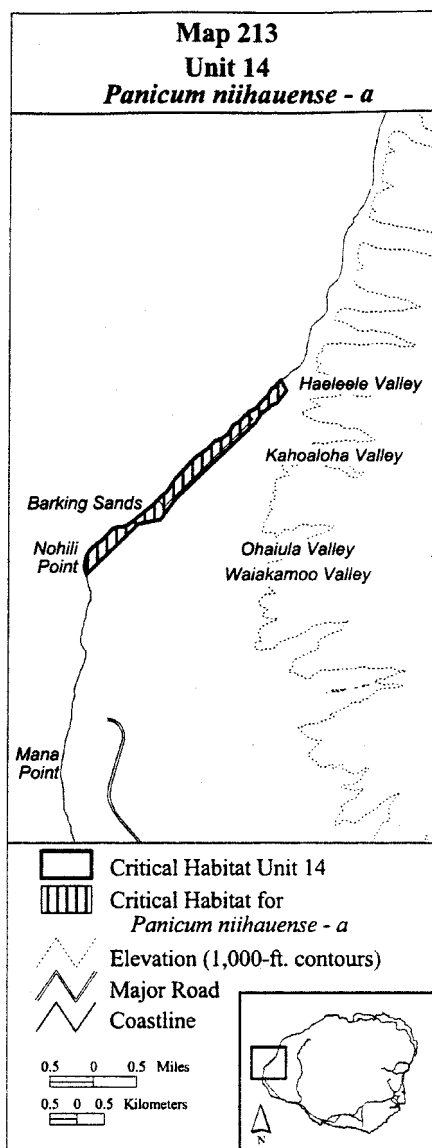
(B) Note: Map 212 follows:



(ccxiii) Kauai 14—*Panicum niihauense*—a (120 ha; 297 ac)

(A) Unit consists of the following 17 boundary points: coastline; 420498, 2440857; 420095, 2440787; 419127, 2439857; 422725, 2443464; 422749, 2443432; 422830, 2443273; 422794, 2443226; 422660, 2443057; 422609, 2443018; 422557, 2443003; 422396, 2442865; 422383, 2442876; 422340, 2442802; 422337, 2442797; 422267, 2442675; 422055, 2442471; 420764, 2441227; coastline.

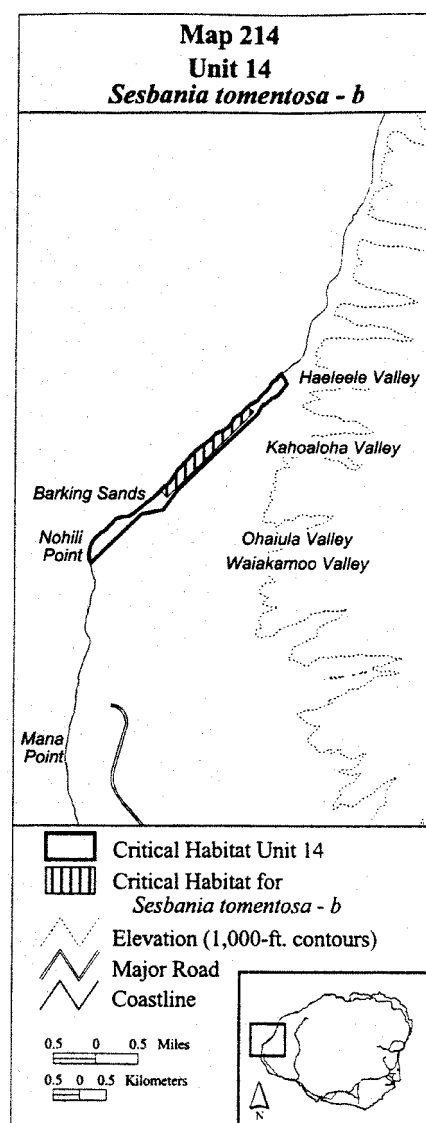
(B) Note: Map 213 follows:



(ccxiv) Kauai 14—*Sesbania tomentosa*—b (44 ha; 110 ac)

(A) Unit consists of the following 7 boundary points: coastline; 422206, 2442741; 421987, 2442507; 420735, 2441277; 420643, 2441178; 420572, 2441093; 420438, 2441235; 422071, 2442818; coastline.

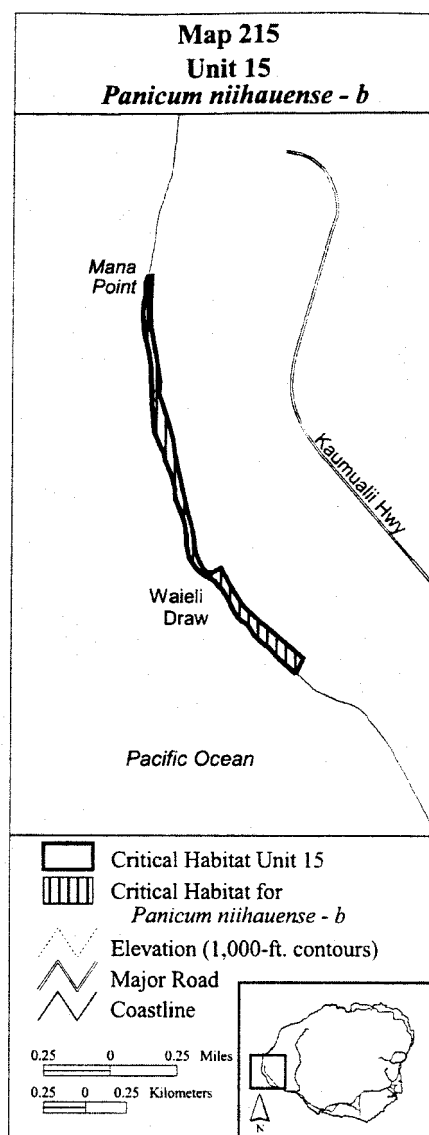
(B) Note: Map 214 follows:



(ccxv) Kauai 15—*Panicum niihauense*—b (16 ha; 39 ac)

(A) Unit consists of the following 24 boundary points: coastline; 418718, 2436405; 418711, 2436261; 418713, 2436100; 418746, 2435916; 418771, 2435768; 418763, 2435699; 418816, 2435550; 418853, 2435417; 418863, 2435329; 418904, 2435147; 418938, 2434999; 418971, 2434874; 418992, 2434737; 419022, 2434668; 419057, 2434621; 419092, 2434621; 419145, 2434647; 419209, 2434531; 419280, 2434420; 419395, 2434316; 419428, 2434292; 419645, 2434109; 419600, 2434015; 418693, 2436403; coastline.

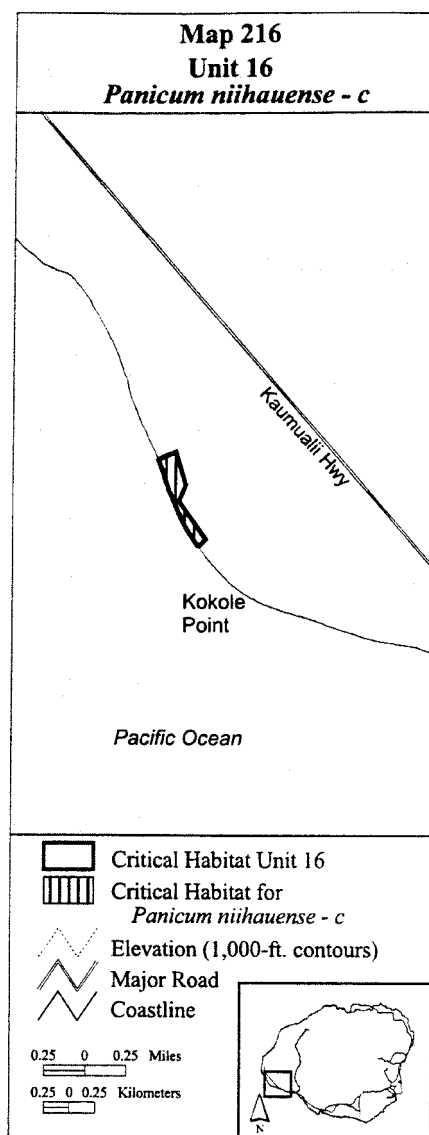
(B) Note: Map 215 follows:



(ccxvi) Kauai 16—*Panicum niihauense*—c (11 ha; 28 ac)

(A) Unit consists of the following 8 boundary points: coastline; 421032, 2432070; 421129, 2431750; 421067, 2431592; 421328, 2431221; 421301,

2431191; 421254, 2431147; 420862, 2431988; 420900, 2432013; coastline.
(B) Note: Map 216 follows:

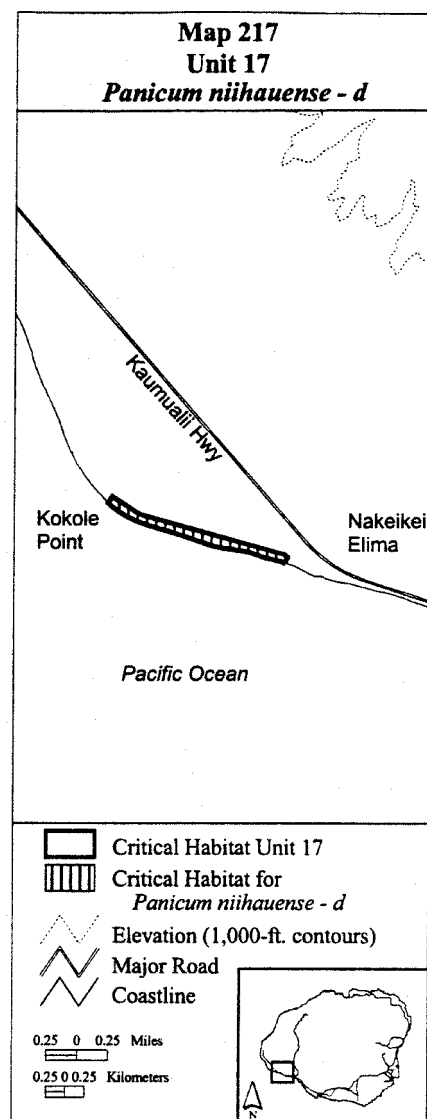


(ccxvii) Kauai 17—*Panicum niihauense*—d (28 ha; 68 ac)

(A) Unit consists of the following 5 boundary points: coastline; 423847,

2430037; 423765, 2429965; 422210, 2430021; 421524, 2430758; 421555, 2430809; coastline.

(B) Note: Map 217 follows:



(CCXVIII) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR KAUAI

Unit name	Species occupied	Species unoccupied
Kauai 1— <i>Ischaemum byrone</i> —a	<i>Ischaemum byrone</i>	<i>Ischaemum byrone</i>
Kauai 2— <i>Ischaemum byrone</i> —b .....	.....	
Kauai 3— <i>Ischaemum byrone</i> —c	<i>Ischaemum byrone</i> .	
Kauai 4— <i>Adenophorus periens</i> —a	<i>Adenophorus periens</i>	
Kauai 4— <i>Cyanea asarifolia</i> —a	<i>Cyanea asarifolis</i>	
Kauai 4— <i>Cyanea recta</i> —a	<i>Cyanea recta</i>	
Kauai 4— <i>Cyanea recta</i> —b	<i>Cyanea recta</i>	
Kauai 4— <i>Cyanea remyi</i> —a	<i>Cyanea remyi</i>	
Kauai 4— <i>Cyrtandra cyaneoides</i> —a	<i>Cyrtandra cyaneoides</i>	
Kauai 4— <i>Cyrtandra limahuliensis</i> —a	<i>Cyrtandra limahuliensis</i>	
Kauai 4— <i>Cyrtandra limahuliensis</i> —b	<i>Cyrtandra limahuliensis</i>	
Kauai 4— <i>Hibiscus clayi</i> —a		<i>Hibiscus clayi</i>
Kauai 4— <i>Hibiscus clayi</i> —b		<i>Hibiscus clayi</i>

(CCXVIII) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR KAUAI—Continued

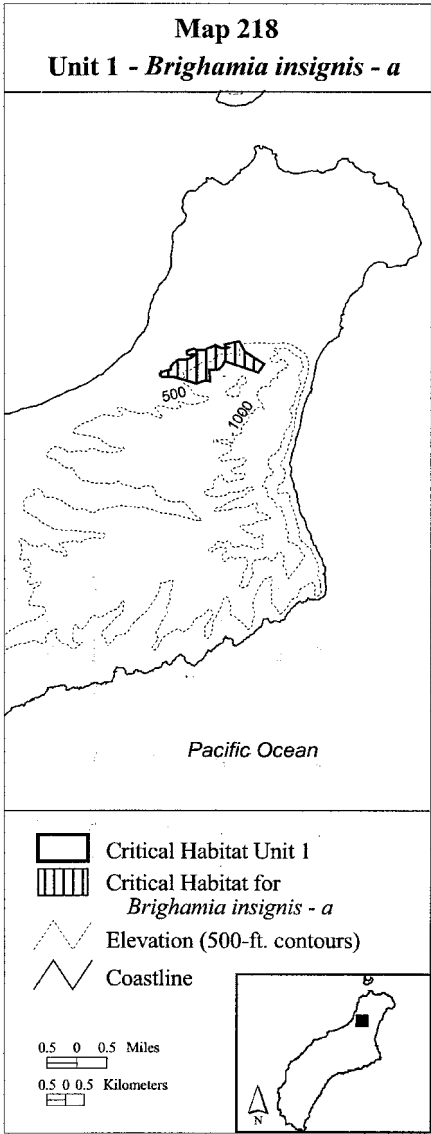
Unit name	Species occupied	Species unoccupied
Kauai 4— <i>Hibiscus clayi</i> —c .....	.....	<i>Hibiscus clayi</i>
Kauai 4— <i>Hibiscus clayi</i> —d .....	.....	<i>Hibiscus clayi</i>
Kauai 4— <i>Hibiscus clayi</i> —e .....	.....	<i>Hibiscus clayi</i>
Kauai 4— <i>Labordia lydgatei</i> —a	<i>Labordia lydgatei</i>	
Kauai 4— <i>Phyllostegia wawrana</i> —a	<i>Phyllostegia wawrana</i>	
Kauai 5— <i>Hibiscus clayi</i> —f	<i>Hibiscus clayi</i>	
Kauai 5— <i>Munroidendron racemosum</i> —a	<i>Munroidendron racemosum</i>	
Kauai 6— <i>Brighamia insignis</i> —a	<i>Brighamia insignis</i>	
Kauai 7— <i>Brighamia insignis</i> —b	<i>Brighamia insignis</i>	
Kauai 7— <i>Delissea rhytidosperra</i> —a	<i>Delissea rhytidosperra</i>	
Kauai 7— <i>Isodendron longifolium</i> —a	<i>Isodendron longifolium</i>	
Kauai 7— <i>Lipochaeta micrantha</i> —a	<i>Lipochaeta micrantha</i>	
Kauai 7— <i>Melicope haupuensis</i> —a .....	.....	<i>Melicope haupuensis</i>
Kauai 7— <i>Munroidendron racemosum</i> —b	<i>Munroidendron racemosum</i>	
Kauai 7— <i>Myrsine linearifolia</i> —a .....	.....	<i>Myrsine linearifolia</i>
Kauai 7— <i>Peucedanum sandwicense</i> —a	<i>Peucedanum sandwicense</i>	
Kauai 7— <i>Pteralyxia kauaiensis</i> —a	<i>Pteralyxia kauaiensis</i>	
Kauai 7— <i>Schiedea nuttallii</i> —a	<i>Schiedea nuttallii</i>	
Kauai 8— <i>Sesbania tomentosa</i> —a .....	.....	<i>Sesbania tomentosa</i>
Kauai 9— <i>Schiedea spergulina</i> var. <i>leiopoda</i> —a	<i>Schiedea spergulina</i> var. <i>leiopoda</i>	
Kauai 10— <i>Adenophorus periens</i> —b	<i>Adenophorus periens</i>	
Kauai 10— <i>Bonamia menziesii</i> —a	<i>Bonamia menziesii</i>	
Kauai 10— <i>Cyanea asarifolia</i> —b	<i>Cyanea asarifolia</i>	
Kauai 10— <i>Cyanea remyi</i> —b	<i>Cyanea remyi</i>	
Kauai 10— <i>Cyanea undulata</i> —a	<i>Cyanea undulata</i>	
Kauai 10— <i>Cyrtandra limahuliensis</i> —c	<i>Cyrtandra limahuliensis</i>	
Kauai 10— <i>Dubautia pauciflora</i> —a	<i>Dubautia pauciflora</i>	
Kauai 10— <i>Exocarpos luteolus</i> —a	<i>Exocarpos luteolus</i>	
Kauai 10— <i>Hesperomannia lydgatei</i> —a	<i>Hesperomannia lydgatei</i>	
Kauai 10— <i>Isodendron longifolium</i> —b	<i>Isodendron longifolium</i>	
Kauai 10— <i>Labordia lydgatei</i> —b	<i>Labordia lydgatei</i>	
Kauai 10— <i>Labordia tinifolia</i> var. <i>wahiawaensis</i> —a	<i>Labordia tinifolia</i> var. <i>wahiawaensis</i> .	
Kauai 10— <i>Lysimachia filifolia</i> —a	<i>Lysimachia filifolia</i>	
Kauai 10— <i>Myrsine linearifolia</i> —b	<i>Myrsine linearifolia</i>	
Kauai 10— <i>Phlegmariurus nutans</i> —a .....	.....	<i>Phlegmariurus nutans</i>
Kauai 10— <i>Plantago princeps</i> —a	<i>Plantago princeps</i>	
Kauai 10— <i>Pteralyxia kauaiensis</i> —b	<i>Pteralyxia kauaiensis</i>	
Kauai 10— <i>Viola helenae</i> —a	<i>Viola helenae</i>	
Kauai 10— <i>Viola kauaiensis</i> var. <i>wahiawaensis</i> —a	<i>Viola kauaiensis</i> var. <i>wahiawaensis</i> .	
Kauai 11— <i>Adenophorus periens</i> —c	<i>Adenophorus periens</i>	
Kauai 11— <i>Adenophorus periens</i> —d	<i>Adenophorus periens</i>	
Kauai 11— <i>Alectryon macrococcus</i> —a	<i>Alectryon macrococcus</i>	
Kauai 11— <i>Alectryon macrococcus</i> —b	<i>Alectryon macrococcus</i>	
Kauai 11— <i>Alsinidendron lychnoides</i> —a	<i>Alsinidendron lychnoides</i>	
Kauai 11— <i>Alsinidendron lychnoides</i> —b	11— <i>Alsinidendron lychnoides</i> —a	
Kauai 11— <i>Alsinidendron lychnoides</i> —c .....	.....	<i>Alsinidendron lychnoides</i>
Kauai 11— <i>Alsinidendron viscosum</i> —a	<i>Alsinidendron viscosum</i>	
Kauai 11— <i>Alsinidendron viscosum</i> —b	<i>Alsinidendron viscosum</i>	
Kauai 11— <i>Alsinidendron viscosum</i> —c	<i>Alsinidendron viscosum</i>	
Kauai 11— <i>Alsinidendron viscosum</i> —d	<i>Alsinidendron viscosum</i>	
Kauai 11— <i>Bonamia menziesii</i> —b	<i>Bonamia menziesii</i>	
Kauai 11— <i>Brighamia insignis</i> —c	<i>Brighamia insignis</i>	
Kauai 11— <i>Centaurium sebaeoides</i> —a	<i>Centaurium sebaeoides</i>	
Kauai 11— <i>Chamaesyce halemanui</i> —a .....	.....	<i>Chamaesyce halemanui</i>
Kauai 11— <i>Chamaesyce halemanui</i> —b	<i>Chamaesyce halemanui</i>	
Kauai 11— <i>Chamaesyce halemanui</i> —c	<i>Chamaesyce halemanui</i>	
Kauai 11— <i>Ctenitis squamigera</i> —a .....	.....	<i>Ctenitis squamigera</i>
Kauai 11— <i>Cyanea recta</i> —c	<i>Cyanea recta</i>	
Kauai 11— <i>Cyanea recta</i> —d .....	.....	<i>Cyanea recta</i>
Kauai 11— <i>Cyanea remyi</i> —c	<i>Cyanea remyi</i>	
Kauai 11— <i>Cyanea remyi</i> —d	<i>Cyanea remyi</i>	
Kauai 11— <i>Cyperus trachysanthos</i> —a	<i>Cyperus trachysanthos</i>	
Kauai 11— <i>Cyrtandra cyaneoides</i> —b	<i>Cyrtandra cyaneoides</i>	
Kauai 11— <i>Cyrtandra cyaneoides</i> —c	<i>Cyrtandra cyaneoides</i>	
Kauai 11— <i>Cyrtandra limahuliensis</i> —d	<i>Cyrtandra limahuliensis</i>	
Kauai 11— <i>Cyrtandra limahuliensis</i> —e	<i>Cyrtandra limahuliensis</i>	
Kauai 11— <i>Delissea rhytidosperra</i> —b	<i>Delissea rhytidosperra</i>	
Kauai 11— <i>Delissea rhytidosperra</i> —c .....	.....	<i>Delissea rhytidosperra</i>
Kauai 11— <i>Delissea rivularis</i> —a	<i>Delissea rivularis</i>	
Kauai 11— <i>Delissea undulata</i> —a .....	.....	<i>Delissea undulata</i>

(CCXVIII) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR KAUAI—Continued

Unit name	Species occupied	Species unoccupied
Kauai 11— <i>Delissea undulata</i> —b	<i>Delissea undulata</i>	
Kauai 11— <i>Diellia erecta</i> —a		<i>Diellia erecta</i>
Kauai 11— <i>Diellia pallida</i> —a	<i>Diellia pallida</i>	
Kauai 11— <i>Diellia pallida</i> —b	<i>Diellia pallida</i>	
Kauai 11— <i>Diplazium molokaiense</i> —a		<i>Diplazium molokaiense</i>
Kauai 11— <i>Dubautia latifolia</i> —1		<i>Dubautia latifolia</i>
Kauai 11— <i>Dubautia latifolia</i> —b	<i>Dubautia latifolia</i>	
Kauai 11— <i>Dubautia latifolia</i> —c	<i>Dubautia latifolia</i>	
Kauai 11— <i>Euphorbia haelealeana</i> —a	<i>Euphorbia haelealeana</i>	
Kauai 11— <i>Euphorbia haelealeana</i> —b	<i>Euphorbia haelealeana</i>	
Kauai 11— <i>Euphorbia haelealeana</i> —c	<i>Euphorbia haelealeana</i>	
Kauai 11— <i>Exocarpos luteolus</i> —b	<i>Exocarpos luteolus</i>	
Kauai 11— <i>Exocarpos luteolus</i> —c	<i>Exocarpos luteolus</i>	
Kauai 11— <i>Exocarpos luteolus</i> —d	<i>Exocarpos luteolus</i>	
Kauai 11— <i>Exocarpos luteolus</i> —e	<i>Exocarpos luteolus</i>	
Kauai 11— <i>Flueggea neowawraea</i> —a		<i>Flueggea neowawraea</i>
Kauai 11— <i>Flueggea neowawraea</i> —b	<i>Flueggea neowawraea</i>	
Kauai 11— <i>Flueggea neowawraea</i> —c	<i>Flueggea neowawraea</i>	
Kauai 11— <i>Flueggea neowawraea</i> —d	<i>Flueggea neowawraea</i>	
Kauai 11— <i>Flueggea neowawraea</i> —e	<i>Flueggea neowawraea</i>	
Kauai 11— <i>Flueggea neowawraea</i> —f	<i>Flueggea neowawraea</i>	
Kauai 11— <i>Gouania meyenii</i> —a		<i>Gouania meyenii</i>
Kauai 11— <i>Gouania meyenii</i> —b	<i>Gouania meyenii</i>	
Kauai 11— <i>Gouania meyenii</i> —c		<i>Gouania meyenii</i>
Kauai 11— <i>Hedyotis cookiana</i> —a	<i>Hedyotis cookiana</i>	
Kauai 11— <i>Hedyotis st. johnii</i> —a	<i>Hedyotis st. johnii</i>	
Kauai 11— <i>Hesperomannia lydgatei</i> —b	<i>Hesperomannia lydgatei</i>	
Kauai 11— <i>Hesperomannia lydgatei</i> —e	<i>Hesperomannia lydgatei</i>	
Kauai 11— <i>Hibiscadelphus woodii</i> —a	<i>Hibiscadelphus woodii</i>	
Kauai 11— <i>Hibiscadelphus woodii</i> —b	<i>Hibiscadelphus woodii</i>	
Kauai 11— <i>Hibiscus waimeae</i> ssp. <i>hannerae</i> —a	<i>Hibiscus waimeae</i> ssp. <i>hannerae</i>	
Kauai 11— <i>Ischaemum byrone</i> —d		<i>Ischaemum byrone</i>
Kauai 11— <i>Isodendron laurifolium</i> —a	<i>Isodendron laurifolium</i>	
Kauai 11— <i>Isodendron laurifolium</i> —b	<i>Isodendron laurifolium</i>	
Kauai 11— <i>Isodendron longifolium</i> —c	<i>Isodendron longifolium</i>	
Kauai 11— <i>Isodendron longifolium</i> —d	<i>Isodendron longifolium</i>	
Kauai 11— <i>Isodendron longifolium</i> —e	<i>Isodendron longifolium</i>	
Kauai 11— <i>Kokia kauaiensis</i> —a	<i>Kokia kauaiensis</i>	
Kauai 11— <i>Kokia kauaiensis</i> —b	<i>Kokia kauaiensis</i>	
Kauai 11— <i>Kokia kauaiensis</i> —c	<i>Kokia kauaiensis</i>	
Kauai 11— <i>Kokia kauaiensis</i> —d	<i>Kokia kauaiensis</i>	
Kauai 11— <i>Labordia lydgatei</i> —c	<i>Labordia lydgatei</i>	
Kauai 11— <i>Labordia lydgatei</i> —d	<i>Labordia lydgatei</i>	
Kauai 11— <i>Labordia lydgatei</i> —e	<i>Labordia lydgatei</i>	
Kauai 11— <i>Lipochaeta fauriei</i> —a		<i>Lipochaeta fauriei</i>
Kauai 11— <i>Lipochaeta fauriei</i> —b	<i>Lipochaeta fauriei</i>	
Kauai 11— <i>Lipochaeta micrantha</i> —b	<i>Lipochaeta micrantha</i>	
Kauai 11— <i>Lobelia niihauensis</i> —a		<i>Lobelia niihauensis</i>
Kauai 11— <i>Lobelia niihauensis</i> —b	<i>Lobelia niihauensis</i>	
Kauai 11— <i>Mariscus pennatiformis</i> —a		<i>Mariscus pennatiformis</i>
Kauai 11— <i>Melicope haupuensis</i> —b	<i>Melicope haupuensis</i>	
Kauai 11— <i>Melicope haupuensis</i> —c	<i>Melicope haupuensis</i>	
Kauai 11— <i>Melicope knudsenii</i> —a	<i>Melicope knudsenii</i>	
Kauai 11— <i>Melicope knudsenii</i> —b	<i>Melicope knudsenii</i>	
Kauai 11— <i>Melicope pallida</i> —a	<i>Melicope pallida</i>	
Kauai 11— <i>Melicope pallida</i> —b	<i>Melicope pallida</i>	
Kauai 11— <i>Munroidendron racemosum</i> —c	<i>Munroidendron racemosum</i>	
Kauai 11— <i>Munroidendron racemosum</i> —d	<i>Munroidendron racemosum</i>	
Kauai 11— <i>Myrsine linearifolia</i> —c	<i>Myrsine linearifolia</i>	
Kauai 11— <i>Myrsine linearifolia</i> —d	<i>Myrsine linearifolia</i>	
Kauai 11— <i>Myrsine linearifolia</i> —e	<i>Myrsine linearifolia</i>	
Kauai 11— <i>Myrsine linearifolia</i> —f	<i>Myrsine linearifolia</i>	
Kauai 11— <i>Nothocestrum peltatum</i> —a		<i>Nothocestrum peltatum</i>
Kauai 11— <i>Nothocestrum peltatum</i> —b	<i>Nothocestrum peltatum</i>	
Kauai 11— <i>Nothocestrum peltatum</i> —c	<i>Nothocestrum peltatum</i>	
Kauai 11— <i>Peucedanum sandwicense</i> —b	<i>Peucedanum sandwicense</i>	
Kauai 11— <i>Peucedanum sandwicense</i> —c	<i>Peucedanum sandwicense</i>	
Kauai 11— <i>Phyllostegia knudsenii</i> —a	<i>Phyllostegia knudsenii</i>	
Kauai 11— <i>Phyllostegia waimeae</i> —a	<i>Phyllostegia waimeae</i>	
Kauai 11— <i>Phyllostegia wawrana</i> —b	<i>Phyllostegia wawrana</i>	
Kauai 11— <i>Phyllostegia wawrana</i> —c	<i>Phyllostegia wawrana</i>	
Kauai 11— <i>Phyllostegia wawrana</i> —d	<i>Phyllostegia wawrana</i>	

2427553; 384706, 2427627; 384746, 2427670; 384750, 2427684; 384766, 2427695; 384924, 2427730; 384995, 2427744; 384993, 2427821; 385066, 2427920; 385143, 2427974; 385186, 2428008; 385291, 2428014; 385421, 2428023; 385500, 2428057; 385605, 2428131; 385614, 2428162; 385546, 2428162; 385509, 2428133; 385435, 2428142; 385410, 2428184; 385415, 2428238; 385478, 2428278; 385597, 2428312; 385679, 2428287; 385801, 2428267; 385903, 2428282; 385977, 2428333; 386111, 2428376; 386173, 2428412; 386264, 2428364; 386326, 2428328; 386482, 2428317; 386530, 2428342; 386440, 2428385; 386428, 2428419; 386471, 2428436; 386539, 2428453; 386582, 2428467; 386732, 2428498; 386811, 2428496; 386814, 2428500; 386959, 2428247; 387475, 2427909; 387322, 2427686; 386416, 2427981; 386362, 2427840; 386256, 2427750; 386010, 2427731; 386042, 2427438; 385897, 2427457; 385678, 2427367; 385116, 2427542. return to starting point.

(B) Note: Map 218 follows:



(II) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR NIIHAU

Unit name	Species occupied	Species unoccupied
Niihau 1— <i>Brighamia insignis</i> —a	<i>Brighamia insignis</i>	

(b) *Plants on Kauai and Niihau; Constituent elements.*

(1) *Flowering Plants.*

Family Apiaceae: *Peucedanum sandwicense* (makou)

Kauai 7—*Peucedanum sandwicense*—a, Kauai 11—*Peucedanum sandwicense*—b, and Kauai 11—*Peucedanum sandwicense*—c, identified in the legal descriptions in paragraph (a)(1) of this section, constitute critical habitat for *Peucedanum sandwicense* on Kauai. Within these units, the currently known primary constituent elements of critical

habitat include, but are not limited to, the habitat components provided by:

- (i) Cliff habitats in mixed shrub coastal dry cliff communities or diverse mesic forest and containing one or more of the following associated native plant species: *Acacia koa*, *Artemisia australis*, *Bidens* spp., *Brighamia insignis*, *Carex meyenii*, *Chamaesyce celastroides*, *Diospyros* spp., *Dodonaea viscosa*, *Eragrostis variabilis*, *Hibiscus kokio*, *Lobelia niihauensis*, *Metrosideros polymorpha*, *Panicum lineale*, *Psychodra odorata*, *Psychotria* spp., or *Wilkesia* spp.; and
- (ii) Elevations between 119 and 1,232 m (391 and 4,041 ft).

Family Apiaceae: *Spermolepis hawaiiensis* (NCN)

Kauai 11—*Spermolepis hawaiiensis*—a, Kauai 13—*Spermolepis hawaiiensis*—b, and Kauai 13—*Spermolepis hawaiiensis*—c, identified in the legal descriptions in paragraph (a)(1) of this section, constitute critical habitat for *Spermolepis hawaiiensis* on Kauai. 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* forests or *Dodonaea viscosa* lowland dry shrubland and containing one or more of the following associated plant

species: *Bidens sandwicensis*, *Doryopteris* spp., *Eragrostis variabilis*, *Erythrina sandwicensis*, *Lipochaeta* spp., *Schiedea spergulina*, or *Sida fallax*; and

(ii) Elevations between 56 and 662 m (184 and 2,172 ft).

Family Apocynaceae: *Pteralyxia kauaiensis* (kauai)

Kauai 7—*Pteralyxia kauaiensis*—a, Kauai 10—*Pteralyxia kauaiensis*—b, Kauai 11—*Pteralyxia kauaiensis*—c, Kauai 11—*Pteralyxia kauaiensis*—d, Kauai 11—*Pteralyxia kauaiensis*—e, Kauai 11—*Pteralyxia kauaiensis*—f, and Kauai 11—*Pteralyxia kauaiensis*—g, identified in the legal descriptions in paragraph (a)(1) of this section, constitute critical habitat for *Pteralyxia kauaiensis* on Kauai. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Diverse mesic or *Diospyros sandwicensis* mixed mesic forests with *Pisonia* spp. and containing one or more of the following associated plant species: *Acacia koa*, *Alectryon macrococcus*, *Alphitonia ponderosa*, *Antidesma platyphyllum* var. *hillebrandii*, *Bobea brevipes*, *Carex* spp., *Charpentiera elliptica*, *Claoxylon sandwicense*, *Cyanea* spp., *Dianella sandwicensis*, *Diospyros* spp., *Dodonaea viscosa*, *Diplazium sandwichianum*, *Euphorbia haelealeana*, *Freycinetia arborea*, *Gahnia* spp., *Gardenia remyi*, *Hedyotis terminalis*, *Hibiscus kokio*, *Kokia kauaiensis*, *Leptecophylla tameiameia*, *Metrosideros polymorpha*, *Myrsine lanaiensis*, *Neraudia* spp., *Nesoluma polynesicum*, *Nestegis sandwicensis*, *Peperomia* spp., *Pisonia sandwicensis*, *Pipturus* spp., *Pleomele aurea*, *Poa sandwicensis*, *Pouteria sandwicensis*, *Pritchardia* spp., *Psydrax odorata*, *Psychotria* spp., *Rauvolfia sandwicensis*, *Santalum freycinetianum* var. *pyrularium*, *Schiedea* spp., *Syzygium sandwicensis*, *Tetraplasandra* spp., *Xylosma hawaiiense*, or *Zanthoxylum dipetalum*; and

(ii) Elevations between 127 and 1,563 m (418 and 5,128 ft).

Family Araliaceae: *Munroidendron racemosum* (NCN)

Kauai 5—*Munroidendron racemosum*—a, Kauai 7—*Munroidendron racemosum*—b, Kauai 11—*Munroidendron racemosum*—c, and Kauai 11—*Munroidendron racemosum*—d, identified in the legal descriptions in paragraph (a)(1) of this section, constitute critical habitat for *Munroidendron racemosum* on Kauai. 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 exposed cliffs or ridge slopes in coastal or lowland mesic forest and containing one or more of the following associated plant species: *Bobea brevipes*, *Brighamia insignis*, *Canavalia napaliensis*, *Diospyros sandwicensis*, *Diospyros hillebrandii*, *Nestegis sandwicensis*, *Pisonia sandwicensis*, *Pisonia umbellifera*, *Pleomele aurea*, *Pouteria sandwicensis*, *Psychotria* spp., *Psydrax odorata*, *Rauvolfia sandwicensis*, *Schiedea* spp., *Sida fallax*, or *Tetraplasandra* spp.; and

(ii) Elevations between 11 and 938 m (37 and 3,077 ft).

Family Asteraceae: *Dubautia latifolia* (naenae)

Kauai 11—*Dubautia latifolia*—a, Kauai 11—*Dubautia latifolia*—b, and Kauai 11—*Dubautia latifolia*—c, identified in the legal descriptions in paragraph (a)(1) of this section, constitute critical habitat for *Dubautia latifolia* on Kauai. 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 or steep slopes on well drained soil in semi-open or closed, diverse montane mesic forest dominated by *Acacia koa* and/or *Metrosideros polymorpha* and containing one or more of the following native plant species: *Alphitonia ponderosa*, *Antidesma platyphyllum*, *Bobea* spp., *Claoxylon sandwicense*, *Coprosma waimeae*, *Cyrtandra* spp., *Dicranopteris linearis*, *Diplazium sandwichianum*, *Dodonaea viscosa*, *Elaeocarpus bifidus*, *Hedyotis terminalis*, *Ilex anomala*, *Melicope anisata*, *Nestegis sandwicensis*, *Pleomele aurea*, *Pouteria sandwicensis*, *Psychotria mariniana*, *Scaevola* spp., or *Xylosma* spp.; and

(ii) Elevations between 545 and 1,277 m (1,786 and 4,189 ft).

Family Asteraceae: *Dubautia pauciflorula* (naenae)

Kauai 10—*Dubautia pauciflorula*—a, identified in the legal description in paragraph (a)(1) of this section, constitutes critical habitat for *Dubautia pauciflorula* on Kauai. Within this unit, 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* lowland wet forest within stream drainages containing one or more of the following associated native plant species: *Antidesma platyphyllum*, *Broussaisia*

arguta, *Cheirodendron* spp., *Dubautia laxa*, *Embelia pacifica*, *Hesperomannia lydgatei*, *Labordia waialealae*, *Melicope* spp., *Nothoperanema rubiginosa*, *Pritchardia* spp., *Psychotria* spp., *Sadleria* spp., *Scaevola mollis*, *Syzygium sandwicensis*, or *Tetraplasandra* spp.; and

(ii) Elevations between 564 and 1,094 m (1,849 and 3,587 ft).

Family Asteraceae: *Hesperomannia lydgatei* (NCN)

Kauai 10—*Hesperomannia lydgatei*—a, Kauai 11—*Hesperomannia lydgatei*—b, and Kauai 11—*Hesperomannia lydgatei*—c, identified in the legal descriptions in paragraph (a)(1) of this section, constitute critical habitat for *Hesperomannia lydgatei* on Kauai. 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 and forested slopes in rich brown soil and silty clay in *Metrosideros polymorpha* or *Metrosideros polymorpha-Dicranopteris linearis* lowland wet forest and containing one or more of the following associated native plant species: *Adenophorus periens*, *Antidesma platyphyllum*, *Broussaisia arguta*, *Cheirodendron* spp., *Cyanea* spp., *Dubautia knudsenii*, *Dubautia laxa*, *Dubautia pauciflorula*, *Dubautia raillardoides*, *Elaphoglossum* spp., *Freycinetia arborea*, *Hedyotis terminalis*, *Labordia lydgatei*, *Machaerina angustifolia*, *Peperomia* spp., *Pritchardia* spp., *Psychotria hexandra*, or *Syzygium sandwicensis*; and

(ii) Elevations between 207 and 1,344 m (680 and 4,409 ft).

Family Asteraceae: *Lipochaeta fauriei* (nehe)

Kauai 11—*Lipochaeta fauriei*—a, and Kauai 11—*Lipochaeta fauriei*—b, identified in the legal descriptions in paragraph (a)(1) of this section, constitute critical habitat for *Lipochaeta fauriei* on Kauai. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Moderate shade to full sun on the sides of steep gulches in diverse lowland mesic forests and containing one or more of the following native species: *Acacia koa*, *Carex meyenii*, *Carex wahuensis*, *Dicranopteris linearis*, *Diospyros* spp., *Dodonaea viscosa*, *Euphorbia haelealeana*, *Hibiscus waimeae*, *Kokia kauaiensis*, *Myrsine lanaiensis*, *Nestegis sandwicensis*, *Pleomele aurea*, *Psychotria*

greenwelliae, *Psychotria mariniana*, or *Sapindus oahuensis*; and

(ii) Elevations between 438 and 948 m (1,438 and 3,108 ft).

Family Asteraceae: *Lipochaeta micrantha* (nehe)

Kauai 7—*Lipochaeta micrantha*—a, and Kauai 11—*Lipochaeta micrantha*—b, identified in the legal descriptions in paragraph (a)(1) of this section, constitute critical habitat for *Lipochaeta micrantha* on Kauai. Within these units the currently known primary constituent elements of critical habitat for *Lipochaeta micrantha* are the habitat components provided by:

(i) Cliffs, ridges, stream banks, or slopes in mesic to wet mixed communities and containing one or more of the following associated native plant species: *Acacia koa*, *Antidesma* spp., *Artemisia australis*, *Bidens sandwicensis*, *Bobea* spp., *Chamaesyce celastroides* var. *hanapepensis*, *Diospyros* spp., *Dodonaea viscosa*, *Eragrostis grandis*, *Eragrostis variabilis*, *Hibiscus kokio*, *Lepidium bidentatum*, *Lobelia niihauensis*, *Melicope* spp., *Metrosideros polymorpha*, *Neraudia kauaiensis*, *Nototrichium* spp., *Pipturus* spp., *Plectranthus parviflorus*, *Pleomele aurea*, *Psydrax odorata*, *Rumex albescens*, *Sida fallax*, or *Xylosma hawaiiense*; and

(ii) Elevations between 127 and 1,090 m (418 and 3,574 ft).

Family Asteraceae: *Lipochaeta waimeae* (nehe)

Kauai 13—*Lipochaeta waimeae*—a, identified in the legal description in paragraph (a)(1) of this section, constitutes critical habitat for *Lipochaeta waimeae* on Kauai.

Within this unit, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Precipitous, shrub-covered gulches in diverse lowland forest and containing one or more of the following associated native plant species: *Artemisia australis*, *Chamaesyce celastroides*, *Dodonaea viscosa*, *Lipochaeta connata*, *Santalum freycinetianum*, *Schiedea spargulina*, or *Panicum* spp.; and

(ii) Elevations between 44 and 409 m (145 and 1,340 ft).

Family Asteraceae: *Remya kauaiensis* (NCN)

Kauai 11—*Remya kauaiensis*—a, Kauai 11—*Remya kauaiensis*—b, Kauai 11—*Remya kauaiensis*—c, Kauai 11—*Remya kauaiensis*—d, Kauai 11—*Remya kauaiensis*—e, and Kauai 12—*Remya kauaiensis*—f, identified in the legal descriptions in paragraph (a)(1) of this

section, constitute critical habitat for *Remya kauaiensis* on Kauai. 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 *Acacia koa*-*Metrosideros polymorpha* lowland mesic forest and containing one or more of the following associated native plant species:

Chamaesyce spp., *Claoxylon sandwicense*, *Dianella sandwicensis*, *Diospyros* spp., *Dodonaea viscosa*, *Hedyotis terminalis*, *Melicope* spp., *Nestegis sandwicensis*, *Pouteria sandwicensis*, *Psychotria* spp., *Schiedea* spp., or *Tetraplasandra* spp.; and

(ii) Elevations between 560 and 1,249 m (1,836 and 4,097 ft).

Family Asteraceae: *Remya montgomeryi* (NCN)

Kauai 11—*Remya montgomeryi*—a, Kauai 11—*Remya montgomeryi*—b, and Kauai 11—*Remya montgomeryi*—c, identified in the legal descriptions in paragraph (a)(1) of this section, constitute critical habitat for *Remya montgomeryi* on Kauai. 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 or cliffs in transitional wet or *Metrosideros polymorpha*-dominated mixed mesic forest and containing one or more of the following associated native plant species: *Artemisia australis*, *Bobea* spp., *Boehmeria grandis*, *Cheirodendron* spp., *Claoxylon sandwicense*, *Cyrtandra* spp., *Dubautia* spp., *Ilex anomala*, *Lepidium serra*, *Lysimachia* spp., *Myrsine linearifolia*, *Nototrichium* spp., *Pleomele aurea*, *Poa mannii*, *Sadleria* spp., *Scaevola* spp., *Stenogyne campanulata*, *Tetraplasandra* spp., or *Zanthoxylum dipetalum*; and

(ii) Elevations between 336 and 1,345 m (1,102 and 4,411 ft).

Family Asteraceae: *Wilkesia hobbdi* (dwarf iliau)

Kauai 11—*Wilkesia hobbdi*—a, identified in the legal description in paragraph (a)(1) of this section, constitutes critical habitat for *Wilkesia hobbdi* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Coastal dry cliffs or very dry ridges containing one or more of the following associated native plant species:

Artemisia australis, *Dodonaea viscosa*, *Eragrostis variabilis*, *Hibiscus kokio* ssp.

saint johnianus, *Lipochaeta connata*, *Lobelia niihauensis*, *Myoporum sandwicense*, *Peperomia blanda*, *Peperomia* spp., *Peperomia tetraphylla*, *Peucedanum sandwicense*, *Psydrax odorata*, *Sida fallax*, *Waltheria indica*, or *Wilkesia gymnoxiphium*; and

(ii) Elevations between 12 and 685 m (40 and 2,246 ft).

Family Campanulaceae: *Brighamia insignis* (olulu)

Kauai 6—*Brighamia insignis*—a, Kauai 7—*Brighamia insignis*—b, and Kauai 11—*Brighamia insignis*—c identified in the legal descriptions in paragraph (a)(1) of this section, and Niihau 1—*Brighamia insignis*—a, identified in the legal description in paragraph (a)(2) of this section, constitute critical habitat for *Brighamia insignis* on Kauai and Niihau. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Rocky ledges with little soil or steep sea cliffs in lowland dry grasslands or shrublands with annual rainfall that is usually less than 170 cm (65 in) and containing one or more of the following native plant species: *Artemisia australis*, *Chamaesyce celastroides*, *Eragrostis variabilis*, *Heteropogon contortus*, *Hibiscus kokio*, *Hibiscus kokio* ssp. *saintjohnianus*, *Lepidium serra*, *Lipochaeta succulenta*, *Munroidendron racemosum*, or *Sida fallax*; and

(ii) Elevations between 0 and 748 m (0 and 2,453 ft).

Family Campanulaceae: *Cyanea asarifolia* (haha)

Kauai 4—*Cyanea asarifolia*—a, and Kauai 10—*Cyanea asarifolia*—b, identified in the legal descriptions in paragraph (a)(1) of this section, constitute critical habitat for *Cyanea asarifolia* on Kauai. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Pockets of soil on sheer wet rock cliffs and waterfalls in lowland wet forests and containing one or more of the following native plant species: *Bidens* spp., *Dubautia plantaginea*, *Hedyotis centranthoides*, *Hedyotis elatior*, *Lysimachia filifolia*, *Machaerina angustifolia*, *Metrosideros polymorpha*, or *Panicum lineale*; and

(ii) Elevations between 182 and 1,212 m (597 and 3,976 ft).

Family Campanulaceae: *Cyanea recta* (haha)

Kauai 4—*Cyanea recta*—a, Kauai 4—*Cyanea recta*—b, Kauai 11—*Cyanea recta*—c, and Kauai 11—*Cyanea recta*—d, identified in the legal descriptions in paragraph (a)(1) of this section, constitute critical habitat for *Cyanea recta* on Kauai. 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 slopes in lowland wet or mesic *Metrosideros polymorpha* forest or shrubland and containing one or more of the following native plant species: *Antidesma platyphyllum*, *Cheirodendron platyphyllum*, *Cibotium* spp., *Dicranopteris linearis*, *Diplazium* spp., or *Psychotria* spp.; and
- (ii) Elevations between 297 and 1,345 m (975 and 4,411 ft).

Family Campanulaceae: *Cyanea remyi* (haha)

Kauai 4—*Cyanea remyi*—a, Kauai 10—*Cyanea remyi*—b, Kauai 11—*Cyanea remyi*—c, and Kauai 11—*Cyanea remyi*—d, identified in the legal descriptions in paragraph (a)(1) of this section, constitute critical habitat for *Cyanea remyi* on Kauai. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

- (i) Narrow drainages and wet stream banks in lowland wet forest or shrubland and containing one or more of the following native plant species: various grammitid and filmy ferns (Grammitidaceae and Hymenophyllaceae), *Adenophorus* spp., *Antidesma platyphyllum*, *Bidens* spp., *Broussaisia arguta*, *Cheirodendron* spp., *Cyrtandra* spp., *Diplazium sandwichianum*, *Eragrostis grandis*, *Freycinetia arborea*, *Hedyotis terminalis*, *Machaerina angustifolia*, *Metrosideros polymorpha*, *Perrottetia sandwicensis*, *Pipturus* spp., *Psychotria hexandra*, *Syzygium sandwicensis*, *Thelypteris* spp., *Touchardia latifolia*, or *Urera glabra*; and
- (ii) Elevations between 219 and 1,089 m (719 and 3,571 ft).

Family Campanulaceae: *Cyanea undulata* (haha)

Kauai 10—*Cyanea undulata*—a, identified in the legal description in paragraph (a)(1) of this section, constitutes critical habitat for *Cyanea undulata* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

- (i) Narrow drainages and wet stream banks in *Metrosideros polymorpha* dry to montane wet forest or shrubland and containing one or more of the following associated native species: various grammitid and filmy ferns (Grammitidaceae and Hymenophyllaceae), *Adenophorus* spp., *Antidesma platyphyllum*, *Bidens* spp., *Broussaisia arguta*, *Cheirodendron* spp., *Diplazium sandwichianum*, *Dryopteris glabra*, *Eragrostis grandis*, *Freycinetia arborea*, *Machaerina angustifolia*, *Mariscus* spp., *Melicope feddei*, *Perrottetia sandwicensis*, *Pipturus* spp., *Psychotria hexandra*, *Psychotria mariniana*, *Sadleria pallida*, *Sadleria squarrosa*, *Smilax melastomifolia*, *Sphenomeris chinensis*, *Syzygium sandwicensis*, or *Thelypteris* spp.; and
- (ii) Elevations between 375 and 1,046 m (1,231 and 3,430 ft).

Family Campanulaceae: *Delissea rhytidosperra* (no common name)

Kauai 7—*Delissea rhytidosperra*—a, Kauai 11—*Delissea rhytidosperra*—b, and Kauai 11—*Delissea rhytidosperra*—c, identified in the legal descriptions in paragraph (a)(1) of this section, constitute critical habitat for *Delissea rhytidosperra* on Kauai. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

- (i) Well-drained soils with medium or fine-textured subsoil in *Diospyros* diverse lowland mesic forests or diverse *Metrosideros polymorpha*-*Acacia koa* forests and containing one or more of the following native species: *Adenophorus* spp., *Cyanea* spp., *Dianella sandwicensis*, *Diospyros sandwicensis*, *Dodonaea viscosa*, *Doodia kunthiana*, *Euphorbia haeleleana*, grammitid ferns (Grammitidaceae), *Hedyotis* spp., *Leptecophylla tameiameia*, *Microlepia strigosa*, *Nestegis sandwicensis*, *Pisonia* spp., *Psychotria hobydi*, or *Pteralyxia kauaiensis*; and
- (ii) Elevations between 167 and 895 m (547 and 2,935 ft).

Family Campanulaceae: *Delissea rivularis* (oha)

Kauai 11—*Delissea rivularis*—a, identified in the legal description in paragraph (a)(1) of this section, constitutes critical habitat for *Delissea rivularis* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

- (i) Steep slopes near streams in *Metrosideros polymorpha*-*Cheirodendron trigynum* montane wet

or mesic forest and containing one or more of the following native plant species: *Boehmeria grandis*, *Broussaisia arguta*, *Carex* spp., *Coprosma* spp., *Diplazium sandwichianum*, *Dubautia knudsenii*, *Hedyotis foggiana*, *Ilex anomala*, *Machaerina angustifolia*, *Melicope anisata*, *Melicope clusiifolia*, *Pipturus* spp., *Psychotria hexandra*, or *Sadleria* spp.; and

- (ii) Elevations between 823 and 1,307 m (2,701 and 4,286 ft).

Family Campanulaceae: *Delissea undulata* (NCN)

Kauai 11—*Delissea undulata*—a, and Kauai 11—*Delissea undulata*—b, identified in the legal descriptions in paragraph (a)(1) of this section, constitute critical habitat for *Delissea undulata* on Kauai. 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 open *Acacia koa*-*Metrosideros polymorpha* mesic forests or *Alphitonia ponderosa* montane forest and containing one or more of the following native plant species: *Diospyros sandwicensis*, *Dodonaea viscosa*, *Doodia kunthiana*, *Eragrostis variabilis*, *Euphorbia haeleleana*, *Kokia kauaiensis*, *Microlepia strigosa*, *Panicum* spp., *Pleomele aurea*, *Psychotria mariniana*, *Psychotria greenwelliae*, or *Santalum freycinetianum*; and
- (ii) Elevations between 139 and 1,006 m (456 and 3,299 ft).

Family Campanulaceae: *Lobelia niihauensis* (NCN)

Kauai 11—*Lobelia niihauensis*—a, and Kauai 11—*Lobelia niihauensis*—b, identified in the legal descriptions in paragraph (a)(1) of this section, constitute critical habitat for *Lobelia niihauensis* on Kauai. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

- (i) Exposed mesic mixed shrubland or coastal dry cliffs and containing one or more of the following associated native plant species: *Artemisia australis*, *Bidens sandwicensis*, *Chamaesyce celastroides*, *Charpentiera* spp., *Eragrostis variabilis*, *Hibiscus kokio* ssp. *saint-johnianus*, *Lipochaeta connata* var. *acris*, *Lythrum* spp., *Nototrichium* spp., *Plectranthus parviflorus*, *Schiedea apokremnos*, or *Wilkesia hobydi*; and
- (ii) Elevations between 36 and 888 m (117 and 2,911 ft).

Family Caryophyllaceae:
Alsinidendron lychnoides
(kuawawaenohu)

Kauai 11—*Alsinidendron lychnoides*—a, Kauai 11—*Alsinidendron lychnoides*—b, and Kauai 11—*Alsinidendron lychnoides*—c, identified in the legal descriptions in paragraph (a)(1) of this section, constitute critical habitat for *Alsinidendron lychnoides* on Kauai. 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 riparian clay or silty soil banks in montane wet forests dominated by *Metrosideros polymorpha* and *Cheirodendron* spp., or by *Metrosideros polymorpha* and *Dicranopteris linearis* and containing one or more of the following native plant species: *Asplenium* spp., *Astelia* spp., *Broussaisia arguta*, *Carex* spp., *Cyrtandra* spp., *Diplazium sandwichianum*, *Elaphoglossum* spp., *Hedyotis terminalis*, *Machaerina* spp., *Peperomia* spp., or *Vaccinium* spp.; and
- (ii) Elevations between 828 and 1,344 m (2,715 and 4,408 ft).

Family Caryophyllaceae:
***Alsinidendron viscosum* (NCN)**

Kauai 11—*Alsinidendron viscosum*—a, Kauai 11—*Alsinidendron viscosum*—b, Kauai 11—*Alsinidendron viscosum*—c, and Kauai 11—*Alsinidendron viscosum*—d, identified in the legal descriptions in paragraph (a)(1) of this section, constitute critical habitat for *Alsinidendron viscosum* on Kauai. 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 in *Acacia koa*-*Metrosideros polymorpha* lowland and montane mesic forest and containing one or more of the following native plant species: *Alyxia oliviformis*, *Asplenium polyodon*, *Bidens cosmoides*, *Bobea* spp., *Carex meyenii*, *Carex wahuensis*, *Coprosma* spp., *Dianella sandwicensis*, *Dodonaea viscosa*, *Doodia kunthiana*, *Dryopteris glabra*, *Dryopteris unidentata*, *Dryopteris wallichiana*, *Dubautia laevigata*, *Gahnia* spp., *Ilex anomala*, *Melicope* spp., *Panicum nephelophilum*, *Pleomele aurea*, *Psychotria* spp., *Pteridium aquilinum* var. *decompositum*, *Schiedea stellarioides*, or *Vaccinium dentatum*; and
- (ii) Elevations between 754 and 1,224 m (2,474 and 4,016 ft).

Family Caryophyllaceae: *Schiedea apokremnos* (maolioli)

Kauai 11—*Schiedea apokremnos*—a, Kauai 11—*Schiedea apokremnos*—b, and Kauai 11—*Schiedea apokremnos*—c, identified in the legal descriptions in paragraph (a)(1) of this section, constitute critical habitat for *Schiedea apokremnos* on Kauai. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

- (i) Crevices of near-vertical basalt coastal cliff faces in sparse dry coastal cliff shrub vegetation and containing one or more of the following associated native plant species: *Artemisia australis*, *Bidens* spp., *Carex meyenii*, *Chamaesyce celastroides*, *Eragrostis variabilis*, *Lepidium serra*, *Lipochaeta connata*, *Lobelia niihauensis*, *Myoporum sandwicense*, *Peperomia* spp., *Pleomele aurea*, *Psydrax odorata*, or *Wilkesia* spp.; and
- (ii) Elevations between 11 and 538 m (35 and 1,765 ft).

Family Caryophyllaceae: *Schiedea helleri* (NCN)

Kauai 11—*Schiedea helleri*—a, Kauai 11—*Schiedea helleri*—b, and Kauai 11—*Schiedea helleri*—c, identified in the legal descriptions in paragraph (a)(1) of this section, constitute critical habitat for *Schiedea helleri* on Kauai. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

- (i) Ridges and steep cliffs in closed *Metrosideros polymorpha*-*Dicranopteris linearis* montane wet forest, *M. polymorpha*-*Cheirodendron* spp. montane wet forest, or *Acacia koa*-*M. polymorpha* montane mesic forest and containing one or more of the following associated native plant species: *Broussaisia arguta*, *Cheirodendron* spp., *Cibotium* spp., *Cyanea* spp., *Dianella sandwicensis*, *Dubautia* spp., *Elaeocarpus bifidus*, *Hedyotis terminalis*, *Melicope* spp., *Myrsine* spp., *Poa sandwicensis*, *Scaevola procera*, *Syzygium sandwicensis*, or *Viola wailenalanae*; and
- (ii) Elevations between 664 and 1,361 m (2,178 and 4,464 ft).

Family Caryophyllaceae: *Schiedea kauaiensis* (NCN)

Kauai 11—*Schiedea kauaiensis*—a, Kauai 11—*Schiedea kauaiensis*—b, Kauai 11—*Schiedea kauaiensis*—c, and Kauai 11—*Schiedea kauaiensis*—d, identified in the legal descriptions in paragraph (a)(1) of this section, constitute critical habitat for *Schiedea*

kauaiensis on Kauai. 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 in diverse mesic to wet *Acacia koa*-*Metrosideros polymorpha* forest and containing one or more of the following associated plant species: *Alphitonia ponderosa*, *Cryptocarya mannii*, *Diospyros* spp., *Dodonaea viscosa*, *Euphorbia haeleleana*, *Exocarpos luteolus*, *Leptocophylla tameiameiae*, *Microlepia strigosa*, *Nestegis sandwicensis*, *Peucedanum sandwicense*, *Pisonia* spp., *Psychotria* spp., or *Psydrax odorata*; and
- (ii) Elevations between 117 and 1,290 m (385 and 4,232 ft).

Family Caryophyllaceae: *Schiedea membranacea* (NCN)

Kauai 11—*Schiedea membranacea*—a, Kauai 11—*Schiedea membranacea*—b, Kauai 11—*Schiedea membranacea*—c, and Kauai 11—*Schiedea membranacea*—d, identified in the legal descriptions in paragraph (a)(1) of this section, constitute critical habitat for *Schiedea membranacea* on Kauai. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

- (i) Cliffs or cliff bases in mesic or wet habitats in lowland or montane shrubland or forest communities dominated by *Acacia koa*, *Pipturus* spp. and *Metrosideros polymorpha* or *Urticaceae* shrubland on talus slopes and containing one or more of the following associated native plant species: *Alphitonia ponderosa*, *Alyxia oliviformis*, *Asplenium* spp., *Athyrium sandwicensis*, *Bobea brevipes*, *Boehmeria grandis*, *Cyrtandra* spp., *Diplazium sandwichianum*, *Dodonaea viscosa*, *Eragrostis variabilis*, *Hedyotis terminalis*, *Hibiscus waimeae*, *Joinvillea ascendens* spp. *ascendens*, *Labordia helleri*, *Lepidium serra*, *Lysimachia kalalauensis*, *Machaerina angustifolia*, *Mariscus pennatifolius*, *Melicope* spp., *Myrsine* spp., *Perrottetia sandwicensis*, *Pisonia* spp., *Pleomele aurea*, *Poa mannii*, *Poa sandwicensis*, *Pouteria sandwicensis*, *Psychotria* spp., *Psydrax odorata*, *Remya kauaiensis*, *Sadleria cyatheoides*, *Scaevola procera*, *Thelypteris cyatheoides*, *Thelypteris sandwicensis*, or *Touchardia latifolia*; and
- (ii) Elevations between 423 and 1,259 m (1,386 and 4,131 ft).

Family Caryophyllaceae: *Schiedea nuttallii* (NCN)

Kauai 7—*Schiedea nuttallii*—a, identified in the legal description in

paragraph (a)(1) of this section, constitutes critical habitat for *Schiedea nuttallii* on Kauai. 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 in lowland diverse mesic forest dominated by *Metrosideros polymorpha* and containing one or more of the following associated native plant species: *Antidesma platyphyllum* var. *hillebrandii*, *Bidens valida*, *Chamaesyce celastroides*, *Eragrostis variabilis*, *Hedyotis acuminata*, *Hedyotis fluvialis*, *Heteropogon contortus*, *Lepidium* spp., *Lobelia niihauensis*, *Psychotria* spp., *Perrottetia sandwicensis*, or *Pisonia* spp.; and
- (ii) Elevations between 127 and 702 m (418 and 2,303 ft).

Family Caryophyllaceae: *Schiedea spergulina* var. *leiopoda* (NCN)

Kauai 9—*Schiedea spergulina* var. *leiopoda*—a, identified in the legal description in paragraph (a)(1) of this section, constitutes critical habitat for *Schiedea spergulina* var. *leiopoda* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

- (i) Bare rock outcrops or sparsely vegetated portions of rocky cliff faces or cliff bases in diverse lowland dry to mesic forests and containing one or more of the following native plant species: *Acacia koa*, *Artemisia australis*, *Bidens sandwicensis*, *Carex meyenii*, *Chamaesyce celastroides*, *Dianella sandwicensis*, *Doryopteris* spp., *Eragrostis variabilis*, *Erythrina sandwicensis*, *Gahnia* spp., *Heliotropium* spp., *Lepidium serra*, *Lipochaeta connata*, *Microlepia strigosa*, *Nestegis sandwicensis*, *Nototrichium sandwicense*, *Panicum lineale*, *Peucedanum sandwicense*, or *Wilkesia gymnoxiphium*; and
- (ii) Elevations between 21 and 90 m (69 and 294 ft).

Family Caryophyllaceae: *Schiedea spergulina* var. *spergulina* (NCN)

Kauai 11—*Schiedea spergulina* var. *spergulina*—a, Kauai 11—*Schiedea spergulina* var. *spergulina*—b, and Kauai 13—*Schiedea spergulina* var. *spergulina*—c, identified in the legal descriptions in paragraph (a)(1) of this section, constitute critical habitat for *Schiedea spergulina* var. *spergulina* on Kauai. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

- (i) Bare rock outcrops or sparsely vegetated portions of rocky cliff faces or cliff bases in diverse lowland dry to mesic forests and containing one or more of the following associated plant species: *Acacia koa*, *Artemisia australis*, *Bidens sandwicensis*, *Carex meyenii*, *Chamaesyce celastroides*, *Dianella sandwicensis*, *Doryopteris* spp., *Eragrostis variabilis*, *Erythrina sandwicensis*, *Gahnia* spp., *Heliotropium* spp., *Lepidium serra*, *Lipochaeta connata*, *Microlepia strigosa*, *Nestegis sandwicensis*, *Nototrichium sandwicense*, *Panicum lineale*, *Peucedanum sandwicense*, or *Wilkesia gymnoxiphium*; and
- (ii) Elevations between 145 and 829 m (474 and 2,718 ft).

Family Caryophyllaceae: *Schiedea stellarioides* (lauhilihi (=maolioli))

Kauai 11—*Schiedea stellarioides*—a, and Kauai 11—*Schiedea stellarioides*—b, identified in the legal descriptions in paragraph (a)(1) of this section, constitute critical habitat for *Schiedea stellarioides* on Kauai. 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 in closed *Acacia koa*-*Metrosideros polymorpha* lowland or montane mesic forest or shrubland and containing one or more of the following native plant species: *Alsinidendron viscosum*, *Artemisia australis*, *Bidens cosmoides*, *Chenopodium* spp., *Dianella sandwicensis*, *Dodonaea viscosa*, *Mariscus* spp., *Melicope* spp., *Nototrichium sandwicense*, *Pipturus* spp., *Leptecophylla tameiameiae*, *Syzygium sandwicensis*, or *Zanthoxylum dipetalum*; and
- (ii) Elevations between 376 and 1,251 m (1,135 and 4,102 ft).

Family Convolvulaceae: *Bonamia menziesii* (NCN)

Kauai 10—*Bonamia menziesii*—a, and Kauai 11—*Bonamia menziesii*—b, identified in the legal descriptions in paragraph (a)(1) of this section, constitute critical habitat for *Bonamia menziesii* on Kauai. 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, mesic, or wet *Metrosideros polymorpha*-*Cheirodendron-Dicranopteris* forest and containing one or more of the following native plant species: *Antidesma platyphyllum*, *Alphitonia ponderosa*, *Acacia koa*, *Cyanea* spp., *Cyrtandra pickeringii*, *Cyrtandra limahuliensis*, *Dianella sandwicensis*, *Diospyros sandwicensis*,

Dodonaea viscosa, *Dubautia knudsenii*, *Hedyotis terminalis*, *Isodendron longifolium*, *Labordia hirtella*, *Melicope anisata*, *Melicope barbigera*, *Myoporum sandwicense*, *Nestegis sandwicensis*, *Pisonia* spp., *Pittosporum* spp., *Pouteria sandwicensis*, *Psychotria mariniana*, *Psychotria hexandra*, *Psydrax odorata*, *Sapindus oahuensis*, *Scaevola procera*, or *Syzygium sandwicensis*; and

- (ii) Elevations between 566 and 1,127 m (1,858 and 3,695 ft).

Family Cyperaceae: *Cyperus trachysanthos* (puukaa)

Kauai 11—*Cyperus trachysanthos*—a, identified in the legal description in paragraph (a)(1) of this section, constitutes critical habitat for *Cyperus trachysanthos* on Kauai. 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 sites (mud flats, wet clay soil, or wet cliff seeps) on seepy flats or talus slopes and containing the native plant species *Talipariti tiliaceum*; and
- (ii) Elevations between 0 and 235 m (0 and 771 ft).

Family Cyperaceae: *Mariscus pennatiformis* (NCN)

Kauai 11—*Mariscus pennatiformis*—a, identified in the legal description in paragraph (a)(1) of this section, constitutes critical habitat for *Mariscus pennatiformis* on Kauai. 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 sites in *Metrosideros polymorpha*-*Acacia koa* mixed mesic forest and containing one or more of the following associated native plant species: *Alsinidendron viscosum*, *Antidesma platyphyllum* var. *hillebrandii*, *Carex alligata*, *Cyperus laevigatus*, *Dianella sandwicensis*, *Diospyros hillebrandii*, *Diospyros sandwicensis*, *Dodonaea viscosa*, *Leptecophylla tameiameiae*, *Myrsine linearifolia*, *Nestegis sandwicensis*, *Panicum nephelophilum*, *Poa sandwicensis*, *Psydrax odorata*, *Schiedea stellarioides*, or endemic ferns; and
- (ii) Elevations between 605 and 1,065 m (1,983 and 3,493 ft).

Family Euphorbiaceae: *Chamaesyce halemanui* (NCN)

Kauai 11—*Chamaesyce halemanui*—a, Kauai 11—*Chamaesyce halemanui*—b, and Kauai 11—*Chamaesyce halemanui*—c, identified in the legal descriptions in paragraph (a)(1) of this section, constitute critical habitat for

Chamaesyce halemanui on Kauai. 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 of gulches in mesic *Acacia koa* forests and containing one or more of the following native plant species: *Asplenium* spp., *Alphitonia ponderosa*, *Antidesma platyphyllum*, *Bobea brevipes*, *Carex meyenii*, *Carex wahuensis*, *Cheirodendron trigynum*, *Coprosma* spp., *Diospyros sandwicensis*, *Dodonaea viscosa*, *Elaeocarpus bifidus*, *Hedyotis terminalis*, *Kokia kauaiensis*, *Leptecophylla tameiameia*, *Microlepia strigosa*, *Melicope haupuensis*, *Metrosideros polymorpha*, *Panicum nephelophilum*, *Pisonia* spp., *Pittosporum* spp., *Pleomele aurea*, *Psychotria greenwelliae*, *Psychotria mariniana*, *Pouteria sandwicensis*, or *Santalum freycinetianum*; and
- (ii) Elevations between 556 and 1,249 m (1,825 and 4,097 ft).

Family Euphorbiaceae: *Euphorbia haelealeana* (akoko)

Kauai 11—*Euphorbia haelealeana*—a, Kauai 11—*Euphorbia haelealeana*—b, and Kauai 11—*Euphorbia haelealeana*—c, identified in the legal descriptions in paragraph (a)(1) of this section, constitute critical habitat for *Euphorbia haelealeana* on Kauai. 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 mixed mesic or dry *Diospyros* forest that is often codominated by *Metrosideros polymorpha* and *Alphitonia ponderosa* and containing one or more of the following native plant species: *Acacia koa*, *Antidesma platyphyllum*, *Carex meyenii*, *Carex wahuensis*, *Claoxylon sandwicense*, *Diplazium sandwichianum*, *Dodonaea viscosa*, *Erythrina sandwicensis*, *Kokia kauaiensis*, *Pisonia sandwicensis*, *Pleomele aurea*, *Pouteria sandwicensis*, *Psychotria greenwelliae*, *Psychotria mariniana*, *Pteralyxia kauaiensis*, *Rauvolfia sandwicensis*, *Sapindus oahuensis*, *Tetraplasandra kawaiensis*, or *Xylosma* spp.; and
- (ii) Elevations between 284 and 1,179 m (931 and 3,866 ft).

Family Euphorbiaceae: *Flueggea neowawraea* (mehamehame)

Kauai 11—*Flueggea neowawraea*—a, Kauai 11—*Flueggea neowawraea*—b, Kauai 11—*Flueggea neowawraea*—c, Kauai 11—*Flueggea neowawraea*—d, Kauai 11—*Flueggea neowawraea*—e, and Kauai 11—*Flueggea neowawraea*—f, identified in the legal descriptions in

paragraph (a)(1) of this section, constitute critical habitat for *Flueggea neowawraea* on Kauai. 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 forests containing one or more of the following native plant species: *Alectryon macrococcus*, *Antidesma platyphyllum*, *Bidens sandwicensis*, *Bobea timonioides*, *Caesalpinia kawaiensis*, *Charpentiera* spp., *Diospyros* spp., *Diplazium sandwichianum*, *Freycinetia arborea*, *Hibiscus* spp., *Isodendron laurifolium*, *Kokia kauaiensis*, *Melicope* spp., *Metrosideros polymorpha*, *Munroidendron racemosum*, *Myrsine lanaiensis*, *Nesoluma polynesicum*, *Nestegis sandwicensis*, *Pittosporum* spp., *Pouteria sandwicensis*, *Pritchardia minor*, *Psychotria* spp., *Psydrax odorata*, *Pteralyxia kauaiensis*, *Rauvolfia sandwicensis*, *Streblus pendulinus*, *Tetraplasandra* spp., *Xylosma crenatum*, or *Xylosma hawaiiense*; and
- (ii) Elevations between 210 and 1,178 m (689 and 3,865 ft).

Family Fabaceae: *Sesbania tomentosa* (ohai)

Kauai 8—*Sesbania tomentosa*—a, and Kauai 14—*Sesbania tomentosa*—b, identified in the legal descriptions in paragraph (a)(1) of this section, constitute critical habitat for *Sesbania tomentosa* on Kauai. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

- (i) Sandy beaches, dunes, or pond margins in coastal dry shrublands or mixed coastal dry cliffs, and containing one or more of the following associated native plant species: *Chamaesyce celastroides*, *Cuscuta sandwighiana*, *Dodonaea viscosa*, *Heteropogon contortus*, *Myoporum sandwicense*, *Nama sandwicensis*, *Scaevola sericea*, *Sida fallax*, *Sporobolus virginicus*, *Vitex rotundifolia*, or *Waltheria indica*; and
- (ii) Elevations between 0 and 130 m (0 and 427 ft).

Family Flacourtiaceae: *Xylosma crenatum* (NCN)

Kauai 11—*Xylosma crenatum*—a, and Kauai 12—*Xylosma crenatum*—b, identified in the legal descriptions in paragraph (a)(1) of this section, constitute critical habitat for *Xylosma crenatum* on Kauai. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

- (i) Diverse *Acacia koa*-*Metrosideros polymorpha* montane mesic or wet forest, or *Metrosideros polymorpha*-*Dicranopteris linearis* montane wet forest, and containing one or more of the following associated native plant species: *Athyrium sandwicensis*, *Cheirodendron* spp., *Claoxylon sandwicense*, *Coprosma* spp., *Cyanea* spp., *Diplazium sandwichianum*, *Dubautia knudsenii*, *Hedyotis* spp., *Ilex anomala*, *Lobelia yuccoides*, *Myrsine* spp., *Nestegis sandwicensis*, *Perrottetia sandwicensis*, *Pleomele aurea*, *Poa sandwicensis*, *Pouteria sandwicensis*, *Psychotria* spp., *Scaevola procera*, *Streblus pendulinus*, *Tetraplasandra* spp., *Touchardia latifolia*, or *Zanthoxylum dipetalum*; and
- (ii) Elevations between 941 and 1,284 m (3,086 and 4,212 ft).

Family Gentianaceae: *Centaurium sebaeoides* (awiwi)

Kauai 11—*Centaurium sebaeoides*—a, identified in the legal description in paragraph (a)(1) of this section, constitutes critical habitat for *Centaurium sebaeoides* on Kauai. Within this unit, 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 on cliffs in arid coastal areas and containing one or more of the following native plant species: *Artemisia* spp., *Bidens* spp., *Chamaesyce celastroides*, *Cyperus phleoides*, *Dodonaea viscosa*, *Fimbristylis cymosa*, *Heteropogon contortus*, *Jacquemontia ovalifolia*, *Lipochaeta* spp., *Lycium sandwicense*, *Lysimachia mauritiana*, *Melanthera integrifolia*, *Panicum fauriei*, *Panicum torridum*, *Scaevola sericea*, *Sida fallax*, or *Wikstroemia uva-ursi*; and
- (ii) Elevations between 0 and 147 m (0 and 483 ft).

Family Gesneriaceae: *Cyrtandra cyaneoides* (mapele)

Kauai 4—*Cyrtandra cyaneoides*—a, Kauai 11—*Cyrtandra cyaneoides*—b, and Kauai 11—*Cyrtandra cyaneoides*—c, identified in the legal descriptions in paragraph (a)(1) of this section, constitute critical habitat for *Cyrtandra cyaneoides* on Kauai. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

- (i) Talus rubble on steep slopes or cliffs with water seeps running below, near streams or waterfalls in lowland or montane wet forest or shrubland dominated by *Metrosideros polymorpha* or a mixture of *Metrosideros polymorpha*, *Cheirodendron* spp., and

Dicranopteris linearis and containing one or more of the following native species: *Bidens* spp., *Boehmeria grandis*, *Coprosma* spp., *Cyanea* spp., *Cyrtandra kauaiensis*, *Cyrtandra limahuliensis*, *Cyrtandra longifolia*, *Diplazium sandwichianum*, *Freycinetia arborea*, *Gunnera kauaiensis*, *Hedyotis terminalis*, *Hedyotis tryblum*, *Machaerina* spp., *Melicope clusiifolia*, *Melicope puberula*, *Perrottetia sandwicensis*, *Pipturus* spp., *Psychotria* spp., *Pritchardia* spp., or *Stenogyne purpurea*; and

(ii) Elevations between 157 and 1,407 m (514 and 4,614 ft).

Family Gesneriaceae: *Cyrtandra limahuliensis* (haiwale)

Kauai 4—*Cyrtandra limahuliensis*—a, Kauai 4—*Cyrtandra limahuliensis*—b, Kauai 10—*Cyrtandra limahuliensis*—c, Kauai 11—*Cyrtandra limahuliensis*—d, and Kauai 11—*Cyrtandra limahuliensis*—e, identified in the legal descriptions in paragraph (a)(1) of this section, constitute critical habitat for *Cyrtandra limahuliensis* on Kauai. 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 in lowland wet forests containing one or more of the following native plant species: *Antidesma platyphyllum*, *Bidens* spp., *Boehmeria grandis*, *Charpentiera* spp., *Cibotium glaucum*, *Cyanea* spp., *Cyrtandra kealiae*, *Dicranopteris linearis*, *Diplazium sandwichianum*, *Dubautia* spp., *Eugenia reinwardtiana*, *Gunnera kauaiensis*, *Hedyotis terminalis*, *Hibiscus waimeae*, *Metrosideros polymorpha*, *Perrottetia sandwicensis*, *Pisonia* spp., *Pipturus* spp., *Pritchardia* spp., *Psychotria* spp., or *Touchardia latifolia*; and

(ii) Elevations between 208 and 1,591 m (681 and 5,217 ft).

Family Lamiaceae: *Phyllostegia knudsenii* (NCN)

Kauai 11—*Phyllostegia knudsenii*—a, identified in the legal description in paragraph (a)(1) of this section, constitutes critical habitat for *Phyllostegia knudsenii* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) *Metrosideros polymorpha* lowland mesic or wet forest containing one or more of the following associated native plant species: *Bobea timonioides*, *Claoxylon sandwicense*, *Cryptocarya mannii*, *Cyrtandra kauaiensis*, *Cyrtandra paludosa*, *Diospyros sandwicensis*, *Elaeocarpus bifidus*, *Ilex*

anomala, *Myrsine linearifolia*, *Perrottetia sandwicensis*, *Pittosporum kauaiense*, *Pouteria sandwicensis*, *Pritchardia minor*, *Selaginella arbuscula*, *Tetraplasandra oahuensis*, or *Zanthoxylum dipetalum*; and

(ii) Elevations between 401 and 1,059 m (1,315 and 3,475 ft).

Family Lamiaceae: *Phyllostegia waimeae* (no common name)

Kauai 11—*Phyllostegia waimeae*—a, and Kauai 11—*Phyllostegia waimeae*—b, identified in the legal descriptions in paragraph (a)(1) of this section, constitute critical habitat for *Phyllostegia waimeae* on Kauai. 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*-*Metrosideros polymorpha* dominated wet or mixed mesic forest with *Cheirodendron* spp. or *Dicranopteris linearis* as co-dominants and containing one or more of the following associated native plant species: *Broussaisia arguta*, *Claoxylon sandwicense*, *Diplazium sandwichianum*, *Dubautia knudsenii*, *Elaphoglossum* spp., *Gunnera kauaiensis*, *Hedyotis* spp., *Myrsine lanaiensis*, *Pleomele aurea*, *Psychotria* spp., *Sadleria* spp., *Scaevola procera*, *Syzygium sandwicensis*, or *Vaccinium* spp.; and

(ii) Elevations between 655 and 1,224 m (2,149 and 4,016 ft).

Family Lamiaceae: *Phyllostegia wawrana* (no common name)

Kauai 4—*Phyllostegia wawrana*—a, Kauai 11—*Phyllostegia wawrana*—b, Kauai 11—*Phyllostegia wawrana*—c, and Kauai 11—*Phyllostegia wawrana*—d, identified in the legal descriptions in paragraph (a)(1) of this section, constitute critical habitat for *Phyllostegia wawrana* on Kauai. 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*-*Metrosideros polymorpha*-*Cheirodendron* mixed mesic forest containing one or more of the following associated native plant species: *Alectryon macrococcus*, *Asplenium polyodon*, *Athyrium microphyllum*, *Carex* spp., *Claoxylon sandwicense*, *Cyanea fissa*, *Delissea rivularis*, *Dianella sandwicensis*, *Diplazium sandwichianum*, *Dodonaea viscosa*, *Doodia kunthiana*, *Dryopteris wallichiana*, *Dubautia knudsenii*, *Dubautia laevigata*, *Hedyotis tryblum*, *Machaerina angustifolia*, *Panicum nephelophilum*, *Peperomia* spp., *Perrottetia sandwicensis*, *Poa*

sandwicensis, *Pleomele aurea*, *Pteridium aquilinum* var. *decompositum*, *Sadleria pallida*, *Scaevola procera*, *Schiedea stellarioides*, *Syzygium sandwicensis*, *Touchardia latifolia*, or *Vaccinium dentatum*; and

(ii) Elevations between 400 and 1,284 m (1,311 and 4,212 ft).

Family Lamiaceae: *Stenogyne campanulata* (NCN)

Kauai 11—*Stenogyne campanulata*—a, identified in the legal description in paragraph (a)(1) of this section, constitutes critical habitat for *Stenogyne campanulata* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Rock faces of nearly vertical, north-facing cliffs in diverse lowland or montane mesic forest and containing one or more of the following associated native plant species: *Lepidium serra*, *Lobelia niihauensis*, *Lysimachia* spp., *Melicope pallida*, *Metrosideros polymorpha*, *Neraudia kauaiensis*, *Nototrichium divaricatum*, *Poa mannii*, *Remya montgomeryi*, or *Wilkesia gymnoxiphium*; and

(ii) Elevations between 335 and 1,290 (1,100 and 4,232 ft).

Family Loganiaceae: *Labordia lydgatei* (kamakahala)

Kauai 4—*Labordia lydgatei*—a, Kauai 10—*Labordia lydgatei*—b, Kauai 11—*Labordia lydgatei*—c, Kauai 11—*Labordia lydgatei*—d, and Kauai 11—*Labordia lydgatei*—e, identified in the legal descriptions in paragraph (a)(1) of this section, constitute critical habitat for *Labordia lydgatei* on Kauai. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

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

(ii) Elevations between 182 and 1,148 m (597 and 3,737 ft).

Family Loganiaceae: *Labordia tinifolia* var. *wahiawaensis* (kamakahala)

Kauai 10—*Labordia tinifolia* var. *wahiawaensis*—a, identified in the legal description in paragraph (a)(1) of this section, constitutes critical habitat for *Labordia tinifolia* var. *wahiawaensis* on

Kauai. Within this unit, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

- (i) Streambanks in lowland wet forests dominated by *Metrosideros polymorpha* and containing one or more of the following associated species: *Antidesma platyphyllum*, *Athyrium microphyllum*, *Cheirodendron* spp., *Cyrtandra* spp., *Dicranopteris linearis*, *Hedyotis terminalis*, or *Psychotria* spp.; and
- (ii) Elevations between 458 and 1,006 m (1,502 and 3,301 ft).

Family Malvaceae: *Hibiscadelphus woodii* (hau kuahiwi)

Kauai 11—*Hibiscadelphus woodii*—a, and Kauai 11—*Hibiscadelphus woodii*—b, identified in the legal descriptions in paragraph (a)(1) of this section, constitute critical habitat for *Hibiscadelphus woodii* on Kauai. 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 talus or cliff walls in *Metrosideros polymorpha* montane mesic forest and containing one or more of the following associated native plant species: *Artemisia australis*, *Bidens sandwicensis*, *Carex meyenii*, *Chamaesyce celastroides* var. *hanapeensis*, *Dubautia* spp., *Hedyotis* spp., *Lepidium serra*, *Lipochaeta* spp., *Lobelia niihauensis*, *Lysimachia glutinosa*, *Melicope pallida*, *Myrsine* spp., *Nototrichium* spp., *Panicum lineale*, *Poa mannii*, or *Stenogyne campanulata*; and
- (ii) Elevations between 219 and 1,197 m (717 and 3,926 ft).

Family Malvaceae: *Hibiscus clayi* (Clay's hibiscus)

Kauai 4—*Hibiscus clayi*—a, Kauai 4—*Hibiscus clayi*—b, Kauai 4—*Hibiscus clayi*—c, Kauai 4—*Hibiscus clayi*—d, Kauai 4—*Hibiscus clayi*—e, and Kauai 5—*Hibiscus clayi*—f, identified in the legal descriptions in paragraph (a)(1) of this section, constitute critical habitat for *Hibiscus clayi* on Kauai. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

- (i) Slopes in *Acacia koa* or *Diospyros* spp.-*Pisonia* spp.-*Metrosideros polymorpha* lowland dry or mesic forest and containing one or more of the following associated native plant species: *Artemisia australis*, *Bidens* spp., *Cyanea hardyi*, *Gahnia* spp., *Hedyotis acuminata*, *Munroidendron racemosum*, *Pandanus tectorius*, *Panicum tenuifolium*, *Pleomele aurea*,

Pipturus spp., *Psychotria* spp., or *Psydrax odorata*; and

- (ii) Elevations between 121 and 765 m (396 and 2,509 ft).

Family Malvaceae: *Hibiscus waimeae* ssp. *hannerae* (kokio keokeo)

Kauai 11—*Hibiscus waimeae* ssp. *hannerae*—a, identified in the legal description in paragraph (a)(1) of this section, constitutes critical habitat for *Hibiscus waimeae* ssp. *hannerae* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

- (i) *Metrosideros polymorpha*-*Dicranopteris linearis* or *Pisonia* spp.-*Charpentiera elliptica* lowland wet or mesic forest and containing one or more of the following associated native plant species: *Antidesma* spp., *Bidens* spp., *Bobea* spp., *Cibotium* spp., *Cyanea* spp., *Cyrtandra* spp., *Perrottetia sandwicensis*, *Pipturus* spp., *Psychotria* spp., *Sadleria* spp., or *Syzygium sandwicensis*; and
- (ii) Elevations between 174 and 1,155 m (570 and 3,787 ft).

Family Malvaceae: *Kokia kauaiensis* (kokio)

Kauai 11—*Kokia kauaiensis*—a, Kauai 11—*Kokia kauaiensis*—b, Kauai 11—*Kokia kauaiensis*—c, and Kauai 11—*Kokia kauaiensis*—d, identified in the legal descriptions in paragraph (a)(1) of this section, constitute critical habitat for *Kokia kauaiensis* on Kauai. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

- (i) Diverse mesic forest containing one or more of the following associated native plant species: *Acacia koa*, *Alyxia oliviformis*, *Antidesma* spp., *Bobea* spp., *Chamaesyce celastroides*, *Claoxylon sandwicense*, *Dicranopteris linearis*, *Diellia pallida*, *Diospyros hillebrandii*, *Diospyros sandwicensis*, *Dodonaea viscosa*, *Flueggea neowawraea*, *Hedyotis* spp., *Hibiscus* spp., *Isodendron laurifolium*, *Lipochaeta fauriei*, *Melicope* spp., *Metrosideros polymorpha*, *Nestegis sandwicensis*, *Nototrichium* spp., *Pisonia* spp., *Pleomele aurea*, *Pouteria sandwicensis*, *Psydrax odorata*, *Pteralyxia kauaiensis*, *Rauvolfia sandwicensis*, *Santalum freycinetianum* var. *pyrularium*, *Streblus pendulinus*, *Syzygium sandwicensis*, *Tetraplasandra* spp., or *Xylosma* spp.; and

- (ii) Elevations between 300 and 1,049 m (984 and 3,441 ft).

Family Myrsinaceae: *Myrsine linearifolia* (kolea)

Kauai 7—*Myrsine linearifolia*—a, Kauai 10—*Myrsine linearifolia*—b, Kauai 11—*Myrsine linearifolia*—c, Kauai 11—*Myrsine linearifolia*—d, Kauai 11—*Myrsine linearifolia*—e, and Kauai 11—*Myrsine linearifolia*—f, identified in the legal descriptions in paragraph (a)(1) of this section, constitute critical habitat for *Myrsine linearifolia* on Kauai. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

- (i) Diverse mesic or wet lowland or montane *Metrosideros polymorpha* forest with *Cheirodendron* spp. or *Dicranopteris linearis* as co-dominant species, and containing one or more of the following associated native plant species: *Bobea brevipes*, *Cryptocarya mannii*, *Dubautia* spp., *Eurya sandwicensis*, *Freycinetia arborea*, *Hedyotis terminalis*, *Lysimachia glutinosa*, *Machaerina angustifolia*, *Melicope* spp., *Myrsine* spp., *Nothocestrum* spp., *Psychotria* spp., *Sadleria pallida*, or *Syzygium sandwicensis*; and
- (ii) Elevations between 129 and 1,345 m (424 and 4,411 ft).

Family Orchidaceae: *Platanthera holochila* (NCN)

Kauai 11—*Platanthera holochila*—a, identified in the legal description in paragraph (a)(1) of this section, constitutes critical habitat for *Platanthera holochila* on Kauai. 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 *Metrosideros polymorpha*—*Dicranopteris linearis* wet forest or *M. polymorpha* mixed bog and containing one or more of the following associated native plant species: *Carex montis-eeka*, *Cibotium* spp., *Clermontia fauriei*, *Coprosma elliptica*, *Dichanthelium* spp., grammitid ferns (Grammitidaceae), *Leptocophylla tameiameiae*, *Lobelia kauaensis*, *Machaerina angustifolia*, *Myrsine denticulata*, *Oreobolus furcatus*, *Rhynchospora* spp., *Vaccinium* spp., or *Viola kauaensis*; and
- (ii) Elevations between 861 and 1,453 m (2,825 and 4,766 ft).

Family Plantaginaceae: *Plantago princeps* (laukahi kuahiwi)

Kauai 10—*Plantago princeps*—a, Kauai 11—*Plantago princeps*—b, Kauai 11—*Plantago princeps*—c, and Kauai 11—*Plantago princeps*—d, identified in

the legal descriptions in paragraph (a)(1) of this section, constitute critical habitat for *Plantago princeps* on Kauai. 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 areas near waterfalls in *Metrosideros polymorpha*-*Cheirodendron* montane wet forest with riparian vegetation or *Metrosideros polymorpha* lowland to montane transitional wet forest on cliffs and ridges, growing on basalt rocky outcrops, and containing one or more of the following associated native plant species: *Antidesma platyphyllum* var. *hillebrandii*, *Bidens forbesii*, *Bidens sandwicensis*, *Bobea elatior*, *Boehmeria grandis*, *Carex meyenii*, *Carex wahuensis*, *Charpentiera elliptica*, *Cyrtandra* spp., *Diplazium sandwichianum*, *Freycinetia arborea*, *Gunnera kauaiensis*, *Hedyotis* spp., *Huperzia* spp., *Isachne pallens*, *Lipochaeta connata*, *Lysimachia glutinosa*, *Lysimachia kalalauensis*, *Metacharina angustifolia*, *Melicope* spp., *Myrsine linearifolia*, *Perrottetia sandwicensis*, *Pilea peploides*, *Pipturus* spp., *Poa mannii*, *Sadleria cyatheoides*, *Tetraplasandra* spp., or *Wilkesia gymnoxiphium*; and

(ii) Elevations between 434 and 1,563 m (1,424 and 5,128 ft).

Family Poaceae: *Ischaemum byrone* (Hilo ischaemum)

Kauai 1—*Ischaemum byrone*—a, Kauai 2—*Ischaemum byrone*—b, Kauai 3—*Ischaemum byrone*—c, and Kauai 11—*Ischaemum byrone*—d, identified in the legal descriptions in paragraph (a)(1) of this section, constitute critical habitat for *Ischaemum byrone* on Kauai. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Coastal shrubland near the ocean among rocks and seepy cliffs and containing one or more of the following associated native plant species: *Bidens* spp., *Chamaesyce celastroides*, *Fimbristylis cymosa*, *Lipochaeta succulenta*, *Lysimachia mauritiana*, or *Scaevola sericea*; and

(ii) Elevations between 0 and 159 m (0 and 523 ft).

Family Poaceae: *Panicum niihauense* (lau ehū)

Kauai 14—*Panicum niihauense*—a, Kauai 15—*Panicum niihauense*—b, Kauai 16—*Panicum niihauense*—c, and Kauai 17—*Panicum niihauense*—d, identified in the legal descriptions in paragraph (a)(1) of this section, constitute critical habitat for *Panicum*

niihauense on Kauai. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Sand dunes in coastal shrubland and containing one or more of the following associated native plant species: *Cassytha filiformis*, *Chamaesyce celastroides*, *Dodonaea viscosa*, *Nama sandwicensis*, *Ophioglossum pendulum* ssp. *falcatum*, *Scaevola sericea*, *Sida fallax*, *Sporobolus virginicus*, or *Vitex rotundifolia*; and

(ii) Elevations between 0 and 29 m (0 and 95 ft).

Family Poaceae: *Poa mannii* (Mann's bluegrass)

Kauai 11—*Poa mannii*—a, Kauai 11—*Poa mannii*—b, Kauai 11—*Poa mannii*—c, and Kauai 11—*Poa mannii*—d, identified in the legal descriptions in paragraph (a)(1) of this section, constitute critical habitat for *Poa mannii* on Kauai. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Cliffs or rock faces in lowland or montane mesic *Metrosideros polymorpha* or *Acacia koa*-*Metrosideros polymorpha* forest and containing one or more of the following associated native plant species: *Antidesma platyphyllum*, *Artemisia australis*, *Bidens cosmoides*, *Bidens sandwicensis*, *Carex meyenii*, *Carex wahuensis*, *Chamaesyce celastroides* var. *hanapeensis*, *Cyperus phleoides*, *Diospyros sandwicensis*, *Dodonaea viscosa*, *Eragrostis variabilis*, *Hedyotis terminalis*, *Lobelia niihauensis*, *Lobelia yuccoides*, *Luzula hawaiiensis*, *Melicope anisata*, *Melicope barbiger*, *Melicope pallida*, *Nototrichum* spp., *Panicum lineale*, *Pleomele aurea*, *Pouteria sandwicensis*, *Psychotria greenwelliae*, *Psychotria mariniana*, *Schiedea* spp., or *Wilkesia gymnoxiphium*; and

(ii) Elevations between 327 and 1,222 m (1,072 and 4,009 ft).

Family Poaceae: *Poa sandwicensis* (Hawaiian bluegrass)

Kauai 11—*Poa sandwicensis*—a, and Kauai 11—*Poa sandwicensis*—b, identified in the legal descriptions in paragraph (a)(1) of this section, constitute critical habitat for *Poa sandwicensis* on Kauai. 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, shaded, gentle to steep slopes, ridges, and rock ledges of stream banks in semi-open to closed, wet, diverse *Acacia koa*-*Metrosideros polymorpha* montane forest and containing one or more of the following associated native species: *Alyxia oliviformis*, *Bidens sandwicensis*, *Cheirodendron* spp., *Claoxylon sandwicense*, *Coprosma* spp., *Dianella sandwicensis*, *Dicranopteris linearis*, *Dodonaea viscosa*, *Dubautia* spp., *Hedyotis* spp., *Melicope* spp., *Peperomia* spp., *Psychotria* spp., *Scaevola procera*, *Schiedea stellarioides*, or *Syzygium sandwicensis*; and

(ii) Elevations between 473 and 1,270 m (1,553 and 4,165 ft).

Family Poaceae: *Poa siphonoglossa* (NCN)

Kauai 11—*Poa siphonoglossa*—a, and Kauai 11—*Poa siphonoglossa*—b, identified in the legal descriptions in paragraph (a)(1) of this section, constitute critical habitat for *Poa siphonoglossa* on Kauai. 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 banks on steep slopes in mesic *Metrosideros polymorpha*-*Acacia koa* forests and containing one or more of the following associated native plant species: *Alphitonia ponderosa*, *Alyxia oliviformis*, *Bobea brevipes*, *Carex meyenii*, *Carex wahuensis*, *Coprosma waimeae*, *Dianella sandwicensis*, *Dodonaea viscosa*, *Dubautia* spp., *Hedyotis* spp., *Leptecophylla tameiameia*, *Lobelia yuccoides*, *Melicope* spp., *Microlepia strigosa*, *Myrsine* spp., *Panicum nephelophilum*, *Poa sandwicensis*, *Psychotria* spp., *Scaevola procera*, *Tetraplasandra kawaiensis*, *Vaccinium* spp., *Wilkesia gymnoxiphium*, *Xylosma* spp., or *Zanthoxylum dipetalum*; and

(ii) Elevations between 480 and 1,296 m (1,573 and 4,251 ft).

Family Primulaceae: *Lysimachia filifolia* (no common name)

Kauai 10—*Lysimachia filifolia*—a, identified in the legal description in paragraph (a)(1) of this section, constitutes critical habitat for *Lysimachia filifolia* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Mossy banks at the base of cliff faces within the spray zone of waterfalls or along streams in lowland wet forests and containing one or more of the following associated native plant species: *Antidesma platyphyllum*,

Bidens valida, *Bobea elatior*, *Chamaesyce remyi* var. *kauaiensis*, *Cyanea asarifolia*, *Dubautia plantaginea* ssp. *magnifolia*, *Eragrostis variabilis*, *Machaerina angustifolia*, *Melicope* spp., *Metrosideros polymorpha*, or *Panicum lineale*; and

(ii) Elevations between 454 and 1,308 m (1,490 and 4,290 ft).

Family Rhamnaceae: *Gouania meyenii* (NCN)

Kauai 11—*Gouania meyenii*—a, Kauai 11—*Gouania meyenii*—b, and Kauai 11—*Gouania meyenii*—c, identified in the legal descriptions in paragraph (a)(1) of this section, constitute critical habitat for *Gouania meyenii* on Kauai. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Rocky ledges, cliff faces, and ridge tops in dry shrubland or *Metrosideros polymorpha* lowland diverse mesic forest and containing one or more of the following native plant species: *Bidens* spp., *Carex meyenii*, *Chamaesyce* spp., *Dodonaea viscosa*, *Diospyros* spp., *Eragrostis variabilis*, *Euphorbia haelealeana*, *Hedyotis* spp., *Hibiscadelphus* spp., *Lysimachia* spp., *Melicope pallida*, *Neraudia kauaiensis*, *Nestegis sandwicensis*, *Nototrichium divaricatum*, *Panicum lineale*, *Poa mannii*, *Psychotria* spp., *Senna gaudichaudii*, or *Wilkesia gymnoxiphium*; and

(ii) Elevations between 375 and 1,179 m (1,231 and 3,867 ft).

Family Rubiaceae: *Hedyotis cookiana* (awiiwi)

Kauai 11—*Hedyotis cookiana*—a, identified in the legal description in paragraph (a)(1) of this section, constitutes critical habitat for *Hedyotis cookiana* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Streambeds or steep cliffs close to water sources in relict *Metrosideros polymorpha* lowland mesic and lowland wet forest communities containing one or more of the following associated native plant species: *Boehmeria grandis*, *Chamaesyce celastroides* var. *hanapepensis*, *Hibiscus kokio* ssp. *saintjohnianus*, *Machaerina angustifolia*, *Nototrichium sandwicense*, *Pipturus kauaiensis*, *Pleomele aurea*, *Pouteria sandwicensis*, *Psydrax odorata*, or *Rauvolfia sandwicensis*; and

(ii) Elevations between 120 and 553 m (392 and 1,814 ft).

Family Rubiaceae: *Hedyotis st. johnii* (Na Pali beach hedyotis)

Kauai 11—*Hedyotis st. johnii*—a, identified in the legal description in paragraph (a)(1) of this section, constitutes critical habitat for *Hedyotis st. johnii* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Crevices of north-facing, near-vertical coastal cliff faces within the spray zone in sparse dry coastal shrubland and containing one or more of the following native plant species: *Artemisia australis*, *Bidens* spp., *Capparis sandwichiana*, *Chamaesyce celastroides*, *Eragrostis variabilis*, *Heteropogon contortus*, *Lipochaeta connata*, *Lycium sandwicense*, *Myoporum sandwicense*, *Nototrichium sandwicense*, or *Schiedea apokremnos*; and

(ii) Elevations between 0 and 187 m (0 and 613 ft).

Family Rutaceae: *Melicope haupuensis* (alani)

Kauai 7—*Melicope haupuensis*—a, Kauai 11—*Melicope haupuensis*—b, and Kauai 11—*Melicope haupuensis*—c, identified in the legal descriptions in paragraph (a)(1) of this section, constitute critical habitat for *Melicope haupuensis* on Kauai. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Moist talus slopes in *Metrosideros polymorpha*-dominated lowland mesic forests or *Metrosideros polymorpha*-*Acacia koa* montane mesic forest and containing one or more of the following associated native plant species: *Antidesma platyphyllum* var. *hillebrandii*, *Bobea brevipes*, *Cheirodendron trigynum*, *Claoxylon sandwicense*, *Cryptocarya mannii*, *Dianella sandwicensis*, *Diospyros hillebrandii*, *Diospyros sandwicensis*, *Dodonaea viscosa*, *Elaeocarpus bifidus*, *Hedyotis terminalis*, *Melicope anisata*, *Melicope barbigera*, *Melicope ovata*, *Pleomele aurea*, *Pouteria sandwicensis*, *Pritchardia minor*, *Psychotria greenwelliae*, *Psychotria mariniana*, *Tetraplasandra waimeae*, or *Zanthoxylum dipetalum*; and

(ii) Elevations between 125 and 1,249 m (410 and 4,097 ft).

Family Rutaceae: *Melicope knudsenii* (alani)

Kauai 11—*Melicope knudsenii*—a, and Kauai 11—*Melicope knudsenii*—b, identified in the legal descriptions in

paragraph (a)(1) of this section, constitute critical habitat for *Melicope knudsenii* on Kauai. 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 with brown granular soil in lowland dry to montane mesic forests and containing one or more of the following associated native plant species: *Alectryon macrococcus*, *Antidesma platyphylla*, *Bobea brevipes*, *Carex meyenii*, *Cryptocarya mannii*, *Diospyros sandwicensis*, *Diplazium sandwichianum*, *Dodonaea viscosa*, *Euphorbia haelealeana*, *Gahnia becheyi*, *Hedyotis* spp., *Hibiscus waimeae*, *Isodendron laurifolium*, *Leptecophylla tameiameia*, *Melicope* spp., *Metrosideros polymorpha*, *Myrsine lanaiensis*, *Nestegis sandwicensis*, *Panicum nephelophilum*, *Peucedanum sandwicense*, *Pisonia sandwicensis*, *Pittosporum kauaiensis*, *Pleomele aurea*, *Pouteria sandwicensis*, *Pritchardia minor*, *Psychotria hobdyi*, *Psydrax odorata*, *Rauvolfia sandwicensis*, *Remya kauaiensis*, *Scaevola procera*, or *Xylosma hawaiiense*; and

(ii) Elevations between 346 and 1,065 m (1,135 and 3,492 ft).

Family Rutaceae: *Melicope pallida* (alani)

Kauai 11—*Melicope pallida*—a, and Kauai 11—*Melicope pallida*—b, identified in the legal descriptions in paragraph (a)(1) of this section, constitute critical habitat for *Melicope pallida* on Kauai. 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 rock faces in lowland to montane mesic to wet forests or shrubland and containing one or more of the following associated native plant species: *Alyxia oliviformis*, *Artemisia australis*, *Boehmeria grandis*, *Carex meyenii*, *Chamaesyce celastroides* var. *hanapepensis*, *Coprosma kauensis*, *Coprosma waimeae*, *Dodonaea viscosa*, *Dryopteris* spp., *Hedyotis terminalis*, *Lepidium serra*, *Melicope* spp., *Metrosideros polymorpha*, *Nototrichium* spp., *Pipturus albidus*, *Pleomele aurea*, *Poa mannii*, *Psychotria mariniana*, *Pritchardia minor*, *Sapindus oahuensis*, *Schiedea membranacea*, *Tetraplasandra waialealae*, or *Xylosma hawaiiense*; and

(ii) Elevations between 418 and 1,081 m (1,371 and 3,546 ft).

Family Rutaceae: *Zanthoxylum hawaiiense* (ae)

Kauai 11—*Zanthoxylum hawaiiense*—a, identified in the legal description in paragraph (a)(1) of this section, constitutes critical habitat for *Zanthoxylum hawaiiense* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Lowland dry or mesic forests dominated by *Metrosideros polymorpha* or *Diospyros sandwicensis*, and containing one or more of the following associated plant species: *Alectryon macrococcus*, *Antidesma platyphyllum*, *Charpentiera elliptica*, *Dodonaea viscosa*, *Melicope* spp., *Myrsine lanaiensis*, *Pisonia* spp., *Pleomele aurea*, *Streblus pendulinus*, or *Zanthoxylum dipetalum*; and

(ii) Elevations between 332 and 1,151 m (1,089 and 3,774 ft).

Family Santalaceae: *Exocarpos luteolus* (heau)

Kauai 10—*Exocarpos luteolus*—a, Kauai 11—*Exocarpos luteolus*—b, Kauai 11—*Exocarpos luteolus*—c, Kauai 11—*Exocarpos luteolus*—d, and Kauai 11—*Exocarpos luteolus*—e, identified in the legal descriptions in paragraph (a)(1) of this section, constitute critical habitat for *Exocarpos luteolus* on Kauai. 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 places bordering swamps or open bogs or on open or dry ridges in lowland or montane mesic *Acacia koa*-*Metrosideros polymorpha*-dominated forest communities with *Dicranopteris linearis* and containing one or more of the following native plant species: *Bobea brevipes*, *Cheirodendron trigynum*, *Claoxylon sandwicense*, *Dianella sandwicensis*, *Dodonaea viscosa*, *Dubautia laevigata*, *Elaeocarpus bifidus*, *Hedyotis terminalis*, *Leptecophylla tameiameia*, *Melicope haupuensis*, *Peperomia* spp., *Pleomele aurea*, *Poa sandwicensis*, *Pouteria sandwicensis*, *Psychotria greenwelliae*, *Psychotria mariniana*, *Santalum freycinetianum*, or *Schiedea stellarioides*; and

(ii) Elevations between 416 and 1,453 m (1,364 and 4,766 ft).

Family Sapindaceae: *Alectryon macrococcus* (mahoe)

Kauai 11—*Alectryon macrococcus*—a, and Kauai 11—*Alectryon macrococcus*—b, identified in the legal descriptions in paragraph (a)(1) of this section, constitute critical habitat for

Alectryon macrococcus on Kauai. 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 slopes or gulches in *Diospyros* spp.-*Metrosideros polymorpha* lowland mesic forest, *Metrosideros polymorpha* mixed mesic forest, or *Diospyros* spp. mixed mesic forest, and containing one or more of the following native plant species: *Acacia koa*, *Alyxia oliviformis*, *Antidesma* spp., *Bobea timonioides*, *Caesalpinia kavaianse*, *Canavalia* spp., *Carex meyenii*, *Carex wahuensis*, *Doodia kunthiana*, *Hibiscus waimeae*, *Kokia kauaiensis*, *Melicope knudsenii*, *Microlepis strigosa*, *Munroidendron racemosum*, *Myrsine lanaiensis*, *Nesoluma polynesicum*, *Nestegis sandwicensis*, *Pisonia* spp., *Pleomele aurea*, *Pouteria sandwicensis*, *Psychotria* spp., *Psychotria odorata*, *Pteralyxia kauaiensis*, *Rauvolfia sandwicensis*, *Streblus pendulinus*, *Tetraplasandra* spp., *Xylosma* spp., or *Zanthoxylum* spp.; and

(ii) Elevations between 343 and 954 m (1,126 and 3,129 ft).

Family Solanaceae: *Nothocestrum peltatum* (aiea)

Kauai 11—*Nothocestrum peltatum*—a, Kauai 11—*Nothocestrum peltatum*—b, Kauai 11—*Nothocestrum peltatum*—c, and Kauai 12—*Nothocestrum peltatum*—d, identified in the legal descriptions in paragraph (a)(1) of this section, constitute critical habitat for *Nothocestrum peltatum* on Kauai. 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 soil on steep slopes in mesic or wet forest dominated by *Acacia koa* or a mixture of *Acacia koa* and *Metrosideros polymorpha* and containing one or more of the following associated native plant species: *Alphitonia ponderosa*, *Antidesma* spp., *Bobea brevipes*, *Broussaisia arguta*, *Cheirodendron trigynum*, *Claoxylon sandwicense*, *Coprosma* spp., *Cryptocarya mannii*, *Dianella sandwicensis*, *Dicranopteris linearis*, *Diplazium sandwichianum*, *Dodonaea viscosa*, *Elaeocarpus bifidus*, *Hedyotis terminalis*, *Ilex anomala*, *Melicope anisata*, *Melicope barbigera*, *Melicope haupuensis*, *Perrottetia sandwicensis*, *Pleomele aurea*, *Pouteria sandwicensis*, *Psychotria mariniana*, *Psychotria greenwelliae*, *Tetraplasandra kavaianse*, or *Xylosma* spp.; and

(ii) Elevations between 581 and 1,290 m (1,906 and 4,232 ft).

Family Solanaceae: *Solanum sandwicense* (aiakeakua, popolo)

Kauai 11—*Solanum sandwicense*—a, and Kauai 11—*Solanum sandwicense*—b, identified in the legal descriptions in paragraph (a)(1) of this section, constitute critical habitat for *Solanum sandwicense* on Kauai. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Under forest canopies in diverse lowland or montane *Acacia koa* or *Acacia koa*-*Metrosideros polymorpha* mesic or wet forests and containing one or more of the following associated plant species: *Alphitonia ponderosa*, *Athyrium sandwicensis*, *Bidens* spp., *Carex meyenii*, *Coprosma* spp., *Cryptocarya mannii*, *Dianella sandwicensis*, *Dicranopteris linearis*, *Dubautia* spp., *Hedyotis* spp., *Ilex anomala*, *Melicope* spp., *Poa* spp., *Pouteria sandwicensis*, *Psychotria* spp., *Syzygium sandwicensis*, or *Xylosma hawaiiense*; and

(ii) Elevations between 540 and 1,290 m (1,770 and 4,232 ft).

Family Violaceae: *Isodendron laurifolium* (aupaka)

Kauai 11—*Isodendron laurifolium*—a, and Kauai 11—*Isodendron laurifolium*—b, identified in the legal descriptions in paragraph (a)(1) of this section, constitute critical habitat for *Isodendron laurifolium* on Kauai. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Diverse mesic forest dominated by *Metrosideros polymorpha*, *Acacia koa* or *Diospyros* spp. and containing one or more of the following associated native plant species: *Alphitonia ponderosa*, *Antidesma* spp., *Claoxylon sandwicense*, *Dodonaea viscosa*, *Dubautia* spp., *Elaeocarpus bifidus*, *Euphorbia haeleleana*, *Hedyotis terminalis*, *Kokia kauaiensis*, *Melicope anisata*, *Melicope barbigera*, *Melicope ovata*, *Melicope peduncularis*, *Myrsine lanaiensis*, *Nestegis sandwicensis*, *Pisonia* spp., *Pittosporum glabrum*, *Pleomele aurea*, *Pouteria sandwicensis*, *Psychotria odorata*, *Streblus pendulinus*, or *Xylosma hawaiiense*; and

(ii) Elevations between 397 and 1,164 m (1,303 and 3,817 ft).

Family Violaceae: *Isodendron longifolium* (aupaka)

Kauai 7—*Isodendron longifolium*—a, Kauai 10—*Isodendron longifolium*—b, Kauai 11—*Isodendron longifolium*—c, Kauai 11—*Isodendron longifolium*—d,

and Kauai 11—*Isodendron longifolium*—e, identified in the legal descriptions in paragraph (a)(1) of this section, constitute critical habitat for *Isodendron longifolium* on Kauai.

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, gulches, or streambanks and flats in undisturbed areas, in mesic or wet *Metrosideros polymorpha*-*Acacia koa* forests and containing one or more of the following native species: *Antidesma* spp., *Bidens* spp., *Bobea brevipes*, *Cheirodendron* spp., *Cibotium* spp., *Cyanea hardyi*, *Cyrtandra* spp., *Dicranopteris linearis*, *Diospyros* spp., *Eugenia reinwardtiana*, *Hedyotis* spp., *Ilex anomala*, *Melicope* spp., *Nestegis sandwicensis*, *Peperomia* spp., *Perrottetia sandwicensis*, *Pipturus* spp., *Pittosporum* spp., *Pritchardia* spp., *Psychotria* spp., *Psydrax odorata*, or *Syzygium sandwicensis*; and

(ii) Elevations between 127 and 1,295 m (418 and 4,246 ft).

Family Violaceae: *Viola helenae* (NCN)

Kauai 10—*Viola helenae*—a, identified in the legal description in paragraph (a)(1) of this section, constitutes critical habitat for *Viola helenae* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Stream drainage banks or adjacent valley bottoms in light to moderate shade in *Metrosideros polymorpha*-*Dicranopteris linearis* lowland wet forest or *Metrosideros polymorpha*-*Cheirodendron* wet forest and containing one or more of the following native plant species: *Antidesma platyphyllum* var. *hillebrandii*, *Broussaisia arguta*, *Dicranopteris linearis*, *Diplazium sandwichianum*, *Dubautia* spp., *Freycinetia arborea*, *Hesperomannia lydgatei*, *Melicope* spp., or *Pritchardia* spp.; and

(ii) Elevations between 522 and 1,006 m (1,712 and 3,301 ft).

Family Violaceae: *Viola kauaiensis* var. *wahiawaensis* (nani waialeale)

Kauai 10—*Viola kauaiensis* var. *wahiawaensis*—a, identified in the legal description in paragraph (a)(1) of this section, constitutes critical habitat for *Viola kauaiensis* var. *wahiawaensis* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) *Machaerina angustifolia*-*Rhynchospora rugosa* lowland bog or mixed wet shrubland and adjacent *Metrosideros polymorpha* wet forest and containing one or more of the following native plant species: *Antidesma platyphyllum* var. *hillebrandii*, *Bidens forbesii*, *Chamaesyce remyi*, *Chamaesyce sparsiflora*, *Coprosma* spp., *Cyanea fissa*, *Dicranopteris linearis*, *Diplopterygium pinnatum*, *Dubautia imbricata*, *Dubautia raillardii*, *Gahnia vitiensis*, *Leptecophylla tameiameia*, *Lobelia kauaensis*, *Machaerina angustifolia*, *Machaerina mariscoides*, *Melicope* spp., *Psychotria wawrae*, *Sadleria pallida*, *Scaevola gaudichaudii*, *Sphenomeris chinensis*, *Syzygium sandwicensis*, *Tetraplasandra oahuensis*, or *Vaccinium dentatum*; and

(ii) Elevations between 394 and 1,006 m (1,291 and 3,301 ft).

(2) Ferns and allies.

Family Aspleniaceae: *Diellia erecta* (no common name)

Kauai 11—*Diellia erecta*—a, identified in the legal description in paragraph (a)(1) of this section, constitutes critical habitat for *Diellia erecta* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Brown granular soil with leaf litter and occasional terrestrial moss on north-facing slopes in deep shade on steep slopes or gulch bottoms in *Metrosideros polymorpha*-*Dicranopteris linearis* wet forest or *Metrosideros polymorpha* mixed mesic forest with *Acacia koa* and *Acacia koa* as co-dominants and containing one or more of the following native plant species: *Asplenium aethiopicum*, *Asplenium contiguum*, *Asplenium macraei*, *Coprosma* spp., *Dodonaea viscosa*, *Dryopteris fuscoides*, *Dryopteris unidentata*, *Hedyotis terminalis*, *Leptecophylla tameiameia*, *Melicope* spp., *Microlepia strigosa*, *Myrsine* spp., *Nestegis sandwicensis*, *Psychotria* spp., *Syzygium sandwicensis*, or *Wikstroemia* spp.; and

(ii) Elevations between 655 and 1,224 m (2,149 and 4,016 ft).

Family Aspleniaceae: *Diellia pallida* (no common name)

Kauai 11—*Diellia pallida*—a, and Kauai 11—*Diellia pallida*—b, identified in the legal descriptions in paragraph (a)(1) of this section, constitute critical habitat for *Diellia pallida* on Kauai. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Bare granular soil with dry to mesophytic leaf litter with a pH of 6.9 to 7.9 on steep talus slopes in lowland mesic forests and containing one or more of the following native plant species: *Acacia koa*, *Alectryon macrococcus*, *Alphitonia ponderosa*, *Alyxia oliviformis*, *Antidesma platyphyllum*, *Asplenium* spp., *Carex meyenii*, *Diospyros hillebrandii*, *Diospyros sandwicensis*, *Doodia kunthiana*, *Hedyotis knudsenii*, *Leptecophylla tameiameia*, *Metrosideros polymorpha*, *Microlepia strigosa*, *Myrsine lanaiensis*, *Nestegis sandwicensis*, *Psychotria mariniana*, *Psydrax odorata*, *Pteralyxia kauaiensis*, *Rauvolfia sandwicensis*, *Tetraplasandra kawaiensis*, *Wilkesia gymnoxiphium*, or *Zanthoxylum dipetalum*; and

(ii) Elevations between 445 and 1,028 m (1,461 and 3,371 ft).

Family Aspleniaceae: *Diplazium molokaiense* (NCN)

Kauai 11—*Diplazium molokaiense*—a, identified in the legal description in paragraph (a)(1) of this section, constitutes critical habitat for *Diplazium molokaiense* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Brown soil with basalt outcrops near waterfalls in lowland or montane mesic *Metrosideros polymorpha*-*Acacia koa* forest; and

(ii) Elevations between 624 and 1,234 m (2,048 and 4,048 ft).

Family Aspleniaceae: *Ctenitis squamigera* (pauoa)

Kauai 11—*Ctenitis squamigera*—a, identified in the legal description in paragraph (a)(1) of this section, constitutes critical habitat for *Ctenitis squamigera* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Rock faces in gulches in the understory of *Metrosideros polymorpha*-*Diospyros* spp. mesic forest and diverse mesic forest and containing one or more of the following native plant species: *Myrsine* spp., *Psychotria* spp., or *Xylosma* spp.; and

(ii) Elevations between 538 and 1,069 m (1,765 and 3,507 ft).

Family Grammitidaceae: *Adenophorus periens* (pendent kihi fern)

Kauai 4—*Adenophorus periens*—a, Kauai 10—*Adenophorus periens*—b, Kauai 11—*Adenophorus periens*—c, and Kauai 11—*Adenophorus periens*—d, identified in the legal descriptions in

paragraph (a)(1) of this section, constitute critical habitat for *Adenophorus periens* on Kauai. Within these units, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) On *Metrosideros polymorpha* trunks, in riparian banks of stream systems in well-developed, closed canopy that provides deep shade or high humidity in *Metrosideros polymorpha*-*Cibotium glaucum* lowland wet forests, open *Metrosideros polymorpha* montane wet forest, or *Metrosideros polymorpha*-*Dicranopteris linearis* lowland wet forest and containing one or more of the following native plant species: *Antidesma platyphyllum*, *Athyrium sandwichianum*, *Broussaisia arguta*, *Cheirodendron trigynum*, *Cyanea* spp.,

Cyrtandra spp., *Dicranopteris linearis*, *Freycinetia arborea*, *Hedyotis terminalis*, *Labordia hirtella*, *Machaerina angustifolia*, *Psychotria* spp., *Syzygium sandwicensis*, or *Tetraplasandra oahuensis*; and
(ii) Elevations between 169 and 1,345 m (553 and 4,411 ft).

Family Lycopodiaceae:

***Phlegmariurus nutans* (wawaeiole)**

Kauai 10—*Phlegmariurus nutans*—a, identified in the legal description in paragraph (a)(1) of this section, constitutes critical habitat for *Phlegmariurus nutans* on Kauai. Within this unit, the currently known primary constituent elements of critical habitat include, but are not limited to, the habitat components provided by:

(i) Tree trunks, usually on open ridges and slopes in *Metrosideros polymorpha*-

Dicranopteris linearis wet or mesic forests and containing one or more of the following associated native plant species: *Antidesma platyphyllum*, *Broussaisia arguta*, *Cheirodendron fauriei*, *Cibotium* spp., *Diplopterygium pinnatum*, *Hedyotis terminalis*, *Hibiscus kokio* ssp. *kokio*, *Melicope waialealae*, *Perrottetia sandwicensis*, *Psychotria hexandra*, *Psychotria mariniana*, *Psychotria wawrae*, *Scaevola gaudichaudii*, or *Syzygium sandwicensis*; and

(ii) Elevations between 615 and 1,591 m (2,016 and 5,217 ft).

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Craig Manson,

Assistant Secretary for Fish and Wildlife and Parks.

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