AUTHENTICATED
U.S. GOVERNMENT
INFORMATION
GPO

FEDERAL REGISTER

Vol. 77 Monday,
No. 112 June 11, 2012

Part II

Department of the Interior

Fish and Wildlife Service

50 CFR Part 17

Endangered and Threatened Wildlife and Plants; Listing 38 Species on Molokai, Lanai, and Maui as Endangered and Designating Critical Habitat on Molokai, Lanai, Maui, and Kahoolawe for 135 Species; Proposed Rule

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket No. FWS–R1–ES–2011–0098; MO 92210–0–0009]

RIN 1018–AX14

Endangered and Threatened Wildlife and Plants; Listing 38 Species on Molokai, Lanai, and Maui as Endangered and Designating Critical Habitat on Molokai, Lanai, Maui, and Kahoolawe for 135 Species

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), propose to list 38 species on the Hawaiian Islands of Molokai, Lanai, and Maui as endangered under the Endangered Species Act of 1973, as amended (Act). We are also reaffirming the listing of two endemic Hawaiian plants currently listed as endangered. We propose to designate critical habitat for 39 of these 40 plant and animal species. Critical habitat is not determinable for the plant *Cyanea mauiensis.* In this document, we also propose to designate critical habitat for 11 previously listed plant and animal species that do not have designated critical habitat, and propose to revise critical habitat for 85 plant species that are already listed as endangered or threatened. The proposed critical habitat designation totals 271,062 acres (ac) (109,695 hectares (ha)) on the islands of Molokai, Lanai, Maui, and Kahoolawe (collectively called Maui Nui), and includes both occupied and unoccupied habitat. Approximately 47 percent of the area being proposed as critical habitat is already designated as critical habitat for the 85 plant species or other species. We also propose to delist the plant *Gahnia lanaiensis,* due to new information that this species is synonymous with *G. lacera,* a widespread species from New Zealand. In addition, we propose name changes or corrections for 11 endangered plants and 2 endangered birds, and taxonomic revisions for 2 endangered plant species.

DATES: We will consider comments received on or postmarked on or before August 10, 2012. Please note that if you are using the Federal eRulemaking Portal (see **ADDRESSES** section below), the deadline for submitting an electronic comment is 11:59 p.m. Eastern Time on this date. We must receive requests for public hearings, in writing, at the address shown in the **FOR FURTHER INFORMATION CONTACT** section by July 26, 2012.

ADDRESSES: You may submit comments by one of the following methods:

- *Federal eRulemaking Portal: http://www.regulations.gov.* Search for FWS–R1–ES–2011–0098, which is the docket number for this proposed rule.
- *U.S. mail or hand delivery:* Public Comments Processing, Attn: FWS–R1–ES–2011–0098; Division of Policy and Directives Management; U.S. Fish and Wildlife Service; 4401 N. Fairfax Drive, MS 2042–PDM; Arlington, VA 22203.

We will post all comments on *http://www.regulations.gov.* This generally means that we will post any personal information you provide us (see the Public Comments section below for more information).

FOR FURTHER INFORMATION CONTACT: Loyal Mehrhoff, Field Supervisor, Pacific Islands Fish and Wildlife Office, 300 Ala Moana Boulevard, Box 50088, Honolulu, HI 96850; by telephone at 808–792–9400; or by facsimile at 808–792–9581. If you use a telecommunications device for the deaf (TDD), call the Federal Information Relay Service (FIRS) at 800–877–8339.

SUPPLEMENTARY INFORMATION:

Executive Summary

Why we need to publish a rule. This is a proposed rule to list 38 species (35 plants and 3 tree snails) from the island cluster of Maui Nui (Molokai, Lanai, Maui, and Kahoolawe) in the State of Hawaii as endangered, and concurrently designate 271,062 acres as critical habitat. In this proposed rule, we are also proposing to revise critical habitat for 85 plants and proposing to designate critical habitat for 11 listed plants and animals that do not have designated critical habitat on these islands. Under the Endangered Species Act, we must issue a rule to list a species as endangered or threatened and, concurrently, designate critical habitat at the time a species is listed as threatened or endangered. We may, as appropriate, revise critical habitat designations. If adopted as proposed, this rule would establish an integrated, comprehensive, ecosystem-based critical habitat designation, which would allow the Service to better prioritize, direct, and focus conservation and recovery actions.

As part of a settlement agreement, we agreed to submit to the **Federal Register** a proposed rule for Maui Nui candidate species in fiscal year 2012. This action complies with the agreement.

This rule proposes the following:

- List 38 plants and animals as endangered species.
- Reaffirm the listing for two listed plants with taxonomic changes.
- Designate critical habitat for 37 of the 38 proposed species and for the two listed plants with taxonomic changes.
- Revise designated critical habitat for 85 listed plants.
- Designate critical habitat for 11 listed plants and animals that do not have designated critical habitat on these islands.

One or more of the 38 proposed species are threatened by:

- Habitat loss and degradation due to agriculture and urban development, nonnative feral ungulates (e.g., pigs, goats, axis deer) and plants, wildfire, hurricanes, flooding, and drought.
- Predation or herbivory by nonnative feral ungulates, rats, snails, and slugs.
- Inadequate existing regulatory mechanisms that prevent the introduction and spread of nonnative plants and animals.
- Small number of individuals and populations, and lack of reproduction in the wild.

This rule proposes critical habitat for 50 species and proposes critical habitat revisions for 85 listed plants:

- A total of 271,062 acres is proposed as critical habitat. Approximately 47 percent, or 127,407 acres, of the area being proposed as critical habitat is already designated as critical habitat for previously listed plant and animal species. Therefore, 53 percent, or 143,655 acres, of the proposed area is newly proposed critical habitat.
- The proposed critical habitat units are ecosystem-based and encompass areas essential for the conservation of multiple species.
- The proposed designation includes both occupied and unoccupied critical habitat, although those areas are not differentiated in the proposed rule or on the maps.
- We are considering excluding approximately 40,973 acres of privately owned lands on Maui and Molokai. These privately owned lands include The Nature Conservancy preserves, lands owned by East Maui Irrigation Company, Haleakala Ranch, Maui Land and Pineapple Company, and Ulupalakua Ranch.
- We are proposing critical habitat on lands owned by the U.S. Coast Guard, U.S. National Park Service, State of Hawaii, County of Maui, and private interests.

The basis for our action. Under the Endangered Species Act, we must issue a rule to list a species as endangered or threatened and, concurrently, designate critical habitat. We may, as appropriate, revise critical habitat designations. We are required to list species solely on the

basis of the best available scientific and commercial data available. A critical habitat designation must be based on the best available scientific data after taking into consideration economic and other impacts. We can exclude an area from critical habitat if the benefits of exclusion outweigh the benefits of designation, unless the exclusion will result in the extinction of the species.

We are preparing an economic analysis. To ensure that we consider the economic impacts of the proposed critical habitat designation, we are preparing an economic analysis that will:

- Rely on information from previous economic analyses that were prepared to evaluate the economic impact of critical habitat designation in the areas of Molokai, Lanai, Maui, and Kahoolawe that are currently designated as critical habitat (47 percent of the proposed designation).
- Update that information to consider economic impacts in the areas newly proposed as critical habitat in this rule (53 percent of the proposed designation).
- Address any other potential economic impacts that may have not been sufficiently considered.

We will publish an announcement and seek public comments on the draft economic analysis when it is completed.

We will seek peer review. We are seeking comments from independent specialists to ensure that our listing determinations and critical habitat designations are based on scientifically sound data, assumptions, and analyses. We have invited these peer reviewers to comment on our specific assumptions and conclusions regarding the 40 species proposed or reevaluated for listing, and the proposed designation of critical habitat.

Public Comments

We intend that any final action resulting from this proposal will be based on the best scientific and commercial data available and be as accurate and as effective as possible. Therefore, we solicit comments or suggestions on this proposed rule from the public, other concerned governmental agencies, the scientific community, industry, or other interested parties. We are proposing to list a total of 38 species (35 plants and 3 tree snails) as endangered; reevaluate the listing of 2 plant species; designate critical habitat for 39 of the 40 species we are proposing to list, or are reevaluating for listing, as endangered; designate critical habitat for 11 currently listed species that do not have designated critical habitat (9 plants and 2 birds); and revise the critical habitat designation for 85 plant species on the islands of Molokai, Lanai, Maui, and Kahoolawe. We particularly seek comments concerning:

(1) Biological, commercial trade, or other relevant data concerning threats (or the lack thereof) to the 40 species proposed or reevaluated for listing, and regulations that may be addressing those threats.

(2) Additional information concerning the range, distribution, and population sizes of each of the 40 species proposed or reevaluated for listing, including the locations of any additional populations of these species.

(3) Any information on the biological or ecological requirements of the 40 species proposed or reevaluated for listing.

(4) The reasons why we should or should not designate areas for any of the species in this proposal as ''critical habitat'' under section 4 of the Endangered Species Act of 1973, as amended (Act) (16 U.S.C. 1531 *et seq.*), including whether there are threats to these species from human activity, the degree to which can be expected to increase due to the designation, and whether the benefit of designation would outweigh threats to these species caused by the designation, such that the designation of critical habitat is prudent.

(5) Whether a revision of critical habitat is warranted for the 85 plant species that are already listed as endangered or threatened under the Act and that currently have designated critical habitat.

(6) Specific information on:

- The amount and distribution of critical habitat for the species included in this proposed rule;
- What areas currently occupied, and that contain the necessary physical or biological features essential for the conservation of the species, we should include in the designation and why;
- Whether special management considerations or protections may be required for the physical or biological features essential to the conservation of the species in this proposed rule; and
- What areas not currently occupied are essential to the conservation of the species and why.

(7) Land use designations and current or planned activities in the areas occupied or unoccupied by the species and proposed as critical habitat, and the possible impacts of these activities on these species, or of critical habitat on these designations or activities.

(8) Any foreseeable economic, national security, or other relevant impacts of designating any area as critical habitat. We are particularly interested in any impacts on small entities, and the benefits of including or excluding areas that may experience these impacts.

(9) Whether the benefits of excluding any particular area from critical habitat outweigh the benefits of including that area as critical habitat under section 4(b)(2) of the Act, after considering the potential impacts and benefits of the proposed critical habitat designation. Under section 4(b)(2), the Secretary may exclude an area from critical habitat if he or she determines that the benefits of such exclusion outweigh the benefits of including that particular area as critical habitat, unless failure to designate that specific area as critical habitat will result in the extinction of the species. We request specific information on:

- The benefits of including specific areas in the final designation and supporting rationale;
- The benefits of excluding specific areas from the final designation and supporting rationale; and
- Whether any specific exclusions may result in the extinction of the species and why.

(10) Whether the proposed critical habitat on private lands and under consideration for exclusion under section 4(b)(2) of the Act should or should not be excluded and why.

(11) Information on the projected and reasonably likely impact of climate change on the species included in this proposed rule.

(12) Information on any special management needs or protections that may be needed in the critical habitat areas we are proposing.

(13) Whether we could improve or modify our approach to designating critical habitat in any way to provide for greater public participation and understanding, or to better accommodate public concerns and comments.

(14) Specific information on ways to improve the clarity of this rule as it pertains to completion of consultations under section 7 of the Act.

(15) Comments on our proposal to revise taxonomic classification with name changes or family changes for 11 plant species and 2 bird species identified in this proposed rule.

You may submit your comments and materials concerning this proposed rule by one of the methods listed in the **ADDRESSES** section. We request that you send comments only by the methods described in the **ADDRESSES** section.

We will post your entire comment—including your personal identifying information—on *http://www.regulations.gov*. If you

provide personal identifying information in your comment, such as your street address, phone number, or email address, you may request at the top of your document that we withhold this information from public review. However, we cannot guarantee that we will be able to do so.

Comments and materials we receive, as well as supporting documentation we used in preparing this proposed rule, will be available for public inspection at *http://www.regulations.gov*, or by appointment, during normal business hours, at the U.S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office (see **FOR FURTHER INFORMATION CONTACT**).

You may obtain copies of the proposed rule by mail from the Pacific Islands Fish and Wildlife Office (see **FOR FURTHER INFORMATION CONTACT**) or by visiting the Federal eRulemaking Portal at *http://www.regulations.gov*.

Background

Maui Nui Species Addressed in This Proposed Rule

The table below (Table 1) provides the common name, scientific name, listing status, and critical habitat status for the species that are the subjects of this proposed rule.

TABLE 1—THE MAUI NUI SPECIES ADDRESSED IN THIS PROPOSED RULE

[Note that many of the species share the same common name. "E" denotes endangered status under the Act; "C" denotes a species currently on the candidate list]

Scientific name	Common name(s)	Listing status	Critical habitat status
Species Proposed for Listing as Endangered			
Plants:			
Bidens campylotheca ssp. *pentamera*.	kookoolau	Proposed—Endangered (C)	Proposed.
Bidens campylotheca ssp. *waihoiensis*.	kookoolau	Proposed—Endangered (C)	Proposed.
Bidens conjuncta	kookoolau	Proposed—Endangered (C)	Proposed.
Calamagrostis hillebrandii	[NCN]	Proposed—Endangered (C)	Proposed.
Canavalia pubescens	awikiwiki	Proposed—Endangered (C)	Proposed.
Cyanea asplenifolia	haha	Proposed—Endangered (C)	Proposed.
Cyanea duvalliorum	haha	Proposed—Endangered	Proposed.
Cyanea horrida	haha nui	Proposed—Endangered	Proposed.
Cyanea kunthiana	haha	Proposed—Endangered (C)	Proposed.
Cyanea magnicalyx	haha	Proposed—Endangered	Proposed.
Cyanea maritae	haha	Proposed—Endangered	Proposed.
Cyanea mauiensis	haha	Proposed—Endangered	Not determinable.
Cyanea munroi	haha	Proposed—Endangered	Proposed.
Cyanea obtusa	haha	Proposed—Endangered (C)	Proposed.
Cyanea profuga	haha	Proposed—Endangered	Proposed.
Cyanea solanacea	popolo	Proposed—Endangered	Proposed.
Cyrtandra ferripilosa	haiwale	Proposed—Endangered	Proposed.
Cyrtandra filipes	haiwale	Proposed—Endangered (C)	Proposed.
Cyrtandra oxybapha	haiwale	Proposed—Endangered (C)	Proposed.
Festuca molokaiensis	[NCN]	Proposed—Endangered	Proposed.
Geranium hanaense	nohoanu	Proposed—Endangered (C)	Proposed.
Geranium hillebrandii	nohoanu	Proposed—Endangered (C)	Proposed.
Mucuna sloanei var. *persericea*.	sea bean	Proposed—Endangered	Proposed.
Myrsine vaccinioides	kolea	Proposed—Endangered (C)	Proposed.
Peperomia subpetiolata	alaala wai nui	Proposed—Endangered (C)	Proposed.
Phyllostegia bracteata	[NCN]	Proposed—Endangered (C)	Proposed.
Phyllostegia haliakalae	[NCN]	Proposed—Endangered	Proposed.
Phyllostegia pilosa	[NCN]	Proposed—Endangered	Proposed.
Pittosporum halophilum	hoawa	Proposed—Endangered	Proposed.
Pleomele fernaldii	hala pepe	Proposed—Endangered (C)	Proposed.
Schiedea jacobii	[NCN]	Proposed—Endangered	Proposed.
Schiedea laui	[NCN]	Proposed—Endangered	Proposed.
Schiedea salicaria	[NCN]	Proposed—Endangered (C)	Proposed.
Stenogyne kauaulaensis	[NCN]	Proposed—Endangered	Proposed.
Wikstroemia villosa	akia	Proposed—Endangered	Proposed.
Animals:			
Newcombia cumingi	Newcomb's tree snail	Proposed—Endangered (C)	Proposed.
Partulina semicarinata	Lanai tree snail	Proposed—Endangered (C)	Proposed.
Partulina variabilis	Lanai tree snail	Proposed—Endangered (C)	Proposed.
Species Reevaluated for Listing			
Cyanea grimesiana ssp. *grimesiana*.	haha	Reevaluation of Listing—Endangered.	Proposed revision.
Santalum freycinetianum var. *lainaiense* (taxonomic revision proposed, to *S. h.* var. *lanaiense*).	iliahi	Reevaluation of Listing—Endangered.	Proposed.

Scientific name	Common name(s)	Listing status	Status of existing critical habitat
Listed Species Without Critical Habitat Designations			
Plants:			
Abutilon eremitopetalum	[NCN]	Listed 1991—E	None—Proposed.
Acaena exigua	liliwai	Listed 1992—E	None—Proposed.*
Cyanea macrostegia ssp. *gibsonii* (taxonomic revision proposed, to *C. gibsonii*).	haha	Listed 1991—E	None—Proposed.
Hedyotis schlechtendahliana var. *remyi* (taxonomic revision proposed, to *Kadua cordata* ssp. *remyi*).	kopa	Listed 1999—E	None—Proposed.
Kokia cookei	Cooke's kokio	Listed 1979—E	None—Proposed.*
Labordia tinifolia var. *lanaiensis*.	kamakahala	Listed 1999—E	None—Proposed.
Melicope munroi	alani	Listed 1999—E	None—Proposed.
Phyllostegia hispida	[NCN]	Listed 2009—E	None—Proposed.†
Viola lanaiensis	[NCN]	Listed 1991—E	None—Proposed.
Animals:			
Palmeria dolei	Akohekohe, crested honeycreeper	Listed 1967—E	None—Proposed.‡
Pseudonestor xanthophrys	Kiwikiu, Maui parrotbill	Listed 1967—E	None—Proposed.‡

Scientific name	Common name(s)	Year of critical habitat designation—current proposed action
Listed Species for Which Revisions to Existing Critical Habitat Are Proposed		
Adenophorus periens	pendent kihi fern	2003—Proposed Revision of Critical Habitat
Alectryon macrococcus	mahoe	2003—Proposed Revision of Critical Habitat
Argyroxiphium sandwicense ssp. *macrocephalum*.	ahinahina (= Haleakala silversword)	2003—Proposed Revision of Critical Habitat
Asplenium fragile var. *insulare* (taxonomic revision proposed, to *A. peruvianum* var. *insulare*).	[NCN]	2003—Proposed Revision of Critical Habitat
Bidens micrantha ssp. *kalealaha*	kookoolau	2003—Proposed Revision of Critical Habitat
Bidens wiebkei	kookoolau	2003—Proposed Revision of Critical Habitat
Bonamia menziesii	[NCN]	2003—Proposed Revision of Critical Habitat
Brighamia rockii	pua ala	2003—Proposed Revision of Critical Habitat
Canavalia molokaiensis	awikiwiki	2003—Proposed Revision of Critical Habitat
Cenchrus agrimonioides	kamanomano (= sandbur, agrimony)	2003—Proposed Revision of Critical Habitat
Centaurium sebaeoides (taxonomic revision proposed, to *Schenkia sebaeoides*).	awiwi	2003—Proposed Revision of Critical Habitat
Clermontia lindseyana	oha wai	2003—Proposed Revision of Critical Habitat
Clermontia oblongifolia ssp. *brevipes*	oha wai	2003—Proposed Revision of Critical Habitat
Clermontia oblongifolia ssp. *mauiensis*	oha wai	2003—Proposed Revision of Critical Habitat
Clermontia peleana	oha wai	2003—Proposed Revision of Critical Habitat
Clermontia samuelii	oha wai	2003—Proposed Revision of Critical Habitat
Colubrina oppositifolia	kauila	2003—Proposed Revision of Critical Habitat
Ctenitis squamigera	pauoa	2003—Proposed Revision of Critical Habitat
Cyanea copelandii ssp. *haleakalaensis*	haha	2003—Proposed Revision of Critical Habitat
Cyanea dunbarii (spelling correction proposed, to *C. dunbariae*).	haha	2003—Proposed Revision of Critical Habitat
Cyanea glabra	haha	2003—Proposed Revision of Critical Habitat
Cyanea hamatiflora ssp. *hamatiflora*	haha	2003—Proposed Revision of Critical Habitat
Cyanea lobata	haha	2003—Proposed Revision of Critical Habitat
Cyanea mannii	haha	2003—Proposed Revision of Critical Habitat
Cyanea mceldowneyi	haha	2003—Proposed Revision of Critical Habitat
Cyanea procera	haha	2003—Proposed Revision of Critical Habitat
Cyperus trachysanthos	puukaa	2003—Proposed Revision of Critical Habitat
Cyrtandra munroi	haiwale	2003—Proposed Revision of Critical Habitat
Diellia erecta (taxonomic revision proposed, to *Asplenium dielerectum*).	Asplenium-leaved diellia	2003—Proposed Revision of Critical Habitat
Diplazium molokaiense	[NCN]	2003—Proposed Revision of Critical Habitat
Dubautia plantaginea ssp. *humilis*	naenae	2003—Proposed Revision of Critical Habitat
Eugenia koolauensis	nioi	2003—Proposed Revision of Critical Habitat
Flueggea neowawraea	mehamehame	2003—Proposed Revision of Critical Habitat
Geranium arboreum	Hawaiian red-flowered geranium	2003—Proposed Revision of Critical Habitat
Geranium multiflorum	nohoanu	2003—Proposed Revision of Critical Habitat
Gouania hillebrandii	[NCN]	1984—Proposed Revision of Critical Habitat
Gouania vitifolia	[NCN]	2003—Proposed Revision of Critical Habitat

Scientific name	Common name(s)	Year of critical habitat designation—current proposed action
Hedyotis coriacea (taxonomic revision proposed, to *Kadua coriacea* **).	kioele	2003—Proposed Revision of Critical Habitat
Hedyotis mannii (taxonomic revision proposed, to *Kadua laxiflora*).	pilo	2003—Proposed Revision of Critical Habitat
Hesperomannia arborescens	[NCN]	2003—Proposed Revision of Critical Habitat
Hesperomannia arbuscula	[NCN]	2003—Proposed Revision of Critical Habitat
Hibiscus arnottianus ssp. *immaculatus*	kokio keokeo	2003—Proposed Revision of Critical Habitat
Hibiscus brackenridgei	mao hau hele	2003—Proposed Revision of Critical Habitat
Huperzia mannii	wawaeiole	2003—Proposed Revision of Critical Habitat
Ischaemum byrone	Hilo ischaemum	2003—Proposed Revision of Critical Habitat
Isodendrion pyrifolium	wahine noho kula	2003—Proposed Revision of Critical Habitat
Kanaloa kahoolawensis	kohe malama malama o kanaloa	2003—Proposed Revision of Critical Habitat
Labordia triflora	kamakahala	2003—Proposed Revision of Critical Habitat
Lipochaeta kamolensis (taxonomic revision proposed, to *Melanthera kamolensis*).	nehe	2003—Proposed Revision of Critical Habitat
Lysimachia lydgatei	[NCN]	2003—Proposed Revision of Critical Habitat
Lysimachia maxima	[NCN]	2003—Proposed Revision of Critical Habitat
Mariscus fauriei (taxonomic revision proposed, to *Cyperus fauriei*).	[NCN]	2003—Proposed Revision of Critical Habitat
Mariscus pennatiformis (taxonomic revision proposed, to *Cyperus pennatiformis* **).	[NCN]	2003—Proposed Revision of Critical Habitat
Marsilea villosa	ihi ihi	2003—Proposed Revision of Critical Habitat
Melicope adscendens	alani	2003—Proposed Revision of Critical Habitat
Melicope balloui	alani	2003—Proposed Revision of Critical Habitat
Melicope knudsenii	alani	2003—Proposed Revision of Critical Habitat
Melicope mucronulata	alani	2003—Proposed Revision of Critical Habitat
Melicope ovalis	alani	2003—Proposed Revision of Critical Habitat
Melicope reflexa	alani	2003—Proposed Revision of Critical Habitat
Neraudia sericea	[NCN]	2003—Proposed Revision of Critical Habitat
Nototrichium humile	kului	2003—Proposed Revision of Critical Habitat
Peucedanum sandwicense	makou	2003—Proposed Revision of Critical Habitat
Phyllostegia mannii	[NCN]	2003—Proposed Revision of Critical Habitat
Plantago princeps	laukahi kuahiwi	2003—Proposed Revision of Critical Habitat
Platanthera holochila	[NCN]	2003—Proposed Revision of Critical Habitat
Portulaca sclerocarpa	poe	2003—Proposed Revision of Critical Habitat
Pteris lidgatei	[NCN]	2003—Proposed Revision of Critical Habitat
Remya mauiensis	Maui remya	2003—Proposed Revision of Critical Habitat
Sanicula purpurea	[NCN]	2003—Proposed Revision of Critical Habitat
Schiedea haleakalensis	[NCN]	2003—Proposed Revision of Critical Habitat
Schiedea lydgatei	[NCN]	2003—Proposed Revision of Critical Habitat
Schiedea sarmentosa	[NCN]	2003—Proposed Revision of Critical Habitat
Sesbania tomentosa	ohai	2003—Proposed Revision of Critical Habitat
Silene alexandri	[NCN]	2003—Proposed Revision of Critical Habitat
Silene lanceolata	[NCN]	2003.
Solanum incompletum	popolo ku mai	2003—Proposed Revision of Critical Habitat
Spermolepis hawaiiensis	[NCN]	2003—Proposed Revision of Critical Habitat
Stenogyne bifida	[NCN]	2003—Proposed Revision of Critical Habitat
Tetramolopium capillare	pamakani	2003—Proposed Revision of Critical Habitat
Tetramolopium lepidotum ssp. *lepidotum*	[NCN]	2003—Proposed Revision of Critical Habitat
Tetramolopium remyi	[NCN]	2003—Proposed Revision of Critical Habitat
Tetramolopium rockii	[NCN]	2003—Proposed Revision of Critical Habitat
Vigna o-wahuensis	[NCN]	2003—Proposed Revision of Critical Habitat
Zanthoxylum hawaiiense	ae	2003—Proposed Revision of Critical Habitat

[NCN] = no common name.
* Critical habitat was found to be not prudent at the time of listing, and therefore was not designated at that time.
† Critical habitat was found to be prudent but not determinable at the time of listing.
‡ The requirement that the designation of critical habitat be considered was enacted in 1978.
** Taxonomic revision proposed in our August 2, 2011 proposed rule Listing 23 Species on Oahu as Endangered and Designating Critical Habitat for 124 Species (76 FR 46362).

Previous Federal Actions

Twenty of the 40 species proposed or reevaluated for listing are candidate species (75 FR 69222; November 10, 2010). Candidate species are those taxa for which the Service has sufficient information on their biological status and threats to propose them for listing under the Act, but for which the development of a listing regulation has been precluded to date by other higher priority listing activities. The current candidate species addressed in this proposed listing rule include the 17 plants *Bidens campylotheca* ssp. *pentamera, B. campylotheca* ssp. *waihoiensis, B. conjuncta, Calamagrostis hillebrandii, Canavalia pubescens, Cyanea asplenifolia, C. kunthiana, C. obtusa, Cyrtandra filipes, C. oxybapha, Geranium hanaense, G. hillebrandii, Myrsine vaccinioides, Peperomia subpetiolata, Phyllostegia bracteata, Pleomele fernaldii,* and

Schiedea salicaria; and the 3 tree snails *Newcombia cumingi, Partulina semicarinata* and *P. variabilis*. The candidate status of all of these species was most recently assessed and reaffirmed in the November 10, 2010, Review of Native Species That Are Candidates for Listing as Endangered or Threatened (CNOR) (75 FR 69222).

On May 4, 2004, the Center for Biological Diversity petitioned the Secretary of the Interior to list 225 species of plants and animals, including the 20 candidate species listed above, as endangered or threatened under the Act. Since then, we have published our annual findings on the May 4, 2004, petition (including our findings on the 20 candidate species listed above) in the CNORs dated May 11, 2005 (70 FR 24870), September 12, 2006 (71 FR 53756), December 6, 2007 (72 FR 69034), December 10, 2008 (73 FR 75176), November 9, 2009 (74 FR 57804), and November 10, 2010 (75 FR 69222). This proposed rule constitutes a further response to the 2004 petition.

On November 9, 1984, we published a final rule designating 112 ac (45 ha) on Maui as critical habitat for *Gouania hillebrandii* (49 FR 44753). On January 9, 2003, we published a final rule designating approximately 789 ac (320 ha) as critical habitat for 3 plant species on Lanai (68 FR 1220), and on March 18, 2003, we published a final rule designating approximately 24,333 ac (9,843 ha) as critical habitat for 41 plant species on Molokai (68 FR 12982). On May 14, 2003, we published a final rule designating approximately 93,200 ac (37,717 ha) on the island of Maui and 2,915 ac (1,180 ha) on the island of Kahoolawe as critical habitat for 60 plant species on Maui and Kahoolawe (68 FR 25934). We are proposing to revise the 1984 and 2003 critical habitat designations on the islands of Molokai, Lanai, Maui, and Kahoolawe in this rule. In addition, we are proposing critical habitat for the listed plants *Abutilon eremitopetalum* (56 FR 47686, September 20, 1991), *Acaena exigua* (57 FR 20772, May 15, 1992), *Cyanea gibsonii* (currently listed as *Cyanea macrostegia* ssp. *gibsonii* (56 FR 47686, September 20, 1991)), *Kadua cordata* ssp. *remyi* (currently listed as *Hedyotis schlechtendahliana* var. *remyi* (64 FR 48307, September 3, 1999)), *Kokia cookei* (44 FR 62470, October 30, 1979), *Labordia tinifolia* var. *lanaiensis* (64 FR 48307, September 3, 1999), *Melicope munroi* (64 FR 48307, September 3, 1999), *Phyllostegia hispida* (74 FR 11319, March 17, 2009), *Viola lanaiensis* (56 FR 47686, September 20, 1991)), and the birds akohekohe or crested honeycreeper and kiwikiu or Maui parrotbill (32 FR 4001; March 11, 1967)) for which critical habitat has not been previously designated.

In addition to the 20 candidate species, we are proposing to list 15 plant species that have been identified as the ''rarest of the rare'' Hawaiian plant species and in need of immediate conservation under the multi-agency (Federal, State, and private) Plant Extinction Prevention Program (PEPP). The goal of PEPP is to prevent the extinction of plant species that currently have fewer than 50 individuals remaining in the wild on the islands of Kauai, Oahu, Molokai, Lanai, Maui, and Hawaii (Hawaii Division of Forestry and Wildlife (DOFAW) 2010). The 15 species of plants identified by PEPP from the islands of Molokai, Lanai, or Maui include: *Cyanea horrida, C. magnicalyx, C. maritae, C. mauiensis, C. munroi, C. profuga, C. solanacea, Festuca molokaiensis, Phyllostegia haliakalae, P. pilosa, Pittosporum halophilum, Schiedea jacobii, S. laui, Stenogyne kauaulaensis,* and *Wikstroemia villosa*. We believe these 15 plant species warrant listing under the Act for the reasons discussed in the ''Summary of Factors Affecting the Species'' section (below). Because these 15 plant species occur within 5 of the ecosystems identified in this proposed rule, and share common threats with the other 25 species in these ecosystems proposed or reevaluated for listing under the Act, we have included them in this proposed rule to provide them with protection under the Act in an expeditious manner.

We are also proposing to list three other plant species (*Cyanea duvalliorum, Cyrtandra ferripilosa,* and *Mucuna sloanei* var. *persericea*) reported from Maui. We believe these three Maui plant species warrant listing under the Act for the reasons discussed in the ''Summary of Factors Affecting the Species'' section (below). Because these three plant species occur within three of the ecosystems identified in this proposed rule, and share common threats with the other 37 species proposed or reevaluated for listing in these ecosystems under the Act, we have included them in this proposed rule to provide them with protection under the Act in an expeditious manner.

Finally, we are reevaluating the listing of *Cyanea grimesiana* ssp. *grimesiana* and *Santalum haleakalae* var. *lanaiense,* both of which have undergone taxonomic changes since they were originally listed in 1996 and 1986, respectively.

Proposed Taxonomic Changes and Spelling Corrections Since Listing for 2 Bird Species and 11 Plant Species From Maui Nui

Below is a brief discussion on each of the proposed taxonomic or spelling changes, in alphabetical order by genus, starting with the 2 bird species, followed by 11 plant species. In brief, we propose to accept the recently adopted Hawaiian common name, kiwikiu, for the Maui parrotbill. We also propose to add the Hawaiian common name, akohekohe, to the listing for the crested honeycreeper. Additionally, based on recent botanical work, we propose to accept various taxonomic changes and spelling corrections for 11 endangered plant species listed between 1991 and 1999 (Table 1A).

TABLE 1A—PROPOSED TAXONOMIC CHANGES AND SPELLING CORRECTIONS FOR 2 LISTED ENDANGERED HAWAIIAN BIRDS AND 11 LISTED ENDANGERED HAWAIIAN PLANTS

Listing	Family	Name as currently listed	Proposed new name	Type of change	Change in range of listed entity?
Birds:					
32 FR 4001	Fringillidae	Maui parrotbill (*Pseudonestor xanthophrys*)	Kiwikiu, Maui parrotbill (*Pseudonestor xanthophrys*)	Add Hawaiian common name.	No.
32 FR 4001	Fringillidae	Crested honeycreeper (*Palmeria dolei*)	Akohekohe, crested honeycreeper (*Palmeria dolei*)	Add Hawaiian common name.	No.
Plants:					
59 FR 49025	Aspleniaceae	*Asplenium fragile* var. *insulare*.	*Asplenium peruvianum* var. *insulare*.	New genus	No.

TABLE 1A—PROPOSED TAXONOMIC CHANGES AND SPELLING CORRECTIONS FOR 2 LISTED ENDANGERED HAWAIIAN BIRDS AND 11 LISTED ENDANGERED HAWAIIAN PLANTS—Continued

Listing	Family	Name as currently listed	Proposed new name	Type of change	Change in range of listed entity?
56 FR 55770	Gentianaceae	*Centaurium sebaeoides*	*Schenkia sebaeoides*	New genus	No.
61 FR 53130	Campanulaceae	*Cyanea dunbarii*	*Cyanea dunbariae*	Spelling correction	No.
56 FR 47686	Campanulaceae	*Cyanea macrostegia* ssp. *gibsonii.*	*Cyanea gibsonii*	From subspecies to full species.	No.
59 FR 56333	Aspleniaceae	*Diellia erecta*	*Asplenium dielerectum*	New scientific name	No.
64 FR 48307	Rubiaceae	*Hedyotis schlechtendahliana* var. *remyi*	*Kadua cordata* ssp. *remyi.*	New scientific name	No.
57 FR 46325	Rubiaceae	*Hedyotis mannii*	*Kadua laxiflora*	New scientific name	No.
57 FR 20772	Asteraceae	*Lipochaeta kamolensis*	*Melanthera kamolensis*	New genus	No.
59 FR 10305	Cyperaceae	*Mariscus fauriei*	*Cyperus fauriei*	New genus	No.
57 FR 20772	Lycopodiaceae	*Phlegmariurus mannii*	*Huperzia mannii*	Consolidate entries	No.
51 FR 3182	Santalaceae	*Santalum freycinetianum* var. *lanaiense.*	*Santalum haleakalae* var. *lanaiense.*	New genus	Yes.*

* See "Proposed TaxoNo.mic Changes Since Listing for Two Maui Nui Plant Species."

We listed the bird *Pseudonestor xanthophrys* as an endangered species in 1967 (32 FR 4001; March 11, 1967). The common name for this endemic Hawaiian bird in 50 CFR 17.11 is Maui parrotbill. Recently, the Hawaiian Lexicon Committee proposed the Hawaiian name kiwikiu (meaning bent or curved as in the blade of a sickle, referring to the bird's strongly bent beak), and, while it has yet to be adopted by the American Ornithologists' Union, this name has been adopted by conservationists and Hawaiian language experts (Maui Forest Bird Recovery Project (MFBRP) 2010). We therefore propose to accept the following common names for this endangered bird: Maui parrotbill (Kiwikiu).

We listed the bird *Palmeria dolei* as an endangered species in 1967 (32 FR 4001; March 11, 1967). Currently, the common name listed for this endemic Hawaiian bird in 50 CFR 17.11 is crested honeycreeper. Although this bird's Hawaiian common name, akohekohe, was originally listed in 50 CFR 17.11 as well, at some point in time it was inadvertently deleted from the list of Endangered and Threatened Wildlife. We propose to reinsert the Hawaiian common name for this endangered bird, such that the common names will read: crested honeycreeper (Akohekohe).

We listed *Asplenium fragile* var. *insulare* as an endangered species in 1994 (59 FR 49025; September 26, 1994) following the taxonomic treatment of Morton (1947, pp. 116–117). However, we are currently following the more recent, widely used, and accepted *Hawaii's Ferns and Fern Allies* by Palmer (2003, pp. 70–71). Palmer placed *A. fragile* var. *insulare* in synonymy with *A. peruvianum* var. *insulare.* The recognized scientific name for this species is *A. peruvianum* var. *insulare.* The range of the species at the time of listing and now has not changed. Therefore, we propose to recognize the listed species as *Asplenium peruvianum* var. *insulare.*

At the time we listed *Centaurium sebaeoides* as an endangered species (56 FR 55770; October 29, 1991), we followed the taxonomic treatment in Wagner *et al.'s* (1990a, p. 725) widely used and accepted *Manual of the Flowering Plants of Hawaii.* However, in 2004, Mansion published a new classification of *Centaurium,* resurrecting the previously published combination *Schenkia sebaeoides* and placing *Centaurium sebaeoides* in synonymy with *S. sebaeoides* (Mansion 2004, pp. 724–726). The recognized scientific name for this species is *S. sebaeoides.* The range of the species at the time of listing and now has not changed. We therefore propose to recognize the listed species as *Schenkia sebaeoides.*

Cyanea dunbarii was misspelled in the final listing rule in 1996 (61 FR 53130; October 10, 1996), based on the misspelling of the specific epithet in the 1990 version of the *Manual of the Flowering Plants of Hawaii* (Lammers in Wagner *et al.* 1990, p. 448). The misspelling was corrected to *Cyanea dunbariae* in the 1999 version of the *Manual* (Lammers 1999, p. 448), and is recognized in the 2003 *Supplement* to the *Manual* (Wagner and Herbst 2003, p. 15) and in the Smithsonian Institution's *Flora of the Hawaiian Islands Database* (Wagner *et al.* 2005a). The recognized scientific name for this species is *Cyanea dunbariae.* The range of the species at the time of listing and now has not changed. Therefore, we propose to accept the spelling of the listed species as *Cyanea dunbariae.*

At the time we listed *Cyanea macrostegia* ssp. *gibsonii* as an endangered species (56 FR 47686; September 20, 1991), we followed Lammer's taxonomic treatment in Wagner *et al.'s* (1990, p. 456) widely used and accepted *Manual of the Flowering Plants of Hawaii.* Determinations made by Lammers on herbarium specimens at Hawaii's Bishop Museum Herbarium show he recognizes this species as *Cyanea gibsonii* (Imada 2011, in litt.) In addition, *C. gibsonii* is recognized and accepted in the Smithsonian Institution's *Flora of the Hawaiian Islands Database* (Wagner *et al.* 2005a). The range of the species at the time of listing and now has not changed. We propose to accept the listed species name as *Cyanea gibsonii.*

We listed *Diellia erecta* as an endangered species in 1994 (59 FR 56333; November 10, 1994), following Wagner (1952, pp. 10–13, 142–158), and Wagner and Wagner (1992, pp. 30–33). The name for this species has undergone several revisions, and it is currently recognized as *Asplenium dielerectum* (Viane and Reichstein 1991, p. 159; Schneider *et al.* 2005, p. 458; Smith *et al.* 2006, p. 715; Schuettpelz and Pryer 2007, p. 1,044). The range of the species at the time of listing and now has not changed. We propose to accept the listed species name as *Asplenium dielerectum.*

We listed *Hedyotis mannii* and *Hedyotis schlechtendahliana* var. *remyi* as endangered in 1992 and 1999, respectively (57 FR 46325, October 8, 1992; 64 FR 48307, September 3, 1999), following the taxonomic treatments in Wagner *et al.'s* (1999a, pp. 1,150–1,152) widely used and accepted *Manual of the*

Flowering Plants of Hawaii. In 2005, Terrell *et al.* (2005, pp. 818–819) resurrected the genus *Kadua* for all 21 native Hawaiian members of *Hedyotis,* as treated in Wagner *et al.* (1999a, pp. 1,133–1,156) and Wagner and Lorence (1998, p. 315–317), as well as 7 other Polynesian species, based on an analysis of fruit and corolla characters combined with seed shape and surface features determined by scanning electron microscopy. In their treatment, Terrell *et al.* (2005, pp. 818–819) synonymized *Hedyotis mannii* with *Kadua laxiflora* and *Hedyotis schlechtendahliana* var. *remyi* with *Kadua cordata* ssp. *remyi,* and these synonyms are accepted by Wagner *et al.* in the Smithsonian Institution's *Flora of the Hawaiian Islands Database* (2005a). The ranges of the two species at the time of listing and now have not changed; therefore we propose to accept the listed species names as *Kadua laxiflora* and *Kadua cordata* ssp. *remyi.*

We listed *Lipochaeta kamolensis* as an endangered species in 1992 (57 FR 20772; May 15, 1992) following the taxonomic treatment in Wagner *et al.*'s (1990a, p. 337) widely used and accepted *Manual of the Flowering Plants of Hawaii.* Wagner and Robinson (2001, pp. 539–561) transferred *L. kamolensis,* along with 13 other species of Hawaiian *Lipochaeta,* to *Melanthera* based on achene morphology and chromosome number, while retaining 6 of the Hawaiian species in *Lipochaeta. Lipochaeta kamolensis* is recognized as a synonym of *Melanthera kamolensis* by Wagner and Robinson (2001) and in the Smithsonian Institution's *Flora of the Hawaiian Islands Database* (Wagner *et al.* 2005a). The accepted scientific name for this species is *Melanthera kamolensis.* The range of the species at the time of listing and now has not changed; therefore we propose to accept the listed species name as *Melanthera kamolensis.*

At the time we listed *Mariscus fauriei* as an endangered species (59 FR 10305; March 4, 1994), we followed the taxonomic treatment by Koyama in Wagner *et al.*'s (1990, p. 1,417) widely used and accepted *Manual of the Flowering Plants of Hawaii.* Since then, Strong and Wagner (1997, p. 39) and, more recently, Wagner and Herbst (2003, pp. 52–53) moved all Hawaiian species of *Mariscus* to *Cyperus.* The accepted scientific name for this species is *Cyperus fauriei.* The range of the species at the time of listing and now has not changed. We therefore propose to accept the listed species name as *Cyperus fauriei.*

In 1992, we listed *Huperzia mannii* (57 FR 20772; May 15, 1992) and that listing was retained through 1996. However, in 1997, the List of Endangered and Threatened Plants at 50 CFR 17.12 indicated the species name as *Phlegmariurus mannii,* and in 2003, critical habitat was designated under the species name *Phlegmariurus mannii* (68 FR 25934; May 14, 2003). The List of Endangered and Threatened Plants at 50 CFR 17.12 currently has two entries: One for *Huperzia mannii,* which is out-of-date because it does not contain the critical habitat information for this plant, and one for *Phlegmariurus mannii,* which displays the current critical habitat information. We are currently following the widely used and accepted *Hawaii's Fern and Fern Allies* by Palmer (2003, p. 256), who recognizes this species as *Huperzia mannii,* following Ollgaard's *Index of the Lycopodiaceae* (1987, 135 pp.). The range of the species at the time of listing and now has not changed. Therefore, we propose to remove the entry for *Phlegmariurus mannii* and recognize the listed species as *Huperzia mannii.*

Proposed Taxonomic Changes Since Listing for Two Maui Nui Plant Species

At the time we listed *Cyanea grimesiana* ssp. *grimesiana* as endangered (61 FR 53108; October 10, 1996) we followed the taxonomic treatment of Lammers in Wagner *et al.* (1990, pp. 451–452). The distribution of *C. grimesiana* ssp. *grimesiana* as recognized at that time included the islands of Oahu, Molokai, Lanai, and Maui. Subsequently, Lammers (1998, pp. 31–32) recognized morphological differences in the broadly circumscribed *Cyanea grimesiana* group and published new combinations for the plants reported from Maui (*C. mauiensis*) and Lanai (*C. munroi*). Plants reported from Molokai were identified as either *C. munroi* or *C. grimesiana* ssp. *grimesiana.* In 2004, Lammers (pp. 85–87) recognized further differences in the plants reported from Maui and described a new species, *C. magnicalyx,* known only from west Maui. The range of *C. grimesiana* ssp. *grimesiana* now includes only Oahu and Molokai (Lammers 1998, pp. 31–32; Lammers 2004, pp. 84–85). Because the range of the listed entity has changed, in this proposed rule we evaluate the effects of the five factors described in section 4(a)(1) of the Act on *C. grimesiana* ssp. *grimesiana* as currently recognized to determine whether the species still warrants its status as endangered under the Act (see Summary of Factors Affecting the 40 Species Proposed or Reevaluated for Listing, below).

We listed *Santalum freycinetianum* var. *lanaiense* as endangered (51 FR 3182; January 24, 1986) in 1986. At that time the species was known only from the island of Lanai. Our recovery plan for this species, published in 1995, expanded the range to include west Maui, as well as Lanai, based on new information (USFWS 1995a, pp. 35–36). In her revision of the Hawaiian species of *Santalum,* Harbaugh *et al.* (2010, pp. 834–835) moved the plants previously recognized as *S. freycinetianum* var. *lanaiense* to *S. haleakalae* var. *lanaiense.* The range of *S. haleakalae* var. *lanaiense* now includes Molokai, Lanai, and east and west Maui (HBMP 2010; Harbaugh *et al.* 2010, pp. 834–835). Because the range of the listed entity has changed, in this proposed rule we evaluate the effects of the five factors described in section 4(a)(1) of the Act on *S. haleakalae* var. *lanaiense* as currently recognized to determine whether the species still warrants its status as endangered under the Act (see Summary of Factors Affecting the 40 Species Proposed or Reevaluated for Listing, below).

Proposed Delisting of Gahnia lanaiensis

Gahnia lanaiensis was listed as endangered in 1991 (56 FR 47686; September 20, 1991). At that time, this species was known from 15 or 16 large ''clumped'' plants growing on the summit of Lanaihale, on the island of Lanai. The distribution of these plants was considered to be the entire known range of the species. *Gahnia lanaiensis* was threatened due to the small number of individuals remaining and resulting negative consequences of very small populations which increased the potential for extinction of the species due to stochastic events; the potential for destruction of plants due their proximity to a popular hiking and jeep trail; and habitat degradation and destruction by feral ungulates and nonnative plants (56 FR 47686; September 20, 1991).

In a recently published paper, Koyama *et al.* (2010, pp. 29–30) found that based on spikelet and achene characters, *G. lanaiensis* is a complete match for *G. lacera,* a species endemic to New Zealand. Koyama further states that *G. lacera* likely arrived on Lanai, either intentionally or unintentionally, through the restoration efforts of George Munro, the Resident Manager of Lanai Ranch from 1911 to 1930 (Koyama 2010, p. 30). Born and raised in New Zealand, Munro is known to have used seeds of New Zealand's native plants for reforestation efforts on Lanai (Koyama 2010, p. 30).

Because *G. lanaiensis* is not believed to be a uniquely valid species; is synonymous with *G. lacera,* a species

endemic to New Zealand where it is known to be common (Piha New Zealand Plant Conservation Network 2010, in litt.); and is not in danger of extinction or likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range, we propose to delist *G. lanaiensis* due to error in the original listing.

An Ecosystem-Based Approach

On the islands of Molokai, Lanai, and Maui, as on most of the Hawaiian Islands, native species that occur in the same habitat types (ecosystems) depend on many of the same biological features and the successful functioning of that ecosystem to survive. We have therefore organized the species addressed in this proposed rule by common ecosystem. Although the listing determination for each species is analyzed separately, we have organized the individual analysis for each species within the context of the broader ecosystem in which it occurs to avoid redundancy. In addition, native species that share ecosystems often face a suite of common factors that may threaten them, and ameliorating or eliminating these threats for each individual species often requires the exact same management actions in the exact same areas. Effective management of these threats often requires implementation of conservation actions at the ecosystem scale to enhance or restore critical ecological processes and provide for long-term viability of those species in their native environment. Thus, by taking this approach, we hope to not only organize this proposed rule efficiently, but also to more effectively focus conservation management efforts on the common threats that occur across these ecosystems. Those efforts would facilitate restoration of ecosystem functionality for the recovery of each species, and provide conservation benefits for associated native species, thereby potentially precluding the need to list other species under the Act that occur in these shared ecosystems. In addition, this approach is in concordance with one of the primary stated purposes of the Act, as stated in section 2(b): ''To provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved.''

We propose to list *Bidens campylotheca* ssp. *pentamera, B. campylotheca* ssp. *waihoiensis, B. conjuncta, Calamagrostis hillebrandii, Cyanea asplenifolia, C. duvalliorum, C. horrida, C. kunthiana, C. magnicalyx, C. maritae, C. mauiensis, C. munroi, C. obtusa, C. profuga, C. solanacea, Cyrtandra ferripilosa, C. filipes, C. oxybapha, Festuca molokaiensis, Geranium hanaense, G. hillebrandii, Mucuna sloanei* var. *persericea, Myrsine vaccinioides, Peperomia subpetiolata, Phyllostegia bracteata, P. haliakalae, P. pilosa, Pittosporum halophilum, Pleomele fernaldii, Schiedea jacobii, S. laui, S. salicaria, Stenogyne kauaulaensis,* and *Wikstroemia villosa;* and *Newcombia cumingi, Partulina semicarinata* and *P. variabilis,* from the islands of Molokai, Lanai, and Maui as endangered species. We also propose to list *Canavalia pubescens,* known from the islands of Niihau, Kauai, Lanai, and Maui. In addition, we are reevaluating the listing of two plant species: *Santalum haleakalae* var. *lanaiense* from the islands of Molokai, Lanai, and Maui, and *Cyanea grimesiana* ssp. *grimesiana,* known from Oahu and Molokai, as endangered species. These 40 species (37 plants and 3 tree snails) are found in 10 ecosystem types: coastal, lowland dry, lowland mesic, lowland wet, montane dry, montane wet, montane mesic, subalpine, dry cliff, and wet cliff (Tables 2A, 2B, and 2C).

TABLE 2A—MOLOKAI: SPECIES PROPOSED OR REEVALUATED FOR LISTING AND THE ECOSYSTEMS UPON WHICH THEY DEPEND

Ecosystem	Species
Coastal	Plants: *Pittosporum halophilum.*
Lowland Mesic	Plants: *Cyanea profuga, Cyanea solanacea, Cyrtandra filipes, Festuca molokaiensis, Phyllostegia haliakalae, Phyllostegia pilosa, Santalum haleakalae* var. *lanaiense.*
Lowland Wet	Plants: *Cyanea grimesiana* ssp. *grimesiana, Cyanea solanacea, Cyrtandra filipes.*
Montane Mesic	Plants: *Cyanea solanacea, Santalum haleakalae* var. *lanaiense.*
Montane Wet	Plants: *Cyanea profuga, Cyanea solanacea, Phyllostegia pilosa, Schiedea laui.*
Wet Cliff	Plants: *Cyanea grimesiana* ssp. *grimesiana, Cyanea munroi.*

TABLE 2B—LANAI: SPECIES PROPOSED OR REEVALUATED FOR LISTING AND THE ECOSYSTEMS UPON WHICH THEY DEPEND

Ecosystem	Species
Coastal	Plants: *Canavalia pubescens.*
Lowland Dry	Plants: *Pleomele fernaldii.*
Lowland Mesic	Plants: *Pleomele fernaldii, Santalum haleakalae* var. *lanaiense.*
Lowland Wet	Plants: *Pleomele fernaldii, Santalum haleakalae* var. *lanaiense,* Animals: *Partulina semicarinata, Partulina variabilis.*
Montane Wet	Plants: *Santalum haleakalae* var. *lanaiense* Animals: *Partulina semicarinata, Partulina variabilis.*
Dry Cliff	Plants: *Phyllostegia haliakalae, Pleomele fernaldii.*
Wet Cliff	Plants: *Cyanea munroi, Phyllostegia haliakalae, Pleomele fernaldii, Santalum haleakalae* var. *lanaiense* Animals: *Partulina semicarinata, Partulina variabilis.*

TABLE 2C—MAUI: SPECIES PROPOSED OR REEVALUATED FOR LISTING AND THE ECOSYSTEMS UPON WHICH THEY DEPEND

Ecosystem	Species
Lowland Dry	Plants: *Bidens campylotheca* ssp. *pentamera, Canavalia pubescens, Cyanea obtusa, Santalum haleakalae* var. *lanaiense, Schiedea salicaria*.
Lowland Mesic	Plants: *Bidens campylotheca* ssp. *pentamera, Cyanea asplenifolia, C. mauiensis*, Santalum haleakalae* var. *lanaiense*.
Lowland Wet	Plants: *Bidens campylotheca* ssp. *waihoiensis, Bidens conjuncta, Cyanea asplenifolia, Cyanea duvalliorum, Cyanea kunthiana, Cyanea magnicalyx, Cyanea maritae, Cyrtandra filipes, Mucuna sloanei* var. *persericea, Phyllostegia bracteata, Santalum haleakalae* var. *lanaiense, Wikstroemia villosa*. Animals: *Newcombia cumingi*.
Montane Dry	Plants: *Santalum haleakalae* var. *lanaiense*.
Montane Mesic	Plants: *Bidens campylotheca* ssp. *pentamera, Cyanea horrida, Cyanea kunthiana, Cyanea magnicalyx, Cyanea obtusa, Cyrtandra ferripilosa, Cyrtandra oxybapha, Geranium hillebrandii, Phyllostegia bracteata, Santalum haleakalae* var. *lanaiense, Stenogyne kauaulaensis, Wikstroemia villosa*.
Montane Wet	Plants: *Bidens campylotheca* ssp. *pentamera, Bidens campylotheca* ssp. *waihoiensis, Bidens conjuncta, Calamagrostis hillebrandii, Cyanea duvalliorum, Cyanea horrida, Cyanea kunthiana, Cyanea maritae, Cyrtandra ferripilosa, Cyrtandra oxybapha, Geranium hanaense, Geranium hillebrandii, Myrsine vaccinioides, Peperomia subpetiolata, Phyllostegia bracteata, Phyllostegia pilosa, Schiedea jacobii, Wikstroemia villosa*.
Subalpine	Plants: *Phyllostegia bracteata*.
Dry Cliff	Plants: *Bidens campylotheca* ssp. *pentamera, Cyanea mauiensis.**
Wet Cliff	Plants: *Bidens campylotheca* ssp. *pentamera, Bidens campylotheca* ssp. *waihoiensis, Bidens conjuncta, Cyanea horrida, Cyanea magnicalyx, Cyrtandra filipes, Phyllostegia bracteata, Phyllostegia haliakalae, Santalum haleakalae* var. *lanaiense*.

* Not seen since the 1800s.

For each species, we identified and evaluated those factors that threaten the species and that may be common to all of the species at the ecosystem level. For example, the degradation of habitat by nonnative ungulates is considered a threat to 37 of the 40 species proposed or reevaluated for listing here, and is likely a threat to many, if not most or even all of the native species within a given ecosystem. We consider such a threat factor to be an ''ecosystem-level threat,'' as each individual species within that ecosystem faces a threat that is essentially identical in terms of the nature of the impact, its severity, its imminence, and its scope. Beyond ecosystem-level threats, we further identified and evaluated threat factors that may be unique to certain species, but do not apply to all species under consideration within the same ecosystem. For example, the threat of predation by nonnative snails is unique to the three tree snails in this proposed rule, and is not applicable to any of the other species proposed for listing. We have identified such threat factors, which apply only to certain species within the ecosystems addressed here, as ''species-specific threats.''

An Ecosystem-Based Approach to Determining Primary Constituent Elements of Critical Habitat

Under section 4(a)(3)(A) of the Act, we are required to designate critical habitat to the maximum extent prudent and determinable concurrently with the publication of a final determination that a species is endangered or threatened. In this proposed rule, we are proposing to designate critical habitat for 39 of 40 species on the islands of Molokai, Lanai, and Maui proposed here for listing as endangered. We are also proposing to designate critical habitat for 11 species that are already listed as endangered but for which critical habitat has not been previously proposed or designated. In addition, we are proposing to revise existing critical habitat for 85 listed plant species on the islands of Molokai, Lanai, Maui, and Kahoolawe. When critical habitat was designated for these Maui Nui plant species in 1984 (49 FR 44573; November 9, 1984) and 2003 (68 FR 1220, January 9, 2003; 68 FR 12982, March 18, 2003; 68 FR 25934, May 14, 2003), the areas designated were identified based primarily on where the species were known to occur at that time. We are proposing to revise critical habitat for these species because since then, we have learned that many native Hawaiian plants and animals currently persist only in areas of marginal habitat where the threats to the species are reduced under current conditions, but that these species can thrive when reintroduced into their historical habitats when threats are effectively managed there. For this reason, we believe it is important to designate habitat that may currently be unoccupied in cases where we have determined that habitat to be essential for the recovery of the species. In addition, because the prior designations focused only on discrete areas occupied by the species at the time of listing, the designations resulted in an overlapping and confusing patchwork of critical habitat areas for the many plant species that could be difficult for the public to interpret. As explained above, we believe that managing for the conservation of these multiple species on an ecosystem level will be a more efficient and effective use of resources to achieve the recovery of these species, as well as potentially preclude the need to list additional native species in the future. We believe this ecosystem-based approach will ultimately provide for greater public understanding of the conservation and recovery needs for each of the species addressed in this proposed rule.

In this proposed rule, we propose critical habitat for 135 species in 100 multiple-species critical habitat units. Although critical habitat is identified for each species individually, we have found that the conservation of each depends, at least in part, on the successful functioning of the physical or biological features of the commonly shared ecosystem. Each critical habitat unit identified in this proposed rule contains the physical or biological features essential to the conservation of those individual species that occupy that particular unit, or areas essential for the conservation of those species identified that do not presently occupy that particular unit. Where the unit is not occupied by a particular species, we believe it is still essential for the conservation of that species because the designation allows for the expansion of its range and reintroduction of individuals into areas where it occurred

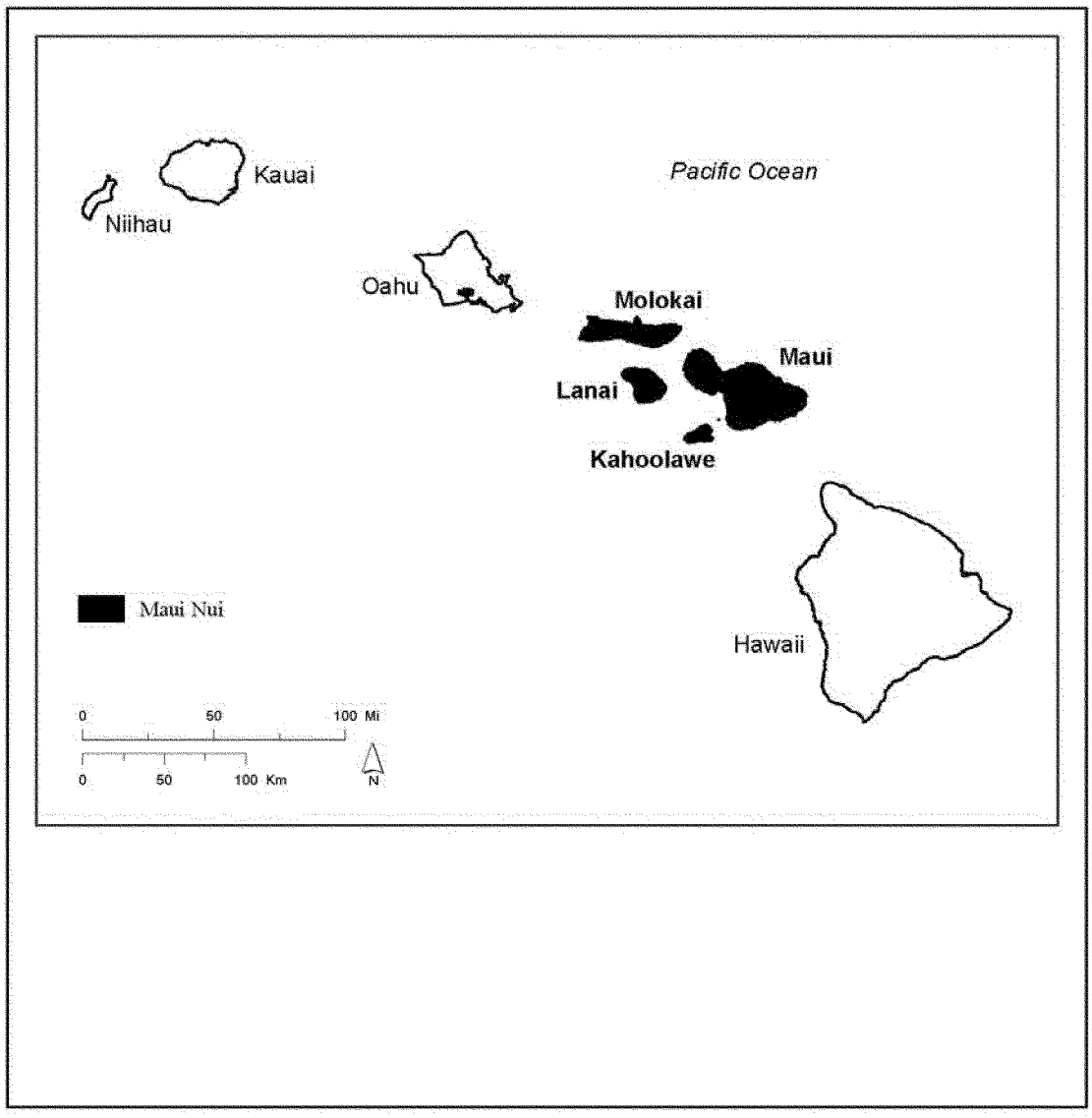
historically, and provides area for recovery in the case of stochastic events that otherwise hold the potential to eliminate the species from the one or more locations it is presently found. Under current conditions, many of these species are so rare in the wild that they are at high risk of extirpation or even extinction from various stochastic events, such as hurricanes or landslides. Therefore, building up resilience and redundancy in these species through the establishment of multiple, robust populations, is a key component of recovery.

Each of the areas proposed for designation represents critical habitat for multiple species, based upon their shared habitat requirements (i.e., physical or biological features) essential for their conservation. The identification of critical habitat also takes into account any species-specific conservation needs as appropriate. For example, the presence of a seasonally wet area within the coastal ecosystem is essential for the conservation of the plant *Marsilea villosa,* but is not a requirement shared by all of the other species within that same ecosystem; this would be an example of a species-specific requirement. However, a functioning ecosystem is also essential to *Marsilea villosa* because it provides the broader ''ecosystem-level'' physical or biological features that are required to support its specific life history requirements.

The Islands of Maui Nui

The islands of Maui Nui include Molokai, Lanai, Maui, and Kahoolawe (Figure 1). During the last Ice Age, about 21,000 years ago, when sea levels were approximately 459 feet (ft) (140 meters (m)) below their present level, these four islands were connected by a broad lowland plain and unified as a single island (Nullet *et al.* 1998, p. 64; Ziegler 2002, p. 22). This land bridge allowed the movement and interaction of each island's flora and fauna and contributed to the present close relationships of their biota (Nullet *et al.* 1998, p. 64).

Figure 1. Map of the Hawaiian Islands that collectively comprise Maui Nui.



The island of Molokai is the fifth largest of the eight main Hawaiian Islands. It was formed from three shield volcanoes and is about 260 square miles (sq mi) (673 square kilometers (sq km)) in area (Juvik and Juvik 1998, pp. 11, 13). The volcanoes that make up most of the land mass of Molokai include the west and east Molokai mountains, and a volcano that formed Kalaupapa peninsula. The taller and larger east Molokai mountain rises 4,970 ft (1,514 m) above sea level and comprises roughly 50 percent of the island's area (Juvik and Juvik 1998, p. 11). Topographically, the windward (north) side of east Molokai differs from the leeward (south) side. Precipitous cliffs line the windward coast and deep valleys dissect the coastal area. The annual rainfall on the windward side of Molokai is 75 to more than 150 inches (in) (200 to more than 375 centimeters (cm)) (Giambelluca and Schroeder 1998, p. 50).

The island of Lanai is the sixth largest of the eight main Hawaiian Islands, located southeast of Molokai and northwest of Hawaii Island. It is located in the lee or rain shadow of the taller west Maui mountains. Lanai was formed from a single shield volcano and built by eruptions at its summit and along three rift zones (Clague 1998, p. 42). The island is about 140 sq mi (364 sq km) in area and its highest point, Lanaihale, has an elevation of 3,366 ft (1,027 m) (Clague 1998, p. 42; Juvik and Juvik 1998, p. 13; Walker 1999, p. 21). Annual rainfall on the summit is 30 to 40 in (76 to 102 cm), but is considerably less, 10 to 20 in (25 to 50 cm), over much of the rest of the island (Giambelluca and Schroeder 1998, p. 56).

The island of Maui is the second largest of the eight main Hawaiian Islands, located southeast of Molokai and northwest of Hawaii Island (Juvik and Juvik 1998, p. 14). It was formed from two shield volcanoes and resulted in the west Maui mountains which are about 1.3 million years old and Haleakala on east Maui which is about 750,000 years old (Juvik and Juvik 1998, p. 14). West and east Maui are connected by the central Maui isthmus, and the island's total land area is 729 sq mi (1,888 sq km) (Juvik and Juvik 1998, p. 14; Walker 1999, p. 21). The west Maui mountains have been eroded by streams that created deep valleys and ridges. The highest point on west Maui is Puu Kukui at 5,788 ft (1,764 m) in elevation, and with an average rainfall of 400 in (1,020 cm) per year it is the second wettest spot in Hawaii (Juvik and Juvik 1998, p. 14; Wagner *et al.* 1999b, p. 41). East Maui's Haleakala volcano remains volcanically active, with its last eruption occurring only 200 years ago (Juvik and Juvik 1998, p. 14). Haleakala rises 10,023 ft (3,055 m) in elevation but lacks the diverse vegetation typical of the older and more eroded west Maui mountains. Rainfall on the slopes of Haleakala is about 35 in (89 cm) per year, with its windward (northeastern) slope receiving the most precipitation. However, Haleakala's crater is a dry cinder desert because it is above the level at which precipitation develops and is sheltered from moisture-laden winds usually associated with orographic (mountain) rainfall (Giambelluca and Schroeder 1998, p. 55).

The island of Kahoolawe is the smallest of the eight main Hawaiian Islands, located southeast of Molokai and northwest of Hawaii Island. The island is about 45 sq mi (116 sq km) in area, and was formed from a single shield volcano (Clague 1998, p. 42; Juvik and Juvik 1998, pp. 7, 16). The maximum elevation on Kahoolawe is 1,477 ft (450 m) at the summit of Puu Moaulanui (Juvik and Juvik 1998, pp. 15–16). Kahoolawe is in the rain shadow of Haleakala and is arid, receiving no more than 25 in (65 cm) of rainfall annually (Juvik and Juvik 1998, p. 16; Mitchell *et al.* 2005, pp. 6–66).

The vegetation of the islands of Maui Nui has undergone extreme alterations because of past and present land use and other activities. Land with rich soils was altered by the early Hawaiians and, more recently, converted to agricultural use in the production of sugar and pineapple (Gagne and Cuddihy 1999, p. 45) or pasture. For example, on Haleakala, on the island of Maui, the upland slopes have been converted to diversified agriculture and cattle ranches (Juvik and Juvik 1998, p. 16). Archaeological surveys suggest that the early Hawaiians did not live in the highest areas of Haleakala but instead inhabited the area temporarily for religious ceremonies, the creation of adzes (tools used for smoothing or carving wood), and bird hunting (Burney 1997, p. 448). Intentional and inadvertent introduction of alien plant and animal species has also contributed to the reduction in range of native vegetation on the islands of Maui Nui (throughout this rule, the terms ''alien,'' ''feral,'' ''nonnative,'' and ''introduced'' all refer to species that are not naturally native to the Hawaiian Islands). Currently, most of the native vegetation on the islands persists on upper elevation slopes, valleys and ridges; steep slopes; precipitous cliffs; valley headwalls; and other regions where unsuitable topography has prevented urbanization and agricultural development, or where inaccessibility has limited encroachment by nonnative plant and animal species.

Maui Nui Ecosystems

There are 11 different ecosystems (coastal, lowland dry, lowland mesic, lowland wet, montane dry, montane mesic, montane wet, subalpine, alpine, dry cliff, and wet cliff) recognized on the islands of Maui Nui. The 40 species proposed for listing occur in 10 of these ecosystems (all except the alpine), which collectively support the 135 species for which critical habitat is proposed. All 11 Maui Nui ecosystems are described in the following section; see Table 4 (in ''Physical or Biological Features,'' below) for a list of the species that occur in each ecosystem type.

Coastal

The coastal ecosystem is found on all of the main Hawaiian Islands, with the highest native species diversity in the least populated coastal areas of Kauai, Oahu, Molokai, Maui, Kahoolawe, Hawaii Island, and their associated islets. On Molokai, Lanai, Maui, and Kahoolawe, the coastal ecosystem includes mixed herblands, shrublands, and grasslands, from sea level to 980 ft (300 m) in elevation, generally within a narrow zone above the influence of waves to within 330 ft (100 m) inland, sometimes extending further inland if strong prevailing onshore winds drive sea spray and sand dunes into the lowland zone (The Nature Conservancy (TNC) 2006a). The coastal ecosystem is typically dry, with annual rainfall of less than 20 in (50 cm); however, windward rainfall may be high enough (up to 40 in (100 cm)) to support mesic-associated and sometimes wet-associated vegetation (Gagne and Cuddihy 1999, pp. 54–66). Biological diversity is low to moderate in this ecosystem, but may include some specialized plants and animals such as nesting seabirds and the endangered plant *Sesbania tomentosa* (ohai) (TNC 2006a). The plants *Canavalia pubescens* and *Pittosporum halophilum,* which are proposed for listing as endangered in this rule, are reported in this ecosystem on Molokai and Lanai (Hawaii Biodiversity and Mapping Program (HBMP) 2008; TNC 2007).

Lowland Dry

The lowland dry ecosystem includes shrublands and forests generally below 3,300 ft (1,000 m) elevation that receive less than 50 in (130 cm) annual rainfall, or are in otherwise prevailingly dry substrate conditions that range from weathered reddish silty loams to stony clay soils, rocky ledges with very

shallow soil, or relatively recent little-weathered lava (Gagne and Cuddihy 1999, p. 67). Areas consisting of predominantly native species in the lowland dry ecosystem are now rare; this ecosystem is found on the islands of Kauai, Oahu, Molokai, Lanai, Maui, Kahoolawe and Hawaii, and is best represented on the leeward sides of the islands (Gagne and Cuddihy 1999, p. 67). On the islands of Maui Nui, this ecosystem is typically found on the leeward side of the mountains (Gagne and Cuddihy 1999, p. 67; TNC 2006b). Native biological diversity is low to moderate in this ecosystem, and includes specialized animals and plants such as the Hawaiian owl or pueo (*Asio flammeus sandwichensis*) and *Santalum ellipticum* (iliahialoe or coast sandalwood) (Wagner *et al.* 1999c, pp. 1,220–1,221; TNC 2006b). The plants *Bidens campylotheca* ssp. *pentamera, Canavalia pubescens, Cyanea obtusa, Santalum haleakalae* var. *lanaiense, Pleomele fernaldii,* and *Schiedea salicaria,* which are proposed or reevaluated for listing as endangered in this rule, are reported from this ecosystem on Lanai and Maui (HBMP 2008; TNC 2007).

Lowland Mesic

The lowland mesic ecosystem includes a variety of grasslands, shrublands, and forests, generally below 3,300 ft (1,000 m) elevation, that receive between 50 and 75 in (130 and 190 cm) annual rainfall (TNC 2006c). In the Hawaiian Islands, this ecosystem is found on Kauai, Molokai, Lanai, Maui, and Hawaii, on both windward and leeward sides of the islands. On the islands of Maui Nui, this ecosystem is typically found on the leeward slopes of Molokai, Lanai, and Maui (Gagne and Cuddihy 1999, p. 75; TNC 2006c). Native biological diversity is high in this system (TNC 2006c). The plants *Bidens campylotheca* ssp. *pentamera, Cyanea asplenifolia, C. profuga, C. solanacea, Cyrtandra filipes, Festuca molokaiensis, Phyllostegia haliakalae, P. pilosa, Pleomele fernaldii,* and *Santalum haleakalae* var. *lanaiense,* which are proposed or reevaluated for listing as endangered in this rule, are reported in this ecosystem on this islands of Molokai, Lanai, and Maui (HBMP 2008; TNC 2007). In addition, *Cyanea mauiensis,* a species proposed for listing, may have occurred in this ecosystem on Maui but this species has not been observed for over 100 years. The species-specific habitat needs of *Cyanea mauiensis* are not known.

Lowland Wet

The lowland wet ecosystem is generally found below 3,300 ft (1,000 m) elevation on the windward sides of the main Hawaiian Islands, except Niihau and Kahoolawe (Gagne and Cuddihy 1999, p. 85; TNC 2006d). These areas include a variety of wet grasslands, shrublands, and forests that receive greater than 75 in (190 cm) annual precipitation, or are in otherwise wet substrate conditions (TNC 2006d). On the islands of Maui Nui, this system is best developed in wet valleys and slopes on Molokai, Lanai, and Maui (TNC 2006d). Native biological diversity is high in this system (TNC 2006d). The plants *Bidens campylotheca* ssp. *waihoiensis, B. conjuncta, Cyanea asplenifolia, C. duvalliorum, C. grimesiana* ssp. *grimesiana, C. kunthiana, C. magnicalyx, C. maritae, C. solanacea, Cyrtandra filipes, Mucuna sloanei* var. *persericea, Phyllostegia bracteata, Santalum haleakalae* var. *lanaiense, Pleomele fernaldii,* and *Wikstroemia villosa;* and the tree snails *Newcombia cumingi, Partulina semicarinata,* and *P. variabilis,* which are proposed or reevaluated for listing as endangered in this rule, are reported in this ecosystem on Molokai, Lanai, and Maui (HBMP 2008; TNC 2007).

Montane Wet

The montane wet ecosystem is composed of natural communities (grasslands, shrublands, forests, and bogs) found at elevations between 3,300 and 6,500 ft (1,000 and 2,000 m), in areas where annual precipitation is greater than 75 in (190 cm) (TNC 2006e). This system is found on all of the main Hawaiian Islands except Niihau and Kahoolawe, and only the islands of Molokai, Maui, and Hawaii have areas above 4,020 ft (1,225 m) (TNC 2006e). On the islands of Maui Nui this ecosystem is found on Molokai, Lanai, and Maui (TNC 2007). Native biological diversity is moderate to high (TNC 2006e). The plants *Bidens campylotheca* ssp. *pentamera, B. campylotheca* ssp. *waihoiensis, B. conjuncta, Calamagrostis hillebrandii, Cyanea duvalliorum, C. horrida, C. kunthiana, C. maritae, C. profuga, C. solanacea, Cyrtandra ferripilosa, C. oxybapha, Geranium hanaense, G. hillebrandii, Myrsine vaccinioides, Peperomia subpetiolata, Phyllostegia bracteata, P. pilosa, Santalum haleakalae* var. *lanaiense, Schiedea jacobii, S. laui, and Wikstroemia villosa;* and the tree snails *Partulina semicarinata* and *P. variabilis,* which are proposed or reevaluated for listing as endangered in this rule, are reported in this ecosystem on the islands of Molokai, Lanai, and Maui (HBMP 2008; TNC 2007).

Montane Mesic

The montane mesic ecosystem is composed of natural communities (forests and shrublands) found at elevations between 3,300 and 6,500 ft (1,000 and 2,000 m), in areas where annual precipitation is between 50 and 75 in (130 and 190 cm), or are in otherwise mesic substrate conditions (TNC 2006f). This system is found on Kauai, Molokai, Maui, and Hawaii Island (Gagne and Cuddihy 1999, pp. 97–99; TNC 2007). Native biological diversity is moderate, and this habitat is important for Hawaiian forest birds (Gagne and Cuddihy 1999, pp. 98–99; TNC 2006f). The plants *Bidens campylotheca* ssp. *pentamera, Cyanea horrida, C. kunthiana, C. magnicalyx, C. obtusa, C. solanacea, Cyrtandra ferripilosa, C. oxybapha, Geranium hillebrandii, Phyllostegia bracteata, Santalum haleakalae* var. *lanaiense, Stenogyne kauaulaensis,* and *Wikstroemia villosa,* which are proposed or reevaluated for listing as endangered in this rule, are reported in this ecosystem on Molokai and Maui (TNC 2007; HBMP 2008).

Montane Dry

The montane dry ecosystem is composed of natural communities (shrublands, grasslands, forests) found at elevations between 3,300 and 6,500 ft (1,000 and 2,000 m), in areas where annual precipitation is less than 50 in (130 cm), or are in otherwise dry substrate conditions (TNC 2006g). This system is found on the islands of Maui and Hawaii (Gagne and Cuddihy 1999, pp. 93–97). The only plant species reevaluated for listing found in this ecosystem is *Santalum haleakalae* var. *lanaiense* (TNC 2007; HBMP 2008).

Subalpine

The subalpine ecosystem is composed of natural communities (shrublands, grasslands, forests) found at elevations between 6,500 ft and 9,800 ft (2,000 and 3,000 m), in areas where annual precipitation is seasonal, between 15 and 40 in (38 and 100 cm), or are in otherwise dry substrate conditions (TNC 2006h). Fog drip is an important moisture supplement (Gagne and Cuddihy 1999, pp. 107–110). This system is found on the islands of Maui and Hawaii (Gagne and Cuddihy 1999, pp. 107–110). Native biological diversity is not high, but specialized invertebrates and plants (*Sophora chrysophylla* (mamane), *Myoporum sandwicense* (naio), and *Deschampsia nubigena* (hairgrass)) are reported in this

ecosystem (TNC 2006h). The plant *Phyllostegia bracteata,* which is proposed as endangered in this rule, is reported in this ecosystem (TNC 2007; HBMP 2008).

Alpine

The alpine ecosystem is composed of natural communities (shrublands, alpine lake, aeolian (wind-shaped) desert) found at elevations above 9,800 ft (3000 m), in areas where annual precipitation is infrequent, with frost and snow, and intense solar radiation (TNC 2006i). Fog drip is an important moisture supplement (Gagne and Cuddihy 1999, pp. 107–110). This system is found on the islands of Maui and Hawaii (Gagne and Cuddihy 1999, pp. 107–110). Native biological diversity is not high, but highly specialized plants, such as the threatened *Argyroxiphium sandwicense* ssp. *macrocephalum* (ahinahina), occur in this ecosystem on Maui (TNC 2006i). None of the species proposed or reevaluated for listing in this rule are reported from this ecosystem (TNC 2007; HBMP 2008).

Dry Cliff

The dry cliff ecosystem is composed of vegetation communities occupying steep slopes (greater than 65 degrees) in areas that receive less than 75 in (190 cm) of rainfall annually, or are in otherwise dry substrate conditions (TNC 2006j). This ecosystem is found on all of the main Hawaiian Islands except Niihau, and is best represented along the leeward slopes of Lanai and Maui (TNC 2006j). A variety of shrublands occur within this ecosystem (TNC 2006j). Native biological diversity is low to moderate (TNC 2006j). The plants *Bidens campylotheca* ssp. *pentamera, Phyllostegia haliakalae,* and *Pleomele fernaldii,* which are proposed as endangered in this rule, are reported in this ecosystem on Lanai and Maui (HBMP 2008; TNC 2007).

Wet Cliff

The wet cliff ecosystem is generally composed of shrublands on near-vertical slopes (greater than 65 degrees) in areas that receive more than 75 in (190 cm) of annual precipitation, or in otherwise wet substrate conditions (TNC 2006k). This system is found on the islands of Kauai, Oahu, Molokai, Lanai, Maui, and Hawaii. On the islands of Maui Nui, this system is typically found along the windward sides of Molokai, Lanai, and Maui (TNC 2006k). Native biological diversity is low to moderate (TNC 2006k). The plants *Bidens campylotheca* ssp. *pentamera, B. campylotheca* ssp. *waihoiensis, B. conjuncta, Cyanea grimesiana* ssp. *grimesiana, C.horrida, C. magnicalyx, C. munroi, Cyrtandra filipes, Phyllostegia bracteata, P. haliakalae, Santalum haleakalae* var. *lanaiense, and Pleomele fernaldii;* and the tree snails *Partulina semicarinata* and *P. variabilis,* which are proposed or reevaluated for listing as endangered in this rule, are reported in this ecosystem on the islands of Molokai, Lanai, and Maui (HBMP 2008; TNC 2007).

Description of the 40 Species Proposed or Reevaluated for Listing

Below is a brief description of each of the 40 species proposed or reevaluated for listing, presented in alphabetical order by genus. Plants are presented first, followed by animals.

Plants

In order to avoid confusion regarding the number of locations of each species (a location does not necessarily represent a viable population, as in some cases there may only be one or a very few representatives of the species present) we use the word ''occurrence'' instead of ''population.'' Each occurrence is composed only of wild (i.e., not propagated and outplanted) individuals.

Bidens campylotheca ssp. *pentamera* (kookoolau), a perennial herb in the sunflower family (Asteraceae), occurs only on the island of Maui (Ganders and Nagata 1999, pp. 271, 273). Historically, *B. campylotheca* spp. *pentamera* was found on Maui's eastern volcano (i.e., Haleakala). Currently, this subspecies is found on east Maui in the montane mesic, montane wet, dry cliff, and wet cliff ecosystems of Waikamoi Preserve and Kipahulu Valley (in Haleakala National Park) (TNC 2007; HBMP 2008; Welton 2008, in litt.; National Tropical Botanical Garden (NTBGa) 2009, pp. 1–2; Fay 2010, in litt.). It is uncertain if plants observed in the Hana Forest Reserve at Waihoi Valley are *Bidens campylotheca* ssp. *pentamera* (Osterneck 2010, in litt.). On west Maui, *B. campylotheca* ssp. *pentamera* is found on and near cliff walls in the lowland dry and lowland mesic ecosystems of Papalaua Gulch (West Maui Forest Reserve) and Kauaula Valley (NTBG 2009a, pp. 1–2; Perlman 2009a, in litt.). The 6 occurrences on east and west Maui total approximately 200 individuals.

Bidens campylotheca ssp. *waihoiensis* (kookoolau), a perennial herb in the sunflower family (Asteraceae), occurs only on the island of Maui (Ganders and Nagata 1999, pp. 271, 273). Historically, *B. campylotheca* ssp. *waihoiensis* was found on Maui's eastern volcano in Waihoi Valley and Kaumakani ridge (HBMP 2008). Currently, this subspecies is found in the lowland wet, montane wet, and wet cliff ecosystems in Kipahulu Valley (Haleakala National Park) and possibly in Waihoi Valley (Hana Forest Reserve) on east Maui (TNC 2007; HBMP 2008; Welton 2008, in litt.). Approximately 200 plants are scattered over an area of about 2.5 miles (4 km) in Kipahulu Valley (Welton 2010a, in litt.). In 1974, hundreds of individuals were observed in Waihoi Valley along Waiohonu stream (NTBG 2009b, p. 4).

Bidens conjuncta (kookoolau), a perennial herb in the sunflower family (Asteraceae), occurs only on the island of Maui (Ganders and Nagata 1999, pp. 273–274). Historically, this species was known only from the mountains of west Maui in the Honokohau drainage basin (Sherff 1923, p. 162). Currently, *B. conjuncta* is found scattered throughout the upper elevation drainages of the west Maui mountains in the lowland wet, montane wet, and wet cliff ecosystems, in 9 occurrences totaling an estimated 7,000 individuals (TNC 2007; HBMP 2008; Oppenheimer 2008a, in litt.; Perlman 2010, in litt.).

Calamagrostis hillebrandii (NCN), a perennial in the grass family (Poaceae), occurs only on the island of Maui (O'Connor 1999, p. 1,509). Historically, this species was known from Puu Kukui in the west Maui mountains (Wagner *et al.* 2005a—*Flora of the Hawaiian Islands database*). Currently, this species is found in bogs in the montane wet ecosystem in the west Maui mountains, from Honokohau to Kahoolewa ridge, including East Bog and Eke Crater, in three occurrences totaling a few hundred individuals (TNC 2007; HBMP 2008; Oppenheimer 2010a, in litt.).

Canavalia pubescens (awikiwiki), a perennial climber in the pea family (Fabaceae), is currently found only on the island of Maui, although it was also historically known from Niihau, Kauai, and Lanai (Wagner and Herbst 1999, p. 654). On Niihau, this species was known from one population in Haao Valley that was last observed in 1949 (HBMP 2008). On Kauai, this species was known from six populations ranging from Awaawapuhi to Wainiha, where it was last observed in 1977 (HBMP 2008). On Lanai, this species was known from Kaena Point to Huawai Bay. Eight individuals were reported in the coastal ecosystem west of Hulupoe, but they have not been seen since 1998 (Oppenheimer 2007a, in litt.; HBMP 2008). At present, the only known occurrence is on east Maui, from Puu o Kali south to Pohakea, in the lowland

dry ecosystem (Starr 2006, in litt.; Altenburg 2007, pp. 12–13; Oppenheimer 2006a, in litt.; 2007a, in litt.). All plants of this species that formerly were found in the Ahihi-Kinau Natural Area Reserve on Maui were destroyed by feral goats (*Capra hircus*) by the end of 2010 (Fell-McDonald 2010, in litt.). In April of 2010, *C. pubescens* totaled as many as 500 individuals; however, with the recent loss of the plants at Ahihi-Kinau Natural Area Reserve, *C. pubescens* may currently total fewer than 200 individuals at a single location.

Cyanea asplenifolia (HAHA), a shrub in the bellflower family (Campanulaceae), is found only on the island of Maui. This species was known historically from Waihee Valley and Kaanapali on west Maui, and Halehaku ridge on east Maui (Lammers 1999, p. 445; HBMP 2008). On west Maui, in the lowland wet ecosystem, there are 3 occurrences totaling 14 individuals in the Puu Kukui Preserve and two occurrences totaling 5 individuals in the West Maui Natural Area Reserve. On east Maui, *C. asplenifolia* is found in 1 occurrence each in the lowland mesic ecosystem in Haleakala National Park (53 individuals) and Kipahulu FR (140 individuals), and 1 occurrence in the lowland wet ecosystem in the Makawao FR (5 individuals) (TNC 2007; HBMP 2008; Oppenheimer 2008b, in litt, 2010b, in litt.; PEPP 2008, p. 48; Welton and Haus 2008, p. 12; NTBG 2009c, pp. 3–5; Welton 2010a, in litt.). Currently, *C. asplenifolia* is known from 8 occurrences totaling fewer than 200 individuals.

Cyanea duvalliorum (HAHA), a tree in the bellflower family (Campanulaceae), is found only in the east Maui mountains (Lammers 2004, p. 89). This species was described in 2004, after the discovery of individuals of a previously unknown species of *Cyanea* at Waiohiwi Gulch (Lammers 2004, p. 91). Studies of earlier collections of sterile material extend the historical range of this species on the windward slopes of Haleakala in the lowland wet and montane wet ecosystems, east of Waiohiwi Stream, from Honomanu Stream to Wailua Iki Streams, and to Kipahulu Valley (Lammers 2004, p. 89). In 2007, one individual was observed in the lowland wet ecosystem of the Makawao FR (NTBG 2009d, p. 2). In 2008, 71 individuals were found in 2 new locations in the Makawao FR, along with many juveniles and seedlings (NTBG 2009d, p. 2). Currently there are 2 occurrences with an approximate total of 71 individuals in the montane wet ecosystem near Makawao FR, with an additional 135 individuals outplanted in Waikamoi Preserve (TNC 2007; NTBG 2009d, p. 2; Oppenheimer 2010a, in litt.).

Cyanea grimesiana ssp. *grimesiana* (HAHA), a shrub in the bellflower family (Campanulaceae), is known only from Oahu and Molokai (Lammers 2004 p. 84; Lammers 1999, pp. 449, 451; 68 FR 35950, June 17, 2003). On Molokai, this species was last observed in 1991 in the wet cliff ecosystem at Wailau Valley (PEPP 2010, p. 45). Currently, on Oahu there are five to six individuals in four occurrences in the Waianae and Koolau Mountains (U.S. Army 2006; HBMP 2008).

Cyanea horrida (haha nui), a member of the bellflower family (Campanulaceae), is a palm-like tree found only on the island of Maui. This species was known historically from the slopes of Haleakala (Lammers 1999, p. 453; HBMP 2008). Currently, *C. horrida* is known from 12 occurrences totaling 44 individuals in the montane mesic, montane wet, and wet cliff ecosystems in Waikamoi Preserve, Hanawai Natural Area Reserve, and Haleakala National Park on east Maui (TNC 2007; HBMP 2008; PEPP 2009, p. 52; PEPP 2010, p. 46–47; Oppenheimer 2010c, in litt.; TNCH 2010a, p. 1).

Cyanea kunthiana (HAHA), a shrub in the bellflower family (Campanulaceae), is found only on Maui, and was historically known from both the east and west Maui mountains (Lammers 1999, p. 453; HBMP 2008). *Cyanea kunthiana* was known to occur in the montane mesic ecosystem in the east Maui mountains in upper Kipahulu Valley, in Haleakala National Park and Kipahulu FR (HBMP 2008). Currently, in the east Maui mountains, *C. kunthiana* occurs in the lowland wet and montane wet ecosystems in Waikamoi Preserve, Hanawi Natural Area Reserve, East Bog, Kaapahu, and Kipahulu Valley. In the west Maui mountains, *C. kunthiana* occurs in the lowland wet and montane wet ecosystems at Eke Crater, Kahoolewa ridge, and at the junction of the Honokowai, Hahakea, and Honokohau gulches (TNC 2007; HBMP 2008; NTBG 2009e, pp. 1–3; Perlman 2010, in litt.; Oppenheimer 2010a, in litt.). The 15 occurrences total 165 individuals, although botanists speculate that this species may total as many as 400 individuals with further surveys of potential habitat on east and west Maui (TNC 2007; HBMP 2008; Fay 2010, in litt.; Oppenheimer 2010a, in litt.; Osternak 2010, in litt.).

Cyanea magnicalyx (HAHA), a perennial shrub in the bellflower family (Campanulaceae), is known from west Maui (Lammers 1999, pp. 449, 451; Lammers 2004, p. 84). Currently, there are seven individuals in three occurrences on west Maui: Two individuals in Kaluanui, a subgulch of Honokohau Valley, in the lowland wet ecosystem; four individuals in Iao Valley in the wet cliff ecosystem; and one individual in a small drainage south of the Kauaula rim, in the montane mesic ecosystem (Lammers 2004, p. 87; Perlman 2009b in litt.; Wood 2009, in litt.).

Cyanea maritae (HAHA), a shrub in the bellflower family (Campanulaceae), is found only on Maui (Lammers 2004, p. 92). Sterile specimens were collected from the northwestern slopes of Haleakala in the Waiohiwi watershed and east to Kipahulu in the early 1900s. Between 2000 and 2002, fewer than 20 individuals were found in the Waiohiwi area (Lammers 2004, pp. 92, 93). Currently, there are 4 occurrences, totaling between 23 to 50 individuals in Kipahulu, Kaapahu, west Kahakapao, and in the Koolau FR in the lowland wet and montane wet ecosystems on east Maui (TNC 2007; Oppenheimer 2010b, in litt.; Welton 2010b, in litt.).

Cyanea mauiensis (HAHA), a perennial shrub in the bellflower family (Campanulaceae), was last observed on Maui about 100 years ago (Lammers 2004, pp. 84–85; TNC 2007). Although there are no documented occurrences of this species known today, botanists believe this species may still be extant as all potentially suitable lowland mesic and dry cliff habitat has not been been surveyed.

Cyanea munroi (HAHA), a short-lived shrub in the bellflower family (Campanulaceae), is known from Molokai and Lanai (Lammers 1999, pp. 449, 451; Lammers 2004, pp. 84–87). Currently, there are no known individuals on Molokai (last observed in 2001), and only two individuals on Lanai at a single location, in the wet cliff ecosystem (TNC 2007; HBMP 2008; Oppenheimer 2010d, in litt.; Perlman 2008a, in litt.; Wood 2009a, in litt.).

Cyanea obtusa (HAHA), a shrub in the bellflower family (Campanulaceae), is found only on Maui (Lammers 1999, p. 458). Historically, this species was found in both the east and west Maui mountains (Hillebrand 1888, p. 254; HBMP 2008). Not reported since 1919 (Lammers 1999, p. 458), *C. obtusa* was rediscovered in the early 1980s at one site each on east and west Maui. However, by 1989, plants in both locations had disappeared (Hobdy *et al.* 1991, p. 3; Medeiros 1996, in litt.). In 1997, 4 individuals were observed in Manawainui Gulch in Kahikinui, and another occurrence of 5 to 10

individuals was found in Kahakapao Gulch, both in the montane mesic ecosystem on east Maui (Wood and Perlman 1997, p. 11; Lau 2001, in litt.). However, the individuals found at Kahakapao Gulch are now considered to be *Cyanea elliptica* or hybrids between *C. obtusa* and *C. elliptica* (PEPP 2007, p. 40). In 2001, several individuals were seen in Hanaula and Pohakea gulches on west Maui; however, only hybrids are currently known in this area (NTBG 2009f, p. 3). It is unknown if individuals of *C. obtusa* remain at Kahikinui, as access to the area to ascertain the status of these plants is difficult and has not been attempted since 2001 (PEPP 2008, p. 55; PEPP 2009, p. 58). Two individuals were observed on a cliff along Wailaulau Stream in the montane mesic ecosystem on east Maui in 2009 (Duvall 2010, in litt.). Currently, this species is known from one occurrence of only a few individuals in the montane mesic ecosystem on east Maui. Historically, this species also occurred in the lowland dry ecosystem at Manawainui on west Maui and at Ulupalakua on east Maui (HBMP 2008).

Cyanea profuga (HAHA), a shrub in the bellflower family (Campanulaceae), occurs only on Molokai (Lammers 1999, pp. 461–462; Wood and Perlman 2002, p. 4). Historically, this species was found in Mapulehu Valley and along Pelekunu Trail, and has not been seen in those locations since the early 1900s (Wood and Perlman 2002, p. 4). In 2002, six individuals were discovered along a stream in Wawaia Gulch (Wood and Perlman 2002, p. 4). In 2007, seven individuals were known from Wawaia Gulch, and an additional six individuals were found in Kumueli (Wood 2005, p. 17; USFWS 2007a; PEPP 2010, p. 55). In 2009, only four individuals remained at Wawaia Gulch; however, nine were found in Kumueli Gulch (Bakutis 2010, in litt.; Oppenheimer 2010e, in litt.; Perlman 2010, in litt.; PEPP 2010, p. 55). Currently, there are 4 occurrences totaling up to 34 individuals in the lowland mesic and montane wet ecosystems on Molokai (TNC 2007; Bakutis 2010, in litt.; Perlman 2010, in litt.).

Cyanea solanacea (popolo, haha nui), a shrub in the bellflower family (Campanulaceae), is found only on Molokai. According to Lammers (1999, p. 464) and Wagner (*et al.* 2005a—*Flora of the Hawaiian Islands database*) the range of *C. solanacea* includes Molokai and may also include west Maui. In his treatment of the species of the Hawaiian endemic genus *Cyanea,* Lammers (1999, p. 464) included a few sterile specimens of *Cyanea* from Puu Kukui, west Maui and the type specimen (now destroyed) for *C. scabra* var. *sinuata* from west Maui in *C. solanacea.* However, Oppenheimer recently reported (Oppenheimer 2010a, in litt.) that the plants on west Maui were misidentified as *C. solanacea* and are actually *C. macrostegia.* Based on Oppenheimer's recent field observations, the range of *C. solanacea* is limited to Molokai. Historically, *Cyanea solanacea* ranged from central Molokai at Kalae, eastward to Pukoo in the lowland mesic, lowland wet, and montane mesic ecosystems (HBMP 2008). Currently, there are four small occurrences at Hanalilolilo, near Pepeopae Bog, Kaunakakai Gulch, and Kawela Gulch, in the montane wet ecosystem. These occurrences total 26 individuals (Bakutis 2010, in litt.; Oppenheimer 2010a, in litt.; TNCH 2011, pp. 21, 57).

Cyrtandra ferripilosa (haiwale), a shrub in the African violet family (Gesneriaceae), occurs only on Maui (St. John 1987, pp. 497–498; Wagner and Herbst 2003, p. 29). This species was discovered in 1980 in the east Maui mountains at Kuiki in Kipahulu Valley (St. John 1987, pp. 497–498; Wagner *et al.* 2005a—*Flora of the Hawaiian Islands database*). Currently, there are a few individuals each in two occurrences at Kuiki and on the Manawainui plane in the montane mesic and montane wet ecosystems (Oppenheimer 2010f, in litt.; Welton 2010a, in litt.).

Cyrtandra filipes (haiwale), a shrub in the African violet family (Gesneriaceae), is found on Maui (Wagner *et al.* 1999d, pp. 753–754; Oppenheimer 2006b, in litt.). According to Wagner *et al.* (1999d, p. 754), the range of *C. filipes* includes Maui and Molokai. Historical collections from Kapunakea (1800) and Olowalu (1971) on Maui indicate it once had a wider range on this island. In 2004, it was believed there were over 2,000 plants at Honokohau and Waihee in the west Maui mountains; however, recent studies have shown that these plants do not match the description for *C. filipes* (Oppenheimer 2006b, in litt.). Currently, there are between 134 and 155 individuals in 4 occurrences in the lowland wet and wet cliff ecosystems at Kapalaoa, Honokowai, Honolua, and Waihee Valley on west Maui, and approximately 7 individuals at Mapulehu in the lowland mesic ecosystem on Molokai, with an historical occurrence in the lowland wet ecosystem (Oppenheimer 2010c, in litt.).

Cyrtandra oxybapha (haiwale), a shrub in the African violet family (Gesneriaceae), is found on Maui (Wagner *et al.* 1999d, p. 771). This species was discovered in the upper Pohakea Gulch in Hanaula in the west Maui mountains in 1986 (Wagner *et al.* 1989, p. 100; TNC 2007). Currently, there are 2 known occurrences with a total of 137 to 250 individuals. *Cyrtandra oxybapha* occurs in the montane wet ecosystem on west Maui, from Hanaula to Pohakea Gulch. This occurrence totals between 87 and 97 known individuals, with perhaps as many as 150 or more (Oppenheimer 2008c, in litt.). The current status of the 50 to 100 individuals in the montane mesic ecosystem in Manawainui Gulch on east Maui is unknown, as these plants have not been surveyed since 1997 (Oppenheimer 2010a, in litt.).

Festuca molokaiensis (NCN), a member of the grass family (Poaceae), is found on Molokai (Catalan *et al.* 2009, p. 54). This species is only known from the type locality at Kupaia Gulch, in the lowland mesic ecosystem (Catalan *et al.* 2009, p. 55). Last seen in 2009, the current number of individuals is unknown; however, field surveys for *F. molokaiensis* at Kupaia Gulch are planned for 2011 (Oppenheimer 2010g, in litt.). Oppenheimer (2011, pers. comm.) suggests that the drought over the past couple of years on Molokai may have suppressed the growth of *Festuca molokaiensis* and prevented its observation by botanists in the field. He also suggested that this species may be an annual whose growth will be stimulated by normal rainfall patterns.

Geranium hanaense (nohoanu), a shrub in the geranium family (Geraniaceae), is found on Maui (Wagner *et al.* 1999e, pp. 730–732). This species was first collected in 1973, from two adjacent montane bogs on the northeast rift of Haleakala, east Maui (Medeiros and St. John 1988, pp. 214–220). At that time, there were an estimated 500 to 700 individuals (Medeiros and St. John 1988, pp. 214–220). Currently, *G. hanaense* occurs in ''Big Bog'' and ''Mid Camp Bog'' in the montane wet ecosystem on the northeast rift of Haleakala, with the same number of estimated individuals (Welton 2008, in litt.; Welton 2010a, in litt.; Welton 2010b, in litt.).

Geranium hillebrandii (nohoanu), a shrub in the geranium family (Geraniaceae), is found on Maui (Aedo and Munoz Garmendia 1997; p. 725; Wagner *et al.* 1999e, pp. 732–733; Wagner and Herbst 2003, p. 28). Little is known of the historical locations of *G. hillebrandii,* other than the type collection made in the 1800s at Eke Crater, in the west Maui mountains (Hillebrand 1888, p. 56). Currently, 4 occurrences total over 10,000 individuals, with the largest 2 occurrences in the west Maui bogs, from Puu Kukui to East Bog and Kahoolewa ridge. A third occurrence is at Eke

Crater and the surrounding area, and the fourth occurrence is at Lihau (HBMP 2008; Oppenheimer 2010h, in litt.). These occurrences are found in the montane wet and montane mesic ecosystems on west Maui (TNC 2007).

Mucuna sloanei var. *persericea* (sea bean), a vine in the pea family (Fabaceae), is found on Maui (Wilmot-Dear 1990, pp. 27–29; Wagner *et al.* 2005a—*Flora of the Hawaiian Islands database*). In her revision of *Mucuna* in the Pacific Islands, Wilmot-Dear recognized this variety from Maui based on leaf indumentum (covering of fine hairs or bristles) (Wilmot-Dear 1990, p. 29). At the time of Wilmot-Dear's publication, *M. sloanei* var. *persericea* ranged from Makawao to Wailua Iki, on the windward slopes of the east Maui mountains (Wagner *et al.* 2005a—*Flora of the Hawaiian Islands database*). Currently, there are possibly a few hundred individuals in five occurrences: Ulalena Hill, north of Kawaipapa Gulch, lower Nahiku, Koki Beach, and Piinau Road, all in the lowland wet ecosystem on east Maui (Duvall 2010, in litt.; Hobdy 2010, in litt.).

Myrsine vaccinioides (kolea), a shrub in the myrsine family (Myrsinaceae), is found on Maui (Wagner *et al.* 1999f, p. 946; HBMP 2008). This species was historically known from shrubby bogs near Violet Lake on west Maui (Wagner *et al.* 1999f, p. 946). In 2005, three occurrences of a few hundred individuals were reported at Eke, Puu Kukui and near Violet Lake (Oppenheimer 2006c, in litt.). Currently, there are estimated to be several hundred, but fewer than 1,000, individuals scattered in the summit area of the west Maui mountains at Eke Crater, Puu Kukui, Honokowai-Honolua, and Kahoolewa, in the montane wet ecosystem (Oppenheimer 2010i, in litt.).

Peperomia subpetiolata (alaala wai nui), a perennial herb in the pepper family (Piperaceae), is found on Maui (Wagner *et al.* 1999g, p. 1035; HBMP 2008). Historically, *P. subpetiolata* was known only from the lower Waikamoi (Kula pipeline) area on the windward side of Haleakala on east Maui (Wagner *et al.* 1999g, p. 1,035; HBMP 2008). In 2001, it was estimated that 40 individuals occurred just west of the Makawao-Koolau FR boundary, in the montane wet ecosystem. *Peperomia cookiana* and *P. hirtipetiola* also occur in this area, and are known to hybridize with *P. subpetiolata* (NTBG 2009g, p. 2; Oppenheimer 2010j, in litt.). In 2007, 20 to 30 hybrid plants were observed at Maile Trail, and at three areas near the Waikamoi Flume road (NTBG 2009g, p. 2). Based on the 2007 and 2010 surveys, all known plants are now considered to be hybrids mostly between *P. subpetiolata* and *P. cookiana,* with a smaller number of hybrids between *P. subpetiolata* and *P. hirtipetiola* (NTBG 2009g, p. 2; Lau 2011, in litt.). *Peperomia subpetiolata* is recognized as a valid species and botanists continue to search for plants in its previously known locations as well as in new locations with potentially suitable habitat (NTBG 2009g, p. 2; PEPP 2010, p. 96; Lau 2011, pers. comm.).

Phyllostegia bracteata (NCN), a perennial herb in the mint family (Lamiaceae), is found on Maui (Wagner *et al.* 1999h, pp. 814–815). Historically, this species was known from the east Maui mountains at Ukulele, Puu Nianiau, Waikamoi Gulch, Koolau Gap, Kipahulu, Nahiku-Kuhiwa trail, Waihoi Valley, and Manawainui; and from the west Maui mountains at Puu Kukui and Hanakaoo (HBMP 2008). This species appears to be short-lived, ephemeral, and disturbance-dependent, in the lowland wet, montane mesic, montane wet, subalpine, and wet cliff ecosystems (NTBG 2009h, p. 1). There have been several reported sightings of *P. bracteata* between 1981 and 2001, at Waihoi Crater Bog, Waikamoi Preserve, Waikamoi flume, and Kipahulu on east Maui, and at Pohakea Gulch on west Maui; however, none of these individuals were extant as of 2009 (PEPP 2009, pp. 89–90). In 2009, one individual was found at Kipahulu, near Delta Camp, on east Maui, but was not relocated on a follow-up survey during that same year (NTBG 2009h, p. 3). Botanists continue to search for *P. bracteata* in previously reported locations, as well as in other areas with potentially suitable habitat (NTBG 2009h, p. 3; PEPP 2009, pp. 89–90).

Phyllostegia haliakalae (NCN), a vine in the mint family (Lamiaceae), is known from Molokai, Lanai, and east Maui (Wagner 1999, p. 269). The type specimen was collected by Wawra in 1869 or 1870, in a dry ravine at the foot of Haleakala. An individual was found in flower on the eastern slope of Haleakala, in the wet cliff ecosystem, in 2009; however, this plant has died (TNC 2007; Oppenheimer 2010b, in litt.). Collections were made before the plant died, and propagules outplanted in the Puu Mahoe Arboretum (three plants) and Olinda Rare Plant Facility (four plants) (Oppenheimer 2011b, in litt.). Botanists continue to search in areas with potentially suitable habitat for this plant (Oppenheimer 2010b, in litt.). *Phyllostegia haliakalae* was last reported from the lowland mesic ecosystem on Molokai in 1928, and from the dry cliff and wet cliff ecosystems on Lanai in the early 1900s (TNC 2007; HBMP 2008). Currently no individuals are known in the wild on Maui, Molokai, or Lanai.

Phyllostegia pilosa (NCN), a vine in the mint family (Lamiaceae), is known from east Maui (Wagner 1999, p. 274). There are two occurrences totaling seven individuals west of Puu o Kakae on east Maui, in the montane wet ecosystem (TNC 2007; HBMP 2008). The individuals identified as *P. pilosa* on Molokai, at Kamoku Flats (montane wet ecosystem) and at Mooloa (lowland mesic ecosystem), have not been observed since the early 1900s (TNC 2007; HBMP 2008).

Pittosporum halophilum (hoawa), a shrub or small tree in the pittosporum family (Pittosporaceae), is found on Molokai (Wood 2005, pp. 2, 41). This species was reported from Huelo islet, Mokapu Island, Okala Island, and Kukaiwaa peninsula. On Huelo islet, there were two individuals in 1994, and in 2001, only one individual remained (Wood *et al.* 2001, p. 12; Wood *et al.* 2002, pp. 18–19). The current status of this species on Huelo islet is unknown. On Mokapu Island, there were 15 individuals in the coastal ecosystem in 2001, and in 2005, 10 individuals remained. On Okala Island, there were two individuals in 2005, and one individual on the sea cliff at Kukaiwaa peninsula (Wainene) (Wood 2005, pp. 2, 41). As of 2010, there were three occurrences totaling five individuals: Three individuals on Mokapu Island, one individual on Okala Island, and one individual on Kukaiwaa peninsula (Bakutis 2010, in litt.; Hobdy 2010, in litt.; Perlman 2010, in litt.). At least 17 individuals have been outplanted at 3 sites on the coastline of the nearby Kalaupapa peninsula (Garnett 2010a, in litt.).

Pleomele fernaldii (hala pepe), a tree in the asparagus family (Asparagaceae), is found only on the island of Lanai (Wagner *et al.* 1999i, p. 1,352; Wagner and Herbst 2003, p. 67). Historically known throughout Lanai, this species is currently found in the lowland dry, lowland mesic, lowland wet, dry cliff, and wet cliff ecosystems, from Hulopaa and Kanoa gulches southeast to Waiakeakua and Puhielelu (St. John 1947, pp. 39–42 cited in St. John 1985, pp. 171, 177–179; HBMP 2006; HBMP 2008; PEPP 2008, p. 75; Oppenheimer 2010d, in litt.). Currently, there are several hundred to perhaps as many as 1,000 individuals. The number of individuals has decreased by about one-half in the past 10 years (there were more than 2,000 individuals in 1999), with very little recruitment observed recently (Oppenheimer 2008d, in litt.).

Santalum haleakalae var. *lanaiense* (iliahi, Lanai sandalwood) is a tree in the sandalwood family (Santalaceae). Currently, *S. haleakalae* var. *lanaiense* is known from Molokai, Lanai, and Maui, in 26 occurrences totaling fewer than 2,000 individuals (Wagner *et al.* 1999c, pp. 1,221–1,222; HBMP 2008; Harbaugh *et al.* 2010, pp. 834–835). On Molokai, there are more than 12 individuals in 4 occurrences from Kikiakala to Kamoku Flats and Puu Kokekole, with the largest concentration at Kumueli Gulch, in the montane mesic and lowland mesic ecosystems (Harbaugh *et al.* 2010, pp. 834–835). On Lanai, there are approximately 10 occurrences totaling 30 to 40 individuals: Kanepuu, in the lowland mesic ecosystem (5 individuals); the headwaters of Waiopae Gulch in the lowland wet ecosystem (3 individuals); the windward side of Hauola on the upper side of Waiopae Gulch in the lowland mesic ecosystem (1 individual); the drainage to the north of Puhielelu Ridge and exclosure, in the headwaters of Lopa Gulch in the lowland mesic ecosystem (3 individuals); 6 occurrences near Lanaihale in the montane wet ecosystem (21 individuals); and the mountains east of Lanai City in the lowland wet ecosystem (a few individuals) (HBMP 2008; Harbaugh *et al.* 2010, pp. 834–835; HBMP 2010; Wood 2010a, in litt.). On west Maui, there are eight single individual occurrences: Hanaulaiki Gulch in the lowland dry ecosystem; Kauaula and Puehuehunui Gulches in the lowland mesic, montane mesic, and wet cliff ecosystems; Kahanahaiki Gulch and Honokowai Gulch in the lowland wet ecosystem; Wakihuli in the wet cliff ecosystem; and Manawainui Gulch in the montane mesic and lowland dry ecosystems (HBMP 2008; Harbaugh *et al.* 2010, pp. 834–835; Wood 2010a, in litt.). On east Maui, there are 4 occurrences (10 individuals) in Auwahi, in the montane mesic, montane dry, and lowland dry ecosystems (TNC 2007; HBMP 2008; Harbaugh *et al.* 2010, pp. 834–835).

Schiedea jacobii (NCN), a perennial herb or subshrub in the pink family (Caryophyllaceae), occurs only on Maui (Wagner *et al.* 1999j, p. 284). Discovered in 1992, the single occurrence consisted of nine individuals along wet cliffs between Hanawi Stream and Kuhiwa drainage (in Hanawi Natural Area Reserve), in the montane wet ecosystem on east Maui (Wagner *et al.* 1999j, p. 286). By 1995, only four plants could be relocated in this location. It appeared that the other five known individuals had been destroyed by a landslide (Wagner *et al.* 1999j, p. 286). In 2004, one seedling was observed in the same location, and in 2010, no individuals were relocated (Perlman 2010, in litt.). The State of Hawaii plans to outplant propagated individuals in a fenced area in Hanawi Natural Area Reserve in 2011 (Oppenheimer 2010a, in litt.; Perlman 2010, in litt.).

Schiedea laui (NCN), a perennial herb or subshrub in the pink family (Caryophyllaceae), is found only on Molokai (Wagner *et al.* 2005b, pp. 90–92). In 1998, when this species was first observed, there were 19 individuals located in a cave along a narrow stream corridor at the base of a waterfall in the Kamakou Preserve, in the montane wet ecosystem (Wagner *et al.* 2005b, pp. 90–92). By 2000, only nine individuals with a few immature plants and seedlings were relocated, and in 2006, 13 plants were seen (Wagner *et al.* 2005b, pp. 90–92; PEPP 2007, p. 57). Currently, there are 24 to 34 individuals in the same location in Kamakou Preserve (Bakutis 2010, in litt.).

Schiedea salicaria (NCN), a shrub in the pink family (Caryophyllaceae), occurs on Maui (Wagner *et al.* 1999j, pp. 519–520). It is historically known from a small area on west Maui, from Lahaina to Waikapu. Currently, this species is found in three occurrences: Kaunoahua gulch (500 to 1,000 individuals), Puu Hona (about 50 individuals), and Waikapu Stream (3 to 5 individuals), in the lowland dry ecosystem on west Maui (TNC 2007; Oppenheimer 2010k, in litt.; Oppenheimer 2010l, in litt.). Hybrids and hybrid swarms (hybrids that can interbreed with other hybrids and parent species) between *S. salicaria* and *S. menziesii* are known on the western side of west Maui (Wagner *et al.* 2005b, p. 138).

Stenogyne kauaulaensis (NCN), a vine in the mint family (Lamiaceae), occurs on Maui. This recently described (2008) plant is found only along the southeastern rim of Kauaula Valley, in the montane mesic ecosystem on west Maui (TNC 2007; Wood and Oppenheimer 2008, pp. 544–545). At the time *S. kauaualuaensis* was described, the authors reported a total of 15 individuals at one occurrence. However, one of the authors reports that due to the clonal (genetic duplicate) growth habit of this species, botanists believe it is currently represented by only three genetically distinct individuals (Oppenheimer 2010k, in litt.).

Wikstroemia villosa (akia), a shrub or tree in the akia family (Thymelaeaceae), is found on Maui (Peterson 1999, pp. 1,290–1,291). Historically known from the lowland wet, montane wet, and montane mesic ecosystems on east and west Maui, this species is currently known from a recent discovery (2007) of one individual on the windward side of Haleakala (on east Maui), in the montane wet ecosystem (Peterson 1999, p. 1,291; TNC 2007; HBMP 2008). As of 2010, there was one individual and one seedling at the same location (Oppenheimer 2010m, in litt.). In addition, three individuals have been outplanted in Waikamoi Preserve (Oppenheimer 2010m, in litt.).

Animals

Newcomb's tree snail (*Newcombia cumingi*), a member of the family Achatinellidae and the endemic Hawaiian subfamily Achatinellinae (Newcomb 1853, p. 25), is known only from the island of Maui (Cowie *et al.* 1995, p. 62). All members of this species have sinistral (left-coiling), oblong, spindle-shaped shells of five to seven whorls that are coarsely sculptured (Cooke and Kondo 1960, pp. 9, 33). Newcomb's tree snail reaches an adult length of approximately 0.8 in (21 mm) and its shell is mottled in shades of brown that blend with the bark of its native host plant, *Metrosideros polymorpha* (ohia) (Pilsbry and Cooke 1912–1914, p. 10; Thacker and Hadfield 1998, p. 4). The exact life span and fecundity of Newcomb's tree snails is unknown, but they attain adult size within 4 to 5 years (Thacker and Hadfield 1998, p. 2). Newcomb's tree snail is believed to exhibit the low reproductive rate of other Hawaiian tree snails belonging to the same family (Thacker and Hadfield 1998, p. 2). It feeds on fungi and algae that grow on the leaves and trunks of its host plant (Pilsbry and Cooke 1912–1914, p. 103). Historically, this species was distributed from the west Maui mountains (near Lahaina and Wailuku) to the slopes of Haleakala (Makawao) on east Maui (Pilsbry and Cooke 1912–1914, p. 10). In 1994, a small population of Newcomb's tree snail was found on a single ridge on the northeastern slope of the west Maui mountains, in the lowland wet ecosystem (Thacker and Hadfield 1998, p. 3; TNC 2007). Eighty-six snails were documented in the same location in 1998; however, in 2006, only nine individuals were located (Thacker and Hadfield 1998, p. 2; Hadfield 2007, p. 8).

Partulina semicarinata (Lanai tree snail, pupu kani oe), a member of the family Achatinellidae and the endemic Hawaiian subfamily Achatinellinae, is known only from the island of Lanai (Pilsbry and Cooke 1912–1914, p. 86). The shell may coil to the right (dextral) or left (sinistral), but appears to be

constant within a population. The oblong to ovate shells of the adult are 0.6 to 0.8 in (16 to 20 mm) long, have 5 to 7 whorls, and range in color from rusty brown to white, with some individuals having bands around the shells. The shell has a distinctive keel that runs along the last whorl, and is more distinctive in juveniles (Pilsbry and Cooke 1912–1914, pp. 86–88). Adults may attain an age exceeding 15 to 20 years, and reproductive output is low, with an adult snail giving birth to 4 to 6 live young per year (Hadfield and Miller 1989, pp. 10–12). *Partulina semicarinata* is arboreal and nocturnal, and grazes on fungi and algae growing on leaf surfaces (Pilsbry and Cooke 1912–1914, p. 103). This snail species is found on the following native host plants: *Metrosideros polymorpha, Broussaisia arguta* (kanawao), *Psychotria* spp. (kopiko), *Coprosma* spp. (pilo), *Melicope* spp. (alani), and dead *Cibotium glaucum* (tree fern, hapuu). Occasionally the snail is found on nonnative plants such as *Psidium guajava* (guava), *Cordyline australis* (New Zealand tea tree), and *Phormium tenax* (New Zealand flax) (Hadfield 1994, p. 2). Historically, *P. semicarinata* was found in wet and mesic *Metrosideros polymorpha* forests on Lanai. There are no historical population estimates for this snail, but qualitative accounts of Hawaiian tree snails indicates they were widespread and abundant, possibly numbering in the tens of thousands between the 1800s and early 1900s (Hadfield 1986, p. 69). In 1993, 105 individuals of *P. semicarinata* were found during surveys conducted in its historical range. Subsequent surveys in 1994, 2000, 2001, and 2005 documented 55, 12, 4, and 29 individuals, respectively, in the lowland wet, montane wet, and wet cliff ecosystems in central Lanai (Hadfield 2005, pp. 3–5; TNC 2007).

Partulina variabilis (Lanai tree snail, pupu kani oe), a member of the family Achatinellidae and the endemic Hawaiian subfamily Achatinellinae, is known only from the island of Lanai (Pilsbry and Cooke 1912–1914, p. 86). The shell may coil to the right (dextral) or left (sinistral), and both types can be found within a single population. The oblong to ovate shells of the adult are 0.5 to 0.6 in (14 to 16 mm) long, have 5 to 7 whorls, and have a white base color with no bands or a variable number of spiral bands around the shells (Pilsbry and Cooke 1912–1914, pp. 67, 83–86). Adults may attain an age exceeding 15 to 20 years, and reproductive output is low, with an adult snail giving birth to 4 to 6 live young per year (Hadfield and Miller 1989, pp. 10–12). *Partulina variabilis* is arboreal and nocturnal, and grazes on fungi and algae growing on leaf surfaces (Pilsbry and Cooke 1912–1914, p. 103). This snail is found on the following native host plants: *Metrosideros polymorpha, Broussaisia arguta, Psychotria* spp., *Coprosma* spp., *Melicope* spp., and dead *Cibotium glaucum*. Occasionally *Partulina variabilis* is found on nonnative plants such as *Psidium guajava* and *Cordyline australis* (Hadfield 1994, p. 2). Historically, *Partulina variabilis* was found in wet and mesic *Metrosideros polymorpha* forests on Lanai. There are no historical population estimates for this snail, but qualitative accounts of Hawaiian tree snails indicate they were widespread and abundant, possibly numbering in the tens of thousands between the 1800s and early 1900s (Hadfield 1986, p. 69). In 1993, 111 individuals of *Partulina variabilis* were found during surveys conducted in its historical range. Subsequent surveys in 1994, 2000, 2001, and 2005 documented 175, 14, 6, and 90 individuals, respectively, in the lowland wet, montane wet, and wet cliff ecosystems in central Lanai (Hadfield 2005, pp. 3–5; TNC 2007).

Summary of Factors Affecting the 40 Species Proposed or Reevaluated for Listing

Section 4 of the Act (16 U.S.C. 1533) and its implementing regulations (50 CFR part 424) set forth the procedures for adding species to the Federal Lists of Endangered and Threatened Wildlife and Plants. A species may be determined to be an endangered or threatened species due to one or more of the five factors described in section 4(a)(1) of the Act: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; and (E) other natural or manmade factors affecting its continued existence. Listing actions may be warranted based on any of the above threat factors, singly or in combination. Each of these factors is discussed below.

In considering what factors might constitute threats to a species; we must look beyond the exposure of the species to a particular factor to evaluate whether the species may respond to that factor in a way that causes actual impacts to the species. If there is exposure to a factor and the species responds negatively, the factor may be a threat and, during the status review, we attempt to determine how significant a threat it is. The threat is significant if it drives, or contributes to, the risk of extinction of the species such that the species warrants listing as endangered or threatened as those terms are defined in the Act. However, the identification of factors that could impact a species negatively may not be sufficient to warrant listing the species under the Act. The information must include evidence sufficient to show that these factors are operative threats that act on the species to the point that the species meets the definition of endangered or threatened under the Act.

If we determine that the level of threat posed to a species by one or more of the five listing factors is such that the species meets the definition of either endangered or threatened under section 3 of the Act, that species may then be proposed for listing. The Act defines an endangered species as ''in danger of extinction throughout all or a significant portion of its range,'' and a threatened species as ''likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.'' The threats to each of the individual 40 species proposed for listing here are summarized in Table 3, and discussed in detail below.

Assumptions

We acknowledge that the specific nature of the threats to the individual species being proposed for listing are not completely understood. Scientific research directed toward each of the species proposed for listing is limited because of their rarity and the challenging logistics associated with conducting field work in Hawaii (e.g., areas are typically remote, difficult to access and work in, and expensive to survey in a comprehensive manner). However, there is information available on many of the threats that act on Hawaiian ecosystems, and, for some ecosystems, these threats are well studied and understood. Each of the native species that occurs in Hawaiian ecosystems suffers from exposure to those threats to differing degrees. For the purposes of our listing determination, our assumption is that the threats that act at the ecosystem level also act on each of the species that occurs in those ecosystems (although in some cases we have additionally identified species-specific threats, such as predation by nonnative invertebrates). Similarly, for the purposes of our critical habitat determinations, the physical or biological features that support an adequately functioning ecosystem are

the physical or biological features required by the species that occur in those ecosystems (see ''Critical Habitat'' section, below).

The following constitutes a list of ecosystem-level threats that affect the species proposed or reevaluated for listing in all 11 ecosystems on the islands of Maui Nui:

(1) Foraging and trampling of native plants by ungulates, including feral pigs (*Sus scrofa*), goats, cattle (*Bos taurus*), axis deer (*Axis axis*), or mouflon sheep (*Ovis gmelini musimon*), which can result in severe erosion of watersheds because these mammals inhabit terrain that is often steep and remote (Cuddihy and Stone 1990, p. 63). Foraging and trampling events destabilize soils that support native plant communities, bury or damage native plants, and have adverse water quality effects due to runoff over exposed soils.

(2) Disturbance of soils by feral pigs from rooting, which can create fertile seedbeds for alien plants (Cuddihy and Stone 1990, p. 65).

(3) Increased nutrient availability as a result of pigs rooting in nitrogen-poor soils, which facilitates establishment of alien weeds. Alien weeds are more adapted to nutrient rich soils than native plants (Cuddihy and Stone 1990, p. 63), and rooting activity creates open areas in forests allowing alien species to completely replace native stands.

(4) Ungulate destruction of seeds and seedlings of native plant species (Cuddihy and Stone 1990, p. 63), which facilitates the conversion of disturbed areas from native to nonnative vegetative communities.

(5) Rodent damage to plant propagules, seedlings, or native trees, which changes forest composition and structure (Cuddihy and Stone 1990, p. 67).

(6) Feeding or defoliation of native plants from alien insects, which can reduce geographic ranges of some species because of damage (Cuddihy and Stone 1990, p. 71).

(7) Alien insect predation on native insects, which affects pollination of native plant species (Cuddihy and Stone 1990, p. 71).

(8) Significant changes in nutrient cycling processes because of large numbers of alien invertebrates such as earthworms, ants, slugs, isopods, millipedes, and snails, resulting in changes to the composition and structure of plant communities (Cuddihy and Stone 1990, p. 73).

Each of the above threats is discussed in more detail below, and summarized in Table 3. The most-often cited effects of nonnative plants on native plant species are competition and displacement; competition may be for water, light, or nutrients, or it may involve allelopathy (chemical inhibition of other plants). Alien plants may displace native species of plants by preventing their reproduction, usually by shading and taking up available sites for seedling establishment. Alien plant invasions may also alter entire ecosystems by forming monotypic stands, changing fire characteristics of native communities, altering soil-water regimes, changing nutrient cycling, or encouraging other nonnative organisms (Smith 1989, pp. 61–69; Vitousek *et al.* 1987).

TABLE 3—SUMMARY OF PRIMARY THREATS IDENTIFIED FOR EACH OF THE 40 MAUI NUI SPECIES

Species	Ecosystem	Factor A						Factor B	Factor C				Factor D	Factor E
		Agriculture and urban development	Ungulates	Non native plants	Fire	Stochastic events	Climate change	Over-utilization	Disease	Predation/ Herbivory by ungulates	Predation/ Herbivory by other NN vertebrates	Predation/ Herbivory by NN invertebrates	Inadequate existing regulatory mechanisms	Other species-specific threats
Plants														
Bidens campylotheca ssp. *pentamera*	LD, LM, MM, MW, DC, WC		P, G, D	X	X	H	X	.....	.....	P, G, D	R		X	HY
Bidens campylotheca ssp. *waihoiensis*	LW, MW, WC		P, G, D	X	.....	F, H	X	.....	.....	P, G, D	R	S	X	HY
Bidens conjuncta	LW, MW, WC		P, G	X	.....	H	X	.....	.....	P, G	R	S	X	
Calamagrostis hillebrandii	MW		P	X	.....	H	X	.....	.....	P			X	
Canavalia pubescens	CO, LD	X	P, G, D, C	X	X	H	X	.....	.....	P, G, D, C			X	
Cyanea asplenifolia	LM, LW		P, G, D, C	X	.....	L, H	X	.....	.....	P, G, D, C	R	S	X	
Cyanea duvalliorum	LW, MW		P	X	.....	F, H	X	.....	.....	P	R	S	X	
Cyanea grimesiana ssp. *grimesiana*	LW, WC		P, G, D	X	X	L, H	X	.....	.....	P, G, D	R	S	X	LN
Cyanea horrida	MM, MW, WC		P	X	.....	DR, F, L, TF, H	X	.....	.....	P	R	S	X	LN
Cyanea kunthiana	LW, MM, MW		P	X	.....	H	X	.....	.....	P	R	S	X	
Cyanea magnicalyx	LW, MM, WC		P	X	X	L, TF, H	X	.....	.....	P	R	S	X	LN
Cyanea maritae	LW, MW		P	X	.....	L, TF, H	X	.....	.....	P	R	S	X	LN, T
Cyanea mauiensis	LM, DC		P	X	X	L, TF, H	X	.....	.....	P	R	S	X	LN
Cyanea munroi	WC		G, D	X	.....	TF, H	X	.....	.....	G, D	R	S	X	LN
Cyanea obtusa	LD, MM		P, G, D, C	X	X	H	X	.....	.....	P, G, D, C	R	S	X	HY, LN
Cyanea profuga	LM, MW		P, G	X	.....	F, L, RF, TF, H	X	.....	.....	P, G	R	S	X	LN
Cyanea solanacea	LM, LW, MM, MW		P, G	X	.....	L, H	X	.....	.....	P, G	R	S	X	LN
Cyrtandra ferripilosa	MM, MW		P, G	.....	.....	H	X	.....	.....	P, G			X	LN
Cyrtandra filipes	LM, LW, WC		P, G, D	X	.....	L, H	X	.....	.....	P, G, D		S	X	
Cyrtandra oxybapha	MM, MW		P, G, C	X	.....	H	X	.....	.....	P, G, C			X	
Festuca molokaiensis	LM		G	X	X	DR, H	X	.....	.....	G			X	LN
Geranium hanaense	MW		P	X	.....	H	X	.....	.....	P			X	
Geranium hillebrandii	MM, MW		P	X	.....	H	X	.....	.....	P		S	X	
Mucuna sloanei var. *persericea*	LW		P, C	X	.....	H	X	.....	.....	P, C	R		X	
Myrsine vaccinioides	MW		P	X	.....	H	X	.....	.....	P	R	S	X	
Peperomia subpetiolata	MW		P	X	.....	H	X	.....	.....	P	R	S	X	HY, LN
Phyllostegia bracteata	LW, MM, MW, SB, WC		P, C	X	X	H	X	.....	.....	P, C		S	X	LN
Phyllostegia haliakalae	LM, DC, WC		C	X	X	H	X	.....	.....	C		S	X	LN
Phyllostegia pilosa	LM, MW		P, G	X	.....	H	X	.....	.....	P, G		S	X	LN
Pittosporum halophilum	CO		P	X	X	H	X	.....	.....	P	R		X	LN
Pleomele fernaldii	LD, LM, LW, DC, WC		D, M	X	X	H	X	.....	.....	D, M	R		X	NR
Santalum haleakalae var. *lanaiensis*	LD, LM, LW, MD, MM, MW, WC		P, G, D, M	X	X	H	X	.....	.....	P, G, D, M	R	S	X	
Schiedea jacobii	MW		G, D, C	.....	.....	DR, L, TF, H	X	.....	.....	G, D, C		S	X	LN
Schiedea laui	MW			X	.....	F, L, H	X	.....	.....		R	S	X	LN
Schiedea salicaria	LD		G, D, C	X	X	H	X	.....	.....	D, C, G			X	HY
Stenogyne kauaulaensis	MM			X	X	DR, L, RF, H	X	.....	.....			S	X	LN
Wikstroemia villosa	LW, MM, MW		P	X	.....	L, H	X	.....	.....	P	R	S	X	LN, T
Snails														
Newcombia cumingi (Newcomb's tree snail).	LW			X	.....	DR, H	X	Pt	Pt		R, JC	Flatworm Pt Snails	X	LN
Partulina semicarinata (Lanai tree snail)	LW, MW, WC		D, M	.....	.....	DR, H	X	Pt	Pt		R, JC	Flatworm Pt Snails	X	LN
Partulina variabilis (Lanai tree snail)	LW, MW, WC		D, M	.....	.....	DR, H	X	Pt	Pt		R, JC	Flatworm Pt Snails	X	LN

Factor A = Habitat Modification; Factor B = Overutilization; Factor C = Disease or Predation; Factor D = Inadequacy of Regulatory Mechanisms; Factor E = Other Species-Specific Threats.
CO = Coastal; LD = Lowland Dry; LM = Lowland Mesic; LW = Lowland Wet; MD = Montane Dry; MM = Montane Mesic; MW = Montane Wet; SB = Subalpine; DC = Dry Cliff; WC = Wet Cliff.
P = Pigs; G = Goats; D = Axis Deer; M = Mouflon; C = Cattle; R = Rats; S = Slugs; JC = Jackson's chameleon.
F = Flooding; DR = Drought; H = Hurricane; L = Landslide; T = Trampling; RF = Rockfalls; TF = Treefalls.
LN = Limited Numbers; HY = Hybridization; NN = Nonnative; NR = No Regeneration; Pt = Potential.

A. The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range

The Hawaiian Islands are located over 2,000 mi (3,200 km) from the nearest continent. This isolation has allowed the few plants and animals that arrived in the Hawaiian Islands to evolve into many highly varied and endemic species (species that occur nowhere else in the world). The only native terrestrial mammals in the Hawaiian Islands are two bat taxa, the extant Hawaiian hoary bat (*Lasiurus cinereus semotus*) and an extinct, unnamed insectivorous bat (Ziegler 2002, p. 245). The native plants of the Hawaiian Islands, therefore, evolved in the absence of mammalian predators, browsers, or grazers. As a result, many of the native species have lost unneeded defenses against threats such as mammalian predation and competition with aggressive, weedy plant species that are typical of continental environments (Loope 1992, p. 11; Gagne and Cuddihy 1999, p. 45; Wagner *et al.* 1999l, pp. 3–6). For example, Carlquist (in Carlquist and Cole 1974, p. 29) notes ''Hawaiian plants are notably free from many characteristics thought to be deterrents to herbivores (toxins, oils, resins, stinging hairs, coarse texture).'' Native Hawaiian plants are therefore highly vulnerable to the impacts of introduced mammals and alien plants. In addition, species restricted and adapted to highly specialized locations (e.g., *Argyroxiphium sandwicense* ssp. *macrocephalum*) are particularly vulnerable to changes (from nonnative species, hurricanes, fire, and climate change) in their habitat (Carlquist and Cole 1974, pp. 28–29; Loope 1992, pp. 3–6; Stone 1989, pp. 88–95).

Habitat Destruction and Modification by Agriculture and Urban Development

The consequences of past land use practices such as agricultural or urban development have resulted in little or no native vegetation below 2,000 ft (600 m) throughout the Hawaiian Islands (TNC 2007), largely impacting the coastal, lowland dry, lowland mesic, and lowland wet ecosystems. Although agriculture has been declining in importance, large tracts of former agricultural lands are being converted into residential areas or left fallow (TNC 2007). In addition, Hawaii's population increased almost 7 percent in the past 10 years, further increasing demands on limited land and water resources in the islands (Hawaii Department of Business, Economic Development and Tourism 2010).

Development and urbanization of coastal and lowland dry ecosystems on Maui are a serious threat to one species proposed for listing in this rule, *Canavalia pubescens,* which is dependent on these ecosystems and is currently found only in east Maui. Two individuals at Palauea-Keahou were destroyed by development prior to 2001 (Oppenheimer 2000, in litt.). Future development plans for this area include a golf course and associated infrastructure (Altenberg 2007, p. 2–5). Currently, fewer than 20 known individuals of *C. pubescens* persist in this area (Altenberg 2010, in litt.).

Habitat Destruction and Modification by Introduced Ungulates

Introduced mammals have greatly impacted the native vegetation, as well as the native fauna, of the Hawaiian Islands. Impacts to the native species and ecosystems of Hawaii accelerated following the arrival of Captain James Cook in 1778. The Cook expedition and subsequent explorers intentionally introduced a European race of pigs or boars and other livestock, such as goats, to serve as food sources for seagoing explorers (Tomich 1986, pp. 120–121; Loope 1998, p. 752). The mild climate of the islands, combined with the lack of competitors or predators, led to the successful establishment of large populations of these introduced mammals, to the detriment of native Hawaiian species and ecosystems. The presence of introduced alien mammals is considered one of the primary factors underlying the alteration and degradation of native plant communities and habitats on Molokai, Lanai, and Maui. Ten ecosystems (coastal, lowland dry, lowland mesic, lowland wet, montane dry, montane mesic, montane wet, subalpine, dry cliff, and wet cliff) on Molokai, Lanai, and Maui and their associated species are currently threatened by the destruction or degradation of habitat due to nonnative ungulates (hoofed mammals), including pigs, goats, axis deer, mouflon, and cattle. Thirty-five of the 37 plant species and both species of *Partulina* tree snails (*Partulina semicarinata* and *P. variabilis*) proposed or reevaluated for listing in this rule are threatened by habitat degradation or destruction by ungulates (Table 3).

Pigs have been described as the most pervasive and disruptive nonnative influence on the unique native forests of the Hawaiian Islands, and are widely recognized as one of the greatest current threats to forest ecosystems in Hawaii (Aplet *et al.* 1991, p. 56; Anderson and Stone 1993, p. 195). European pigs, introduced to Hawaii by Captain James Cook in 1778, hybridized with domesticated Polynesian pigs, became feral, and invaded forested areas, especially wet and mesic forests and dry areas at high elevations. The Hawaii Territorial Board of Agriculture and Forestry started a feral pig eradication project in the early 1900s that continued through 1958, removing 170,000 pigs from forests Statewide (Diong 1982, p. 63). Feral pigs are currently present on Niihau, Kauai, Oahu, Molokai, Maui, and Hawaii.

These feral animals are extremely destructive and have both direct and indirect impacts on native plant communities. While rooting in the earth in search of invertebrates and plant material, pigs directly impact native plants by disturbing and destroying vegetative cover, and trampling plants and seedlings. It has been estimated that at a conservative rooting rate of 2 square (sq)-yards (yd) per minute, with only 4 hours of foraging a day, a single pig could disturb over 1,600 sq-yd of groundcover per week (Anderson *et al.* 2007, p. 2).

Pigs may also reduce or eliminate plant regeneration by damaging or eating seeds and seedlings (further discussion of predation by nonnative ungulates is provided under Factor C, below). Pigs are a major vector for the establishment and spread of competing invasive nonnative plant species by dispersing plant seeds on their hooves and fur, and in their feces (Diong 1982, pp. 169–170), which also serves to fertilize disturbed soil (Matson 1990, p. 245; Siemann *et al.* 2009, p. 547). Pigs feed on the fruits of many nonnative plants, such as *Passiflora tarminiana* (banana poka) and *Psidium cattleianum* (strawberry guava), spreading the seeds of these invasive species through their feces as they travel in search of food. Pigs also feed on native plants, such as Hawaiian tree ferns that they root up to eat the core of the trunk. These cored trunks then fill with rainwater and serve as breeding sites for introduced mosquitos that spread nonnative avian malaria, with devastating consequences for Hawaii's native forest birds (Baker 1975, p. 79). In addition, rooting pigs contribute to erosion by clearing vegetation and creating large areas of disturbed soil, especially on slopes (Smith 1985, pp. 190, 192, 196, 200, 204, 230–231; Stone 1985, pp. 254–255, 262–264; Medeiros *et al.* 1986, pp. 27–28; Scott *et al.* 1986, pp. 360–361; Tomich 1986, pp. 120–126; Cuddihy and Stone 1990, pp. 64–65; Aplet *et al.* 1991, p. 56; Loope *et al.* 1991, pp. 1–21; Gagne and Cuddihy 1999, p. 52). Ten of the Maui Nui ecosystems (coastal, lowland dry, lowland mesic, lowland

wet, montane dry, montane mesic, montane wet, subalpine, dry cliff, and wet cliff) and their associated species are currently threatened by the destruction or degradation of habitat due to pigs.

Goats native to the Middle East and India were also successfully introduced to the Hawaiian Islands in the late 1700s. Actions to control feral goat populations began in the 1920s (Tomich 1986, pp. 152–153); however, they still occupy a wide variety of habitats on Molokai and Maui and to a lesser degree on Lanai, where they consume native vegetation, trample roots and seedlings, accelerate erosion, and promote the invasion of alien plants (van Riper and van Riper 1982, pp. 34–35; Stone 1985, p. 261; Kessler 2010, pers. comm.). Goats are able to access, and forage in, extremely rugged terrain, and they have a high reproductive capacity (Clarke and Cuddihy 1980, pp. C–19, C–20; Culliney 1988, p. 336; Cuddihy and Stone 1990, p. 64). Because of these factors, goats are believed to have completely eliminated some plant species from islands (Atkinson and Atkinson 2000, p. 21). Goats can be highly destructive to native vegetation, and contribute to erosion by eating young trees and young shoots of plants before they can become established, creating trails that damage native vegetative cover, promoting erosion by destabilizing substrate and creating gullies that convey water, and dislodging stones from ledges that can cause rockfalls and landslides and damage vegetation below (Cuddihy and Stone 1990, pp. 63–64). Nine of the described ecosystems on Molokai, Lanai, and Maui (coastal, lowland dry, lowland mesic, lowland wet, montane dry, montane mesic, montane wet, dry cliff, and wet cliff) and their associated species are currently threatened by the destruction or degradation of habitat due to goats.

Axis deer were first introduced to Molokai in 1868, Lanai in 1920, and Maui in 1959 (Hobdy 1993, p. 207; Erdman 1996, pers. comm. cited in Waring 1996, in litt., p. 2; Hess 2008, p. 2). On Molokai, axis deer have likely spread throughout the island at all elevations (from the coast to the summit area at 4,961 ft (1,512 m)) (Kessler 2011, pers. comm.). The most current population estimate of axis deer on Molokai is between 4,000 and 5,000 individuals (Anderson 2003, p. 130). It is likely this is an underestimate of the total number of individuals as it was published almost a decade ago, and little management for deer control has been implemented. On Lanai, as of 2007, axis deer were reported to number approximately 6,000 to 8,000 individuals (The Aloha Insider 2008, in litt.; WCities 2010, in litt.). On Maui, five adults were released east of Kihei in 1959 (Hobdy 1993, p. 207; Hess 2008, p. 2). By 1968, the population was estimated to be 85 to 90 animals, and by 1995, there were over 500 individuals on Ulupalakua Ranch alone (Erdman 1996, pers. comm. cited in Waring 1996, in litt., p. 2). As of 2001, there was concern that their numbers on Maui could expand to between 15,000 to 20,000 or more individuals within a few years (Anderson 2001, in litt.; Nishibayashi 2001, in litt.). According to Medeiros (2010a, pers. comm.) axis deer can be found in all but the uppermost ecosystems (subalpine and alpine) and montane bogs on Maui. Medeiros (2010a, pers. comm.) also observed that axis deer are increasing at such high rates on Maui that native forests are changing in unprecedented ways. According to Medeiros (2010a, pers. comm.), native plants will only survive in habitat that is fenced or otherwise protected from the grazing and trampling effects of axis deer. Kessler (2010, pers. comm.) and Hess (2010, pers. comm.) report axis deer up to 9,000 ft (2,743 m) in elevation on Maui, and Kessler suggests that no ecosystem is safe from the negative impacts of these animals. Montane bogs are also susceptible to impacts from axis deer. As the native vegetation dies off from the combined effects of grazing and trampling by axis deer, the soil dries out, and invasive nonnative plants gain a foothold. Eventually, the bog habitat and its associated native plants and animals are replaced by a grassland, shrubland, or forest habitat dominated by nonnative plants.

Axis deer are primarily grazers, but also browse numerous palatable plant species including those grown as commercial crops (Waring 1996, p. 3; Simpson 2001, in litt.). They prefer the lower, more openly vegetated areas for browsing and grazing; however, during episodes of drought (e.g., from 1998–2001 on Maui (Medeiros 2010a, pers. comm.)), axis deer move into urban and forested areas in search of food (Waring 1996, in litt., p. 5; Nishibayashi 2001, in litt.). Like goats, axis deer can be highly destructive to native vegetation and contribute to erosion by eating young trees and young shoots of plants before they can become established, creating trails that can damage native vegetative cover, promoting erosion by destabilizing substrate and creating gullies that convey water, and by dislodging stones from ledges that can cause rockfalls and landslides and damage vegetation below (Cuddihy and Stone 1990, pp. 63–64). Nine of the described Maui Nui ecosystems (coastal, lowland dry, lowland mesic, lowland wet, montane dry, montane mesic, montane wet, dry cliff, and wet cliff) and their associated species are currently threatened by the destruction or degradation of habitat due to axis deer.

The mouflon sheep (*Ovis gmelini musimon*), native to Asia Minor, was introduced to the islands of Lanai and Hawaii in the 1950s as a managed game species, and has become widely established on these islands (Tomich 1986, pp. 163–168; Cuddihy and Stone 1990, p. 66; Hess 2008, p. 1). Mouflon have high reproduction rates; for example, the original population of 11 individuals on the island of Hawaii has increased to more than 2,500 in 36 years, even though hunted as a game animal (Hess 2008, p. 3). Mouflon only form large groups when breeding, thus limiting control techniques and hunting efficiency (Hess 2008, p. 3). Mouflon sheep are both grazers and browsers, and have decimated vast areas of native forest and shrubland through browsing and bark stripping (Stone 1985, p. 271; Cuddihy and Stone 1990, pp. 63, 66; Hess 2008, p. 3). In range studies done on the effects of mouflon grazing and browsing on the island of Hawaii, plant species found to be most affected were *Argyroxiphium sandwicense* ssp. *sandwicense* (Mauna Kea silversword), an endangered species; *Acacia koa; Geranium* spp. (hinahina); *Sophora chrysophylla; Vaccinium* spp. (ohelo); and native grasses (Giffin 1981, pp. 22–23; Scowcroft and Conrad 1992, pp. 628–662; Hess 2008, p. 3). Mouflon also create trails and pathways through thick vegetation, leading to increased runoff and erosion through soil compaction. In some areas, the interaction of browsing and soil compaction leads to a change from native rainforest to grassy scrublands (Hess 2008, p. 3). Seven of the described ecosystems (coastal, lowland dry, lowland mesic, lowland wet, montane wet, dry cliff, and wet cliff) on Lanai and their associated species are currently threatened by the destruction or degradation of habitat due to mouflon sheep.

Cattle (*Bos taurus*), the wild progenitors of which were native to Europe, northern Africa, and southwestern Asia, were introduced to the Hawaiian Islands in 1793. Large feral herds (as many as 12,000 on the island of Hawaii) developed as a result of restrictions on killing cattle decreed by King Kamehameha I (Cuddihy and Stone 1990, p. 40). While small cattle ranches were developed on Kauai, Oahu, Molokai, west Maui, and

Kahoolawe, very large ranches of tens of thousands of acres were created on east Maui and Hawaii Island (Stone 1985, pp. 256, 260; Broadbent 2010, in litt.). Logging of native *Acacia koa* was combined with establishment of cattle ranches, quickly converting native forest to grassland (Tomich 1986, p. 140; Cuddihy and Stone 1990, p. 47). Feral cattle can presently be found on the islands of Maui and Hawaii, where ranching is still a major commercial activity. According to Kessler (2011, pers. comm.), there are approximately 300 individuals roaming east Maui up to the alpine ecosystem (i.e., 1,000 to 9,900 ft (305 to 3,000 m) elevation) with occasional observations on west Maui. Cattle eat native vegetation, trample roots and seedlings, cause erosion, create disturbed areas into which alien plants invade, and spread seeds of alien plants in their feces and on their bodies. The forest in areas grazed by cattle degrades to grassland pasture, and plant cover is reduced for many years following removal of cattle from an area. In addition, several alien grasses and legumes purposely introduced for cattle forage have become noxious weeds (Tomich 1986, pp. 140–150; Cuddihy and Stone 1990, p. 29). Five of the described ecosystems (lowland dry, lowland mesic, lowland wet, montane mesic, and montane wet) on Maui and their associated species are currently threatened by the destruction or degradation of habitat due to cattle.

In summary, the 40 species proposed or reevaluated for listing and that are dependent upon the 10 ecosystems identified in this proposed rule (coastal, lowland dry, lowland mesic, lowland wet, montane dry, montane mesic, montane wet, subalpine, dry cliff, and wet cliff) are exposed to both direct and indirect negative impacts of feral ungulates (pigs, goats, axis deer, mouflon, and cattle). These negative impacts result in the destruction and degradation of habitat for the native species on Molokai, Lanai, and Maui. The effects of these nonnative animals include the destruction of vegetative cover; trampling of plants and seedlings; direct consumption of native vegetation; soil disturbance; dispersal of alien plant seeds on hooves and coats, and through the spread of seeds in feces; and creation of open disturbed areas conducive to further invasion by nonnative pest plant species. All of these impacts lead to the subsequent conversion of a plant community dominated by native species to one dominated by nonnative species (see ''Habitat Destruction and Modification by Nonnative Plants,'' below). In addition, because these mammals inhabit terrain that is often steep and remote (Cuddihy and Stone 1990, p. 59), foraging and trampling contributes to severe erosion of watersheds and degradation of streams. As early as 1900, there was increasing concern expressed about the integrity of island watersheds, due to effects of ungulates and other factors, leading to the establishment of a professional forestry program emphasizing soil and water conservation (Nelson 1989, p. 3).

Habitat Destruction and Modification by Nonnative Plants

Native vegetation on all of the main Hawaiian Islands has undergone extreme alteration because of past and present land management practices, including ranching, the deliberate introduction of nonnative plants and animals, and agricultural development (Cuddihy and Stone 1990, pp. 27, 58). The original native flora of Hawaii (species that were present before humans arrived) consisted of about 1,000 taxa, 89 percent of which were endemic (species that occur only in the Hawaiian Islands). Over 800 plant taxa have been introduced from elsewhere, and nearly 100 of these have become pests (e.g., injurious plants) in Hawaii (Smith 1985, p. 180; Cuddihy and Stone 1990, p. 73; Gagne and Cuddihy 1999, p. 45). Of these 100 nonnative pest plant species, close to 70 species have altered the habitat of 36 of the 40 species proposed or reevaluated for listing (only *Cyrtandra ferripilosa, Schiedea jacobii, Partulina semicarinata,* and *P. variabilis* are not directly impacted by nonnative plants; see Table 3). Some of the nonnative plants were brought to Hawaii by various groups of people, including the Polynesians, for food or cultural reasons. Plantation owners (and the territorial government of Hawaii), alarmed at the reduction of water resources for their crops caused by the destruction of native forest cover by grazing feral and domestic animals, introduced nonnative trees for reforestation. Ranchers intentionally introduced pasture grasses and other nonnative plants for agriculture, and sometimes inadvertently introduced weeds as well. Other plants were brought to Hawaii for their potential horticultural value (Scott *et al.* 1986, pp. 361–363; Cuddihy and Stone 1990, p. 73).

Nonnative plants adversely impact native habitat in Hawaii, including the 10 Maui Nui ecosystems that support the 40 species proposed or reevaluated for listing, and directly adversely impact 36 of these 40 species, by: (1) Modifying the availability of light; (2) altering soil-water regimes; (3) modifying nutrient cycling; (4) altering the fire regime affecting native plant communities (e.g., successive fires that burn farther and farther into native habitat, destroying native plants and removing habitat for native species by altering microclimatic conditions to favor alien species); and (5) ultimately, converting native-dominated plant communities to nonnative plant communities (Smith 1985, pp. 180–181; Cuddihy and Stone 1990, p. 74; D'Antonio and Vitousek 1992, p. 73; Vitousek *et al.* 1997, p. 6). Below, we have organized a list of nonnative plants by their ecosystems followed by a discussion of the specific negative effects of those nonnative plants on the species proposed or reevaluated for listing here.

Nonnative Plants in the Coastal Ecosystem

Nonnative plant species that threaten *Pittosporum halophilum* and *Canavalia pubescens,* the two species proposed for listing in this rule that inhabit the coastal ecosystem on Molokai and Lanai, include the understory and subcanopy species *Cenchrus ciliaris* (buffelgrass), *Kalanchoe pinnata* (air plant), *Lantana camara* (lantana), *Leucaena leucocephala* (koa haole), and *Pluchea carolinensis* (sourbush) (HBMP 2008). Nonnative canopy species that threaten the two species proposed for listing include *Acacia farnesiana* (klu) and *Prosopis pallida* (kiawe) (HBMP 2008). These nonnative plant species pose serious and ongoing threats to the two species proposed for listing that depend on this ecosystem (see ''Specific Nonnative Plant Species Impacts,'' below).

Nonnative Plants in the Lowland Dry Ecosystem

Nonnative plant species that threaten the six species (*Bidens campylotheca* ssp. *pentamera, Canavalia pubescens, Cyanea obtusa, Pleomele fernaldii, Santalum haleakalae* var. *lanaiense,* and *Schiedea salicaria*) proposed or reevaluated for listing in this rule that inhabit the lowland dry ecosystem on Lanai and Maui include the understory and subcanopy species *Ageratina adenophora* (Maui pamakani), *Leucaena leucocephala,* and *Neonotonia wightii* (glycine) (HBMP 2008). Nonnative canopy species that threaten the six species proposed or reevaluated for listing include *Acacia farnesiana, Prosopis pallida,* and *Schinus terebinthifolius* (christmasberry) (HBMP 2008). In addition, the six species proposed or reevaluated for listing are threatened by the nonnative grasses *Andropogon virginicus* (broomsedge),

Cenchrus ciliaris, and *Melinis repens* (natal redtop) (HBMP 2008). See ''Specific Nonnative Plant Species Impacts'' (below) for specific threats each of these nonnative plant species pose to the six species proposed or reevaluated for listing that depend on this ecosystem.

Nonnative Plants in the Lowland Mesic Ecosystem

Nonnative plant species that threaten the 11 species (*Bidens campylotheca* ssp. *pentamera, Cyanea asplenifolia, Cyanea profuga, Cyanea solanacea, Cyrtandra filipes, Festuca molokaiensis, Phyllostegia haliakalae, Phyllostegia pilosa, Pleomele fernaldii, Santalum haleakalae* var. *lanaiense,* and *Schiedea salicaria*) proposed or reevaluated for listing in this rule that inhabit the lowland mesic ecosystem on Molokai, Lanai, and Maui include the understory and subcanopy species *Clidemia hirta* (Koster's curse), *Erigeron karvinskianus* (daisy fleabane), *Lantana camara, Leptospermum scoparium* (tea tree), *Rubus rosifolius* (thimbleberry), and *Cyathea cooperi* (Australian tree fern) (HBMP 2008). Nonnative canopy species that threaten the 11 species proposed or reevaluated for listing include *Coffea arabica* (Arabian coffee), *Psidium cattleianum, Schinus terebinthifolius,* and *Szygium cumini* (java plum) (HBMP 2008). An additional species that threatens the 11 species proposed or reevaluated for listing is the nonnative grass *Paspalum conjugatum* (Hilo grass) (HBMP 2008). These nonnative plant species pose serious and ongoing threats (see ''Specific Nonnative Plant Species Impacts,'' below) to all 11 of the species proposed or reevaluated for listing that depend on this ecosystem.

Nonnative Plants in the Lowland Wet Ecosystem

Nonnative plant species that threaten the 15 plant species (*Bidens campylotheca waihoiensis, B. conjuncta, Cyanea asplenifolia, C. duvalliorum, C. grimesiana* ssp. *grimesiana, C. kunthiana, C. magnicalyx, C. maritae, C. solanacea, Cyrtandra filipes, Mucuna sloanei* var. *persericea, Phyllostegia bracteata, Pleomele fernaldii, Santalum haleakalae* var. *lanaiense,* and *Wikstroemia villosa*), and the tree snail species *Newcombia cumingi* proposed or reevaluated for listing in this rule that inhabit the lowland wet ecosystem on Molokai, Lanai, and Maui include the understory and subcanopy species *Ageratina adenophora, Ageratina riparia* (Hamakua pamakani), *Blechnum appendiculatum, Buddleia asiatica* (dog tail), *Chrysophyllum oliviforme* (satinleaf), *Cinchona pubescens* (quinine), *Cinnamomum burmannii* (padang cassia), *Clidemia hirta, Coffea arabica, Cordyline fruticosa, Cortaderia jubata* (pampas grass), *Juncus planifolius, Leptospermum scoparium, Melastoma* sp., *Rubus rosifolius,* and *Tibouchina herbacea* (glorybush) (Maui Land and Pineapple Co. (MLP) 2005, p. 11; HBMP 2008; TNCH 2009a, pp. 1–14; East Maui Watershed Partnership (EMWP) 2009, pp. 29–30). Nonnative canopy species that threaten the 16 species proposed or reevaluated for listing include *Aleurites moluccana* (kukui), *Eucalyptus* spp. (gum tree), *Fraxinus uhdei* (tropical ash), *Miconia calvescens* (miconia), *Psidium cattleianum,* and *Psidium guajava* (HBMP 2008). Nonnative grasses that threaten this ecosystem are *Axonopus fissifolius* (carpetgrass), *Oplismenus hirtellus* (basketgrass), and *Paspalum conjugatum* (HBMP 2008). These nonnative plant species pose serious and ongoing threats to 16 of the species proposed or reevaluated for listing that depend on this ecosystem (see ''Specific Nonnative Plant Species Impacts,'' below).

Nonnative Plants in the Montane Dry Ecosystem

Nonnative plant species that threaten the species *Santalum haleakalae* var. *lanaiense* in the montane dry ecosystem on Maui include the understory and subcanopy species *Clidemia hirta, Leptospermum scoparium, Tibouchina herbacea,* and *Rubus argutus* (Harbaugh *et al.* 2010, p. 827). Nonnative canopy species that threaten *Santalum haleakalae* var. *lanaiense* include *Fraxinus uhdei, Grevillea robusta* (haikukeokeo, silver oak), *Morella faya* (firetree), *Psidium cattleianum,* and *Schinus terebinthifolius* (Harbaugh *et al.* 2010, p. 827). Nonnative mat-forming grasses such as *Melinis minutiflora* threaten *Santalum haleakalae* var. *lanaiense* in the montane dry ecosystem (Harbaugh *et al.* 2010, p. 827). These nonnative plant species pose serious and ongoing threats to the plant *S. haleakalae* var. *lanaiense,* which is reevaluated for listing and inhabits the montane dry ecosystem (see ''Specific Nonnative Plant Species Impacts,'' below).

Nonnative Plants in the Montane Mesic Ecosystem

Nonnative plant species that threaten the 12 species (*Bidens campylotheca* ssp. *pentamera, Cyanea horrida, C. kunthiana, C. magnicalyx, C. obtusa, C. solanacea, Cyrtandra oxybapha, Geranium hillebrandii, Phyllostegia bracteata, Santalum haleakalae* var. *lanaiense, Stenogyne kauaulaensis,* and *Wikstroemia villosa*) proposed or reevaluated for listing in this rule that inhabit the montane mesic ecosystem on Molokai and Maui include the understory and subcanopy species *Ageratina adenophora, Buddleia asiatica, Cestrum diurnum, Cortaderia jubata, Lantana camara, Rubus argutus* (prickly Florida blackberry), and *Rubus rosifolius* (Leeward Haleakala Watershed Restoration Partnership (LHWRP) 2006, p. 25; HBMP 2008; TNCH 2009a, pp. 1–14). Canopy species that threaten the 12 species proposed or reevaluated for listing include *Eucalyptus* spp., *Fraxinus uhdei, Morella faya, Pinus* spp., *Psidium cattleianum,* and *Schinus terebinthifolius* (HBMP 2008). Nonnative grasses that threaten this ecosystem are *Andropogon virginicus* (broomsedge), *Holcus lanatus, Melinis minutiflora,* and *Paspalum conjugatum* (HBMP 2008). These nonnative plant species pose serious and ongoing threats (see ''Specific Nonnative Plant Species Impacts,'' below) to 12 of the species proposed or reevaluated for listing that depend on this ecosystem.

Nonnative Plants in the Montane Wet Ecosystem

Nonnative plant species that threaten the 20 plant species (*Bidens campylotheca* ssp. *pentamera, B. campylotheca* ssp. *waihoiensis, B. conjuncta, Calamagrostis hillebrandii, Cyanea duvalliorum, C. horrida, C. kunthiana, C. maritae, C. profuga, C. solanacea, Cyrtandra oxybapha, Geranium hanaense, G. hillebrandii, Myrsine vaccinioides, Peperomia subpetiolata, Phyllostegia bracteata, P. pilosa, Santalum haleakalae* var. *lanaiense, Schiedea laui,* and *Wikstroemia villosa*) proposed or reevaluated for listing in this rule that inhabit the montane wet ecosystem on Molokai and Maui include the understory and subcanopy species *Ageratina adenophora, Ageratina riparia, Ageratum conyzoides* (maile honohono), *Buddleia asiatica, Cestrum nocturnum* (night cestrum), *Christella dentata, Chrysophyllum oliviforme, Cinchona pubescens, Cinnamomum burmannii, Clidemia hirta, Conyza bonariensis* (hairy horseweed), *Cortaderia jubata, Cuphea carthagenensis* (tarweed), *Drymaria cordata* (chickweed), *Erechtites valeranifolia* (fireweed), *Erigeron karvinskianus, Hedychium gardnerianum* (kahili ginger), *Hypochoeris radicata* (hairy cat's ear), *Juncus* spp., *Lantana camara, Rubus* spp., *Cyathea cooperi,*

Tibouchina herbacea, Ulex europaeus (gorse), and *Youngia japonica* (oriental hawksbeard) (MLP 2005, p. 11; HBMP 2008; TNCH 2009a, pp. 1–14; EMoWP 2010, pp. 5–6). Nonnative canopy species that threaten the 20 species proposed or reevaluated for listing include *Eucalyptus* spp., *Fraxinus uhdei, Morella faya, Psidium cattleianum,* and *Schinus terebinthifolius* (HBMP 2008). Nonnative grasses that threaten this ecosystem are *Axonopus fissifolius, Holcus lanatus* (common velvetgrass), *Melinis minutiflora* (molasses grass), *Paspalum conjugatum, Sacciolepis indica* (glenwood grass), and *Setaria palmifolia* (palmgrass) (HBMP 2008). These nonnative plant species pose serious and ongoing threats to the 20 species proposed or reevaluated for listing that depend on this ecosystem (see ''Specific Nonnative Plant Species Impacts,'' below).

Nonnative Plants in the Subalpine Ecosystem

Nonnative plant species that threaten *Phyllostegia bracteata,* the only species proposed for listing in this rule that inhabits the subalpine ecosystem (Maui), include the understory and subcanopy species *Cotoneaster pannosus* (silver-leaf cotoneaster), *Epilobium billardierianum* (willow herb), *Passiflora tarmaniana,* and *Rubus* spp. (Oppenheimer 2010n, in litt.). Nonnative canopy species that threaten *P. bracteata* include *Cryptomeria japonica* (tsugi pine) and *Pinus* spp. Nonnative grasses that are a threat to this ecosystem include *Anthoxanthum odoratum* (sweet vernalgrass) and *Dactylis glomerata* (cocksfoot) (HBMP 2008). These nonnative plant species pose serious and ongoing threats (see ''Specific Nonnative Plant Species Impacts,'' below) to the plant *P. bracteata,* which is proposed for listing and inhabits this ecosystem.

Nonnative Plants in the Dry Cliff Ecosystem

Nonnative plant species that threaten the three species (*Bidens campylotheca* ssp. *pentamera, Phyllostegia haliakalae,* and *Pleomele fernaldii*) proposed for listing in this rule that inhabit the dry cliff ecosystem on Lanai and Maui include the understory and subcanopy species *Ageratina adenophora, Hypochoeris radicata, Lapsana communis* (nipplewort), *Lythrum maritimum* (loosestrife), *Prunella vulgaris,* and *Rubus* spp. (HBMP 2008). Nonnative grasses that threaten this ecosystem include *Andropogon virginicus, Anthoxantum odoratum, Dactylis glomerata, and Holcus lanatus* (HBMP 2008). These nonnative plant species pose serious and ongoing threats to all three of the species proposed for listing that depend on this ecosystem (see ''Specific Nonnative Plant Species Impacts,'' below).

Nonnative Plants in the Wet Cliff Ecosystem

Nonnative plant threats to the 12 plant species (*Bidens campylotheca* ssp. *pentamera, B. campylotheca* ssp. *waihoiensis, B. conjuncta, Cyanea grimesiana* ssp. *grimesiana, C. horrida, C. magnicalyx, C. munroi, Cyrtandra filipes, Phyllostegia bracteata, P. haliakalae, Pleomele fernaldii,* and *Santalum haleakalae* var. *lanaiense*) proposed or reevaluated for listing in this rule that inhabit the wet cliff ecosystem on Molokai, Lanai, and Maui include the understory and subcanopy species *Ageratina adenophora, Buddleia asiatica, Juncus planifolius, Rubus rosifolius,* and *Tibouchina herbacea* (HBMP 2008). The 12 species proposed or reevaluated for listing are also threatened by the nonnative canopy species *Ardisia elliptica* (shoebutton ardisia) and the nonnative grass *Oplismenus hirtellus* (HBMP 2008). These nonnative plant species pose serious and ongoing threats to 12 of the species proposed or reevaluated for listing that depend on this ecosystem (see ''Specific Nonnative Plant Species Impacts,'' below).

Specific Nonnative Plant Species Impacts

Nonnative plants pose serious and ongoing threats to 36 of the 40 species proposed or reevaluated for listing in this proposed rule throughout their ranges by destroying and modifying habitat. They can adversely impact microhabitat by modifying the availability of light and nutrient cycling processes, and altering soil-water regimes. They can also alter fire regimes affecting native plant habitat, leading to incursions of fire-tolerant nonnative plant species into native habitat. Nonnative plants outcompete native plants by growing faster, and some may release chemicals that inhibit the growth of other plants. These competitive advantages allow nonnative plants to convert native-dominated plant communities to nonnative plant communities (Cuddihy and Stone 1990, p. 74; Vitousek 1992, pp. 33–35). The following list provides a brief description of the nonnative plants that pose a threat to 36 of the 40 species proposed or reevaluated for listing here. The Hawaii-Pacific Weed Risk Assessment is cited in many of the brief descriptions of the nonnative plants below. This assessment was created as a research collaboration between the University of Hawaii and the U.S. Forest Service for use in Hawaii and other high Pacific islands (i.e., volcanic in origin, as opposed to low-lying atolls), and is an adaptation of the Australian/New Zealand Weed Risk Assessment protocol developed in the 1990s (Denslow and Daehler 2004, p. 1). The Australian/New Zealand protocol was developed to screen plants proposed for introduction into those countries, while the Hawaii-Pacific Weed Risk Assessment was developed to evaluate species already used in landscaping, gardening, and forestry, and is used to predict whether or not a nonnative plant species is likely to become invasive. Not all nonnative plant species present in Hawaii have been assessed, and information on species invasiveness is lacking or absent from some of the descriptions below. In general, all nonnative plant species displace native Hawaiian plants; here we describe other specific negative impacts of individual alien plant species when known.

- *Acacia farnesiana* (klu) is a shrub up to 13 ft (4 m) tall, native to the Neotropics, and formerly cultivated in Hawaii for an attempted perfume industry. It is now naturalized (i.e., initially introduced by artificial means from another area, and now established and reproducing in the wild) and common on all of the main islands except Niihau (Geesink *et al.* 1999, p. 641). *Acacia farnesiana* is thorny and forms dense thickets, and regenerates quickly after fire. The seeds are dispersed by ungulates that eat the pods (Pacific Island Ecosystems at Risk (PIER) 2011a). According to the Hawaii Weed Risk Assessment for *A. farnesiana,* this species has a high risk of invasiveness or a high risk of becoming a serious pest (PIER 2011a).
- *Ageratina adenophora* (Maui pamakani) is native to tropical America, and has naturalized in dry to wet forest on the islands of Oahu, Molokai, Lanai, and Maui (Wagner *et al.* 1999m, pp. 254–255). *Ageratina adenophora* is a shrub 3 to 5 ft (1 to 1.5 m) tall with trailing branches that root on contact with soil. It forms dense mats, which prevent regeneration of native plants (Anderson *et al.* 1992, p. 315). It is considered a serious weed in agriculture, especially in rangeland, because it often replaces more desirable vegetation or native species, and is fatally toxic to horses and most livestock. The eupatorium gall fly, *Procecidochares utilis,* was introduced to Hawaii in 1944, for control of Maui pamakani, and has been successful in suppression of some of the infestations

of this invasive nonnative plant (Bess and Haramoto 1959, p. 248).

• *Ageratina riparia* (Hamakua pamakani) is a subshrub that spreads from a creeping rootstock (Wagner *et al.* 1999m, p. 255). This species forms dense mats, preventing regeneration of native plants (Davis *et al.* 1992, p. 427).

• *Ageratum conyzoides* (maile honohono) is a perennial herb, native to Central and South America, and now widespread in Hawaii (Wagner *et al.* 1999m, pp. 254–255). This ephemeral herb is found in disturbed areas, tolerates shade, and can displace native plants. It produces many thousands of seeds, which spread by wind and water, with over half the seeds germinating shortly after they are shed (PIER 2007).

• *Aleurites moluccana* (kukui) is a spreading, tall tree native to the Malesian region, and considered a Polynesian introduction to Hawaii. It is now a significant component of the mesic valley vegetation from sea level to 2,300 ft (700 m) on all the main islands (Wagner *et al.* 1999n, p. 598). According to the Hawaii Weed Risk Assessment for *A. moluccana,* this species has a high risk of invasiveness or a high risk of becoming a serious pest (PIER 2008a). The species tolerates a wide range of soil conditions and forms dense thickets, which increases its competitive abilities over native plants.

• *Andropogon virginicus* (broomsedge) is a perennial bunchgrass native to northeastern America, now naturalized on Kauai, Oahu, Molokai, Maui and Hawaii, along roadsides and in disturbed dry to mesic forest and shrubland (O'Connor 1999, p. 1,497). Seeds are easily distributed by wind, clothing, vehicles, and feral animals (Smith 1989, pp. 60–69). *Andropogon virginicus* may release allelopathic substances that dramatically decrease native plant reestablishment (Rice 1972, pp. i, 752–755). This species has become dominant in areas subjected to natural or human-induced fires (Mueller-Dombois 1972, pp. 1–2). *Andropogon virginicus* is on the Hawaii State noxious weed list (Hawaii Administrative Rules (H.A.R.) Title 4, Subtitle 6, Chapter 68).

• *Anthoxanthum odoratum* (sweet vernalgrass) is a perennial bunchgrass native to Eurasia, now naturalized on Kauai, Molokai, Maui, and Hawaii, in pastures, disturbed areas in wet forest, and sometimes subalpine shrubland (O'Connor 1999, p. 1,498). This species forms extensive ground cover, and invades disturbed areas, preventing the reestablishment of native plant species (PIER 2008b).

• *Ardisia elliptica* (shoebutton ardisia) is a branched shrub native to Sri Lanka that is now naturalized in Hawaii (Wagner *et al.* 1999f, pp. 932–933). This species is shade-tolerant and can rapidly form dense, monotypic stands, preventing establishment of other species (Global Invasive Species Database (GISD) 2005). Its fruit are attractive to birds, which then spread the seeds over the landscape. According to the Hawaii Weed Risk Assessment for *A. elliptica,* this species has a high risk of invasiveness or a high risk of becoming a serious pest (PIER 2008c).

• *Axonopus fissifolius* (carpetgrass) is a pasture grass that forms dense mats with tall foliage. This species does well in soils with low nitrogen levels, and can outcompete other grasses in wet forests and bogs. The species is not subject to any major diseases or insect pests, and recovers quickly from fire. The seeds are readily spread by water, vehicles, and grazing animals (O'Connor 1999, pp. 1,500–1,502; Cook *et al.* 2005, p. 4).

• *Blechnum appendiculatum* (NCN) is a fern with fronds to 23 in (60 cm) long that forms large colonies, outcompeting many native fern species (Palmer 2003, p. 81).

• *Buddleia asiatica* (dog tail) is a shrub or small tree that can tolerate a wide range of habitats, forms dense thickets, and is rapidly spreading into wet forest and lava and cinder substrate areas in Hawaii, displacing native vegetation (Wagner *et al.* 1999o, p. 415; PIER 2008d).

• *Cenchrus ciliaris* (buffelgrass) is native to Africa and tropical Asia and is naturalized in Hawaii (O'Connor 1999, p. 1,512). It is a fire-adapted grass that provides fuel for fires and recovers quickly, increasing its cover with each succeeding fire (PIER 2008e), thereby displacing native plants and altering natural fire regimes.

• *Cestrum diurnum* (day cestrum) is an approximately 6.6-ft (2-m) tall shrub native to the West Indies, cultivated for its fragrant flowers, and is now naturalized on Kauai, Oahu, and Molokai (Symon 1999, p. 1,254). This species invades dry and wet areas and forms dense thickets. Seeds are dispersed by birds; however the seeds are poisonous to humans and other mammals (Florida Exotic Pest Plant Council (FEPC) 2011).

• *Cestrum nocturnum* (night cestrum), a shrub or small tree native to the Antilles and Central America, was cultivated in Hawaii prior to 1871 (Symon 1999, pp. 1,254–1,255). It forms dense, impenetrable thickets in wet forest and open areas. According to the Hawaii Weed Risk assessment, this species has a high risk of invasiveness or a high risk of becoming a serious pest (PIER 2010a).

• *Christella dentata* (NCN) is a medium-sized fern widely distributed in the tropics and subtropics of the Old World, now widespread as a weed in the Americas. In Hawaii, this species is most common in disturbed mesic habitats, but also occurs in varied habitats including undisturbed sites on all major islands. *Christella dentata* hybridizes with the endemic species *C. cyatheoides,* forming extensive clones of the sterile hybrid (Palmer 2003, pp. 88–90).

• *Chrysophyllum oliviforme* (satinleaf) is a small tree native to the United States (Florida), West Indies, and Central America, and is naturalized in Hawaii (Pennington 1999, p. 1,231; PIER 2006). Birds easily disperse the fleshy fruit, and the species can become a dominant component in forest habitat (Pennington 1999, p. 1,231; MLP 2002, pp. A1–A4). According to the Hawaii Weed Risk Assessment for *C. oliviforme,* this species has a high risk of invasiveness or a high risk of becoming a serious pest (PIER 2006).

• *Cinchona pubescens* (quinine) is a tree that is 13 to 33 ft (4 to 10 m) tall with a dense canopy. It is native to Central and South America, and is widely cultivated for quinine. A small plantation was started on Maui in 1868, and this species was planted by State foresters on Oahu, Maui, and Hawaii between 1928 and 1947 (Wagner *et al.* 1999a, p. 1,120). It reproduces with wind-dispersed seeds and also vegetatively via multiple suckers up to several meters away from the adult tree and aggressively replaces and shades out native vegetation (GISD 2011).

• *Cinnamomum burmannii* (padang cassia), a tree native to Indonesia, is cultivated and now naturalized on Oahu, Maui, Lanai, and Hawaii (van der Werff 1999, p. 846). Seeds are bird-dispersed (Starr *et al.* 2003). On Maui, this species is included in the weed control program at Puu Kukui Preserve, as it can become a dominant component in forest habitat (MLP 2002, p. 20).

• *Clidemia hirta* (Koster's curse), a noxious shrub in the Melastoma family, forms a dense understory, shades out native plants, and prevents their regeneration (Wagner *et al.* 1985, p. 41; Smith 1989, p. 64). All plants in the Melastoma family are on the Hawaii State noxious weed list (H.A.R. Title 4, Subtitle 6, Chapter 68).

• *Coffea arabica* (Arabian coffee) is a shrub or tree up to 16.5 ft (5 m) tall, native to Ethiopia, and widely cultivated in Hawaii as a commercial crop. It was naturalized in Hawaii by the mid-1800s in mesic to wet disturbed

sites, usually in valleys or along streambeds (Wagner *et al.* 1999a, pp. 1,120–1,121). This species is shade tolerant, and can form dense stands in the forest understory, displacing and shading out native plants. The seeds are dispersed by birds and rats (PIER 2008f).

• *Conyza bonariensis* (hairy horseweed) is an annual herb common in various urban and nonurban areas in Hawaii, generally in relatively dry habitats, sometimes in disturbed mesic to wet forest, on Kure Atoll, Midway Atoll, Laysan, French Frigate Shoals, and all of the main islands (Wagner *et al.* 1999m, p. 288), where it displaces native plants.

• *Cordyline fruticosa* (ki, ti), a shrub that is 6.6 to 11.5 ft (2 to 3.5 m) tall, is considered a Polynesian introduction to Hawaii. It was extensively cultivated and occurs widely in mesic valleys and forests (Wagner *et al.* 1999i, pp. 1,348–1,350). It can become a dominant element of the understory (Department of Land and Natural Resources (DLNR) 1989).

• *Cortaderia jubata* (pampas grass), a large, clump-forming, perennial herb, was first discovered in 1987, on east Maui, where it has escaped cultivation and is becoming invasive on the slopes of Haleakala. This species is a serious pest in California, and is on the Hawaii State noxious weed list (Staples and Herbst 2005, p. 744). *Cortaderia jubata* produces abundant seed and spreads readily (Staples and Herbst 2005, p. 744).

• *Cotoneaster pannosus* (silver-leaf cotoneaster) is a shrub native to China that is occasionally cultivated (Volcano, Hawaii Island and Kula, Maui) in Hawaii (Wagner *et al.* 1999p, p. 1,100). Previously thought to be contained within the vicinity of cultivated plants, this species has become a threat to native forest (Oppenheimer 2010n, in litt.). The attractive, bird-dispersed fruits of this species, aggressive root systems, and tendency of all cotoneasters to shade and smother sun-loving, native plants contribute to the invasiveness of this species (PIER 2010b).

• *Cryptomeria japonica* (Japanese cedar, Tsugi) is a pyramidal, evergreen tree native to China and Japan, which is 50 to 60 ft (15 to 18 m) tall and has dense foliage (North Carolina State University 2006; University of Connecticut 2006). *Cryptomeria japonica* has life-history traits of an invasive species, including small seed mass, short juvenile period, and short intervals between large seed crops (Richardson and Rejmanek 2004, p. 321).

• *Cuphea carthagenensis* (tarweed) is an annual or short-lived perennial herb naturalized in mesic to wet disturbed sites on Kauai, Oahu, Molokai, Maui, and Hawaii (Wagner *et al.* 1999q, p. 866). This species was also recently documented on Lanai (PIER 2010c). *Cuphea carthagenensis* forms dense, shrubby mats that displace or prevent the establishment of native forest species (Hawaii National Park 1959, p. 7; Wagner *et al.* 1999q, p. 866).

• *Cyathea cooperi* (Australian tree fern) is a tree fern native to Australia that was brought to Hawaii for use in landscaping (Medeiros *et al.* 1992, p. 27). It can achieve high densities in native Hawaiian forests, grows up to 1 ft (0.3 m) in height per year (Jones and Clemesha 1976, p. 56), and can displace native species. Understory disturbance by feral pigs facilitates the establishment of this species (Medeiros *et al.* 1992, p. 30), and it has been known to spread over 7 mi (12 km) through windblown dispersal of spores from plant nurseries (Medeiros *et al.* 1992, p. 29).

• *Dactylis glomerata* (cocksfoot) is a tufted, perennial grass native to Europe that is widely cultivated and naturalized in Hawaii, now abundant in pastures and along trails and roadsides on Kauai, Oahu, Molokai, Maui, and Hawaii (O'Connor 1999, pp. 1,520–1,521). This species becomes established in disturbed sites and forms dense swards that suppress native grasses and herbaceous species (PIER 2010d).

• *Drymaria cordata* (chickweed) is a straggling herb naturalized in shaded, moist sites including native montane wet habitat on Kauai, Oahu, Molokai, Maui, and Hawaii (Wagner *et al.* 1999j, p. 505). While seldom a weed of cultivated areas, it is known to invade plantation crops such as tea and coffee, as well as pastures, lawns, gardens, riverbanks, ditches, and even sandbars in rivers (PIER 2010e). *Drymaria cordata* can displace or prevent the establishment of native understory and subcanopy plants.

• *Epilobium billardierianum* (willow herb) is a perennial herb naturalized in open sites in wet forest to disturbed grassland, especially on open lava, in pastures, and along roadsides on Kauai, Oahu, Maui, and Hawaii (Wagner *et al.* 1999r, p. 995). *Epilobium billardierianum* dominates subalpine areas on Maui (Anderson *et al.* 1992, p. 328).

• *Erechtites valerianifolia* (fireweed) is a tall (up to 8 ft (2.5 m)), widely distributed, annual herb that produces thousands of wind-dispersed seeds, and outcompetes native plants (Wagner *et al.* 1999m, p. 314).

• *Erigeron karvinskianus* (daisy fleabane) reproduces and spreads rapidly by stem layering and regrowth of broken roots to form dense mats. This species crowds out and displaces ground level plants (Weeds of Blue Mountains Bushland 2008).

• *Eucalyptus* spp. (gum tree) are tall trees or shrubs, and almost all of the more than 600 species are native to Australia. In the past, over 90 species and thousands of individuals were planted by Hawaii State foresters on all the main Hawaiian Islands except Niihau and Kahoolawe in an attempt to protect watersheds (Cuddihy and Stone 1990, p. 51; Chippendale 1999, p. 949). Approximately 30 species are reported to be spreading beyond the forestry plantings. Three of these species represent the greatest threat to native habitat in Hawaii, including *E. grandis* (flooded gum), *E. paniculata* (gray ironbark), and *E. saligna* (Sydney blue gum), and were the principal species used for reforestation (Chippendale 1999, p. 958). *Eucalyptus* trees are quick-growing, can reach 180 ft (55 m) in height, reproduce from wind-dispersed seeds, and outcompete and replace native forest species (PIER 2011b). According to the Hawaii Weed Risk Assessment for *Eucalyptus,* these species have a high risk of invasiveness or a high risk of becoming a serious pest (PIER 2011b).

• *Fraxinus uhdei* (tropical ash) is a tree up to 79 ft (24 m) tall, which is native to central and southern Mexico. In Hawaii, over 300,000 trees were planted by State foresters on all the main islands from 1924 to 1960 (Wagner *et al.* 1999s, p. 991). *Fraxinus uhdei* reproduces by wind-dispersed seed. This species is considered a serious threat to the mesic native *Acacia-Metrosideros* (koa-ohia) forests at Waikamoi, on east Maui (TNC 2006l, p. A5). It spreads rapidly along watercourses and forms dense, monotypic stands (Holt 1992, pp. 525–535).

• *Grevillea robusta* (silk oak) is a large evergreen tree, 26 to 98 ft (8 to 20 m) tall, native to Australia. Over two million trees were planted in Hawaii between 1919 and 1959 in an effort to reduce erosion and to provide timber. *Grevillea robusta* is aggressive, is drought-tolerant, and forms dense, monotypic stands (Santos *et al.* 1992, p. 342). The leaves produce an allelopathic substance that inhibits the establishment of all species, including itself (Smith 1985, p. 191).

• *Hedychium gardnerianum* (kahili ginger) is native to India (Nagata 1999, p. 1,623). This showy ginger was introduced for ornamental purposes,

and was first collected in 1954, at Hawaii Volcanoes National Park (Wester 1992, pp. 99–154). Kahili ginger grows over 3.3 ft (1 m) tall in open light environments; however it will readily grow in full shade beneath a forest canopy (Smith 1985, pp. 191–192). It forms vast, dense colonies, displacing other plant species, and reproduces by rhizomes where already established. The conspicuous, fleshy, red seeds are dispersed by fruit-eating birds as well as humans. Ginger reduces the amount of nitrogen in the *Metrosideros* forest canopy in Hawaii (Asner and Vitousek 2005, in litt.). It may also block stream edges, altering water flow (GISD 2007).

• *Holcus lanatus* (common velvetgrass), native to Europe, is naturalized in Hawaii and occurs on poor, moist soils (O'Connor 1999, p. 1,151). Velvetgrass is an aggressive weed, growing rapidly from basal shoots or prolific seed, and therefore can become dominant if not controlled (Smith 1985, p. 192). Velvetgrass gradually forces other plants out, reducing species diversity. Allelopathy may also play a role in the dominance of velvetgrass over other grasses (Remison and Snaydon in Pitcher and Russo 2005, p. 2).

• *Hypochoeris radicata* (hairy cat's ear) is a perennial herb up to 2 ft (0.6 m) tall, native to Eurasia. In Hawaii, it is naturalized in wet and dry disturbed sites on all the main islands (Wagner *et al.* 1999m, p. 327). It has a deep, succulent taproot favored by feral pigs, which dig up large areas searching for the roots (Smith 1985, p. 192). Seeds are produced in large numbers and dispersed by wind. It regenerates rapidly from the crown of the taproot after fire (Smith 1985, p. 192).

• *Juncus effusus* (Japanese mat rush) is a perennial herb widely distributed in temperate regions and naturalized in Hawaii in ponds, streams, and open boggy sites. It was brought to Hawaii as a source of matting material, but grew too slowly to be of commercial value (Coffey 1999, p. 1,453). This plant spreads by seeds and rhizomes, and forms dense mats that crowd out native plants (United States Department of Agriculture—Agricultural Research Division—National Genetic Resources Program (USDA–ARS–NGRP) 2011).

• *Juncus ensifolius* (dagger-leaved rush), a perennial herb native to the western United States, is naturalized in Hawaii and occurs in standing water of marshy areas (Coffey 1999, p. 1,453). This weedy colonizer can tolerate environmental stress and outcompete native species (Pojar and MacKinnon 1994).

• *Juncus planifolius* (bog rush) is a perennial herb that is naturalized on Kauai, Oahu, Molokai, Maui, and Hawaii, in moist, open, disturbed depressions on margins of forests and in bogs (Coffey 1999, pp. 1,453–1,454). This species forms dense mats and has the potential to displace native plants by preventing establishment of native seedlings (Medeiros *et al.* 1991, pp. 22–23).

• *Kalanchoe pinnata* (air plant), a perennial herb, is widely established in many tropical and subtropical areas. In Hawaii, it was naturalized prior to 1871, and is abundant in low-elevation, disturbed areas on all the main islands except Niihau and Kahoolawe (Wagner *et al.* 1999t, p. 568). The air plant can reproduce vegetatively at indents along the leaf, usually after the leaf has broken off the plant and is lying on the ground, where a new plant can take root (Motooka *et al.* 2003a). *Kalanchoe pinnata* can form dense stands that prevent reproduction of native species (Motooka *et al.* 2003a; Randall 2007—*Global Compendium of Weeds Database*).

• *Lantana camara* (lantana), a malodorous, branched shrub up to 10 ft (3 m) tall, was brought to Hawaii as an ornamental plant. Lantana is aggressive and thorny, and forms thickets, crowding out and preventing the establishment of native plants (Davis *et al.* 1992, p. 412; Wagner *et al.* 1999u, p. 1,320).

• *Lapsana communis* (nipplewort) is an annual herb naturalized in relatively wet, disturbed areas such as disturbed wet forest, between elevations of 3,117 to 10,597 ft (950 to 3,230 m), on Maui and Hawaii (Wagner *et al.* 1999m, p. 331). *Lapsana communis* is identified as an invasive species in Hawaii (USDA–NRCS 2011a).

• *Leptospermum scoparium* (tea tree) is a shrub or small tree native to New Zealand and Australia, now widely naturalized in Hawaii. It forms thickets and has allelopathic properties that prevent the growth of native plants (Smith 1985, p. 193).

• *Leucaena leucocephala* (koa haole), a shrub native to the neotropics, is now found on all of the main Hawaiian Islands. It is a nitrogen-fixer and an aggressive competitor that often forms the dominant element of the vegetation in low-elevation, dry, disturbed areas (Geesink *et al.* 1999, pp. 679–680).

• *Lythrum maritimum* (loosestrife) is a many-branched shrub occurring in mesic, open, disturbed habitats, especially in pastures, on windward coastal cliffs, in margins of wet forest, and on lava, from sea level up to 8,040-ft (0 to 2,450-m) elevation on all of the main Hawaiian Islands except Niihau and Kahoolawe (Wagner *et al.* 1999q, pp. 867–868). *Lythrum maritimum* is identified as an invasive species in Hawaii (USDA–NRCS 2011b).

• *Melastoma* spp. Plants in the genus *Melastoma* are ornamental shrubs native to southeast Asia; all members of the genus are on the Hawaii State noxious weed list (H.A.R. Title 4, Subtitle 6, Chapter 68). Melastoma species have high germination rates, rapid growth, early maturity, ability of fragments to root, possible asexual reproduction, and efficient seed dispersal (especially by birds that are attracted by copious production of berries) (Smith 1985, p. 194; University of Florida Herbarium 2006). These characteristics enable the plants to be aggressive competitors in Hawaiian ecosystems.

• *Melinis minutiflora* (molasses grass) is a perennial grass up to 3 ft (1 m) tall that forms dense mats and crowds out other plants. These mats also provide fuel for more intense fires that destroy native plants (Cuddihy and Stone 1990, p. 89; O'Connor 1999, p. 1,562).

• *Melinis repens* (natal redtop), a perennial grass native to Africa, is now widely naturalized in the tropics and in Hawaii. It invades disturbed, dry areas from coastal regions to subalpine forest (O'Connor 1999, p. 1,588). Dense stands of natal redtop can contribute to recurrent fires (Desert Museum 2011).

• *Miconia calvescens* (miconia), a tree native to the neotropics, first appeared on Oahu and the island of Hawaii as an introduced garden plant, and has escaped from cultivation (Almeda 1999, p. 903). Miconia is now also found on Kauai and Maui (Wagner and Herbst 2003, p. 34). Miconia is remarkable for its 2- to 3-ft (70-cm) long, dark purple leaves. It reproduces in dense shade, eventually shading out all other plants to form a monoculture. A single mature plant produces millions of seeds per year, which are spread by birds, ungulates, and humans (Motooka *et al.* 2003b). According to the Hawaii Weed Risk Assessment for *M. calvescens,* this species has a high risk of invasiveness or a high risk of becoming a serious pest (PIER 2010f). This species, as well all plants in the Melastoma family, are on the Hawaii State noxious weed list (H.A.R. Title 4, Subtitle 6, Chapter 68).

• *Morella faya* (firetree) is an evergreen shrub or small tree that forms monotypic stands, has the ability to fix nitrogen, and alters the successional ecosystems in areas it invades, displacing native vegetation through competition. It is also a prolific fruit producer (average of 400,000 fruits per individual shrub or tree per year), and the fruit are spread by frugivorous (fruit-

eating) birds and feral pigs (Vitousek 1990, pp. 8–9; Wagner *et al.* 1999v, p. 931; PIER 2008g). This species is on the Hawaii State noxious weed list (H.A.R. Title 4, Subtitle 6, Chapter 68).

• *Neonotonia wightii* (glycine), a twining herb native to Central and South America, is widely naturalized in Hawaii. Glycine forms dense clumps, and can cover and smother other plants (Geesink *et al.* 1999, p. 674; PIER 2010g).

• *Oplismenus hirtellus* (basketgrass) is a perennial grass that forms a dense groundcover, is sometimes climbing, and roots at the nodes, enabling its rapid spread. It also has sticky seeds that attach to visiting animals and birds that then carry them to new areas where they are deposited, resulting in the spread of this species (O'Connor 1999, p. 1,565; Johnson 2005). This species displaces native plants of forest floors and trailsides (Motooka *et al.* 2003c).

• *Paspalum conjugatum* (Hilo grass) is a perennial grass that is found in wet habitats, and forms a dense ground cover. Its small hairy seeds are easily transported on humans and animals, or are carried by the wind through native forests, where it establishes and displaces native vegetation (University of Hawaii Botany Department 1998; Cuddihy and Stone 1990, p. 83; Motooka *et al.* 2003d; PIER 2008h).

• *Passiflora tarminiana* (banana poka), a vine native to South America, is widely cultivated for its fruit (Escobar 1999, pp. 1,007–1,014). First introduced to Hawaii in the 1920s, it is now a serious pest in mesic forest, where it overgrows and smothers the forest canopy. Seeds are readily dispersed by humans, birds, and feral pigs (La Rosa 1992, pp. 281–282). Fallen fruit encourage rooting and trampling by pigs (Diong 1982, pp. 157–158). Field releases of biocontrol agents to control the spread of this species have not been successful to date.

• *Pinus* spp. (pine trees) are tall, evergreen trees or shrubs native to all continents and some oceanic islands, but are not native to any of the Hawaiian Islands. *Pinus caribaea, P. elliottii, P. patula, P. pinaster, P. radiata,* and *P. taeda* are found on Molokai, Lanai, and Maui (Little and Skolmen 1989, pp. 56–60; Oppenheimer 2003, pp. 18–19; PIER 2011c). *Pinus* species were primarily planted by Hawaii State foresters for reforestation and erosion control (Little and Skolmen 1989, pp. 56–60; Oppenheimer 2003, pp. 18–19; PIER 2010h). *Pinus* species are known to establish readily, create dense stands that shade out native plants and prevent regeneration, outcompete native plants for soil water and nutrients, change soil chemistry, promote growth of weed seeds dropped by perching birds, and are highly flammable (Oppenheimer 2010o, in litt.; PIER 2010h). On east Maui, *Pinus* species are a threat at higher elevations because they are invading pastures and native subalpine shrublands (Oppenheimer 2002, pp. 19–23; Oppenheimer 2010o, in litt.).

• *Pluchea carolinensis* (sourbush) is native to Mexico, the West Indies, and South America (Wagner *et al.* 1999m, p. 351). These 3- to 6-ft (1- to 2-m) tall, fast-growing shrubs form thickets in dry habitats and can tolerate saline conditions. They are widespread in Hawaii from coastal areas up to almost 3,000 ft (900 m). The seeds are wind-dispersed (Francis 2004, in litt.). The species is adapted to a wide variety of soils and sites, and it tolerates excessively well to poorly-drained soil conditions, the full range of soil textures, acid and alkaline reactions, salt and salt spray, and compaction. It quickly invades burned areas, but being early successional, is soon replaced by other species. These adaptive capabilities increase the species' competitive abilities over native plants.

• *Prosopis pallida* (kiawe), a tree up to 66 ft (20 m) tall, was introduced to Hawaii in 1828, and its seeds were used as fodder for ranch animals. This species is now a dominant component of the vegetation in low-elevation, dry, disturbed sites, and it is well adapted to dry habitats. It overshadows other vegetation and has deep tap roots that significantly reduce available water for native dry-land plants. This plant fixes nitrogen and can outcompete native species (Geesink *et al.* 1999, pp. 692–693; PIER 2011c).

• *Prunella vulgaris* (self-heal) is a perennial herb in the mint family. This species is naturalized in mesic, disturbed areas, especially pastures and along streambeds in wet forest from 2,690 to 7,415 ft (820 to 2,260 m) in elevation on the islands of Molokai, Maui, and Hawaii (Wagner *et al.* 1999h, pp. 828–829). *Prunella vulgaris* is reported as an invasive species in Hawaii (USDA–NRCS 2011c).

• *Psidium cattleianum* (strawberry guava) is a tall shrub or tree that forms dense stands in which few other plants can grow, displacing native vegetation through competition. The fruit is eaten by feral pigs and birds that disperse the seeds throughout the forest (Smith 1985, p. 200; Wagner *et al.* 1985, p. 24).

• *Psidium guajava* (guava) is a tall shrub or tree that forms dense stands in disturbed forest and excludes native species. The seeds are spread by feral pigs and alien birds, and this species can also regenerate from underground parts by suckering (Wagner *et al.* 1999w, p. 972).

• *Rubus argutus* (prickly Florida blackberry) is a prickly bramble with long, arching stems, and reproduces both vegetatively and by seed. It readily sprouts from underground runners, and is quickly spread by frugivorous birds (Tunison 1991, p. 2; Wagner *et al.* 1999p, p. 1,107; U.S. Army 2006, pp. 2–1–21–2–1–22). This species, which displaces native vegetation through competition, is on the Hawaii State noxious weed list (H.A.R. Title 4, subtitle 6, Chapter 68).

• *Rubus rosifolius* (thimbleberry) is an erect to trailing shrub that forms dense thickets and outcompetes native plant species. It easily reproduces from roots left in the ground, and seeds are spread by birds and feral animals (GISD 2008; PIER 2008i).

• *Sacciolepis indica* (glenwood grass) is an annual grass that invades disturbed and open areas in wet habitats, and prevents the establishment of native plants. Its seeds are dispersed by sticking to animal fur (PIER 2011d; Motooka *et al.* 2003e).

• *Schinus terebinthifolius* (christmasberry) forms dense thickets in all habitats, and its red berries are attractive to and dispersed by birds (Smith 1989, p. 63). *Schinus* seedlings grow very slowly and can survive in dense shade, exhibiting vigorous growth when the canopy is opened after a disturbance (Brazilian Pepper Task Force 1997). Because of these attributes, *S. terebinthifolius* is able to displace native vegetation through competition.

• *Setaria palmifolia* (palmgrass), native to tropical Asia, was first collected on Hawaii Island in 1903 (O'Connor 1999, p. 1,592). A large-leafed, perennial herb, this species reaches approximately 6.5 ft (2 m) in height at maturity, and shades out native vegetation. Palmgrass is resistant to fire and recovers quickly after being burned (Cuddihy and Stone 1990, p. 83).

• *Syzygium cumini* (java plum) is a tree native to India, Ceylon, and the Malesian region, and is widely cultivated and naturalized throughout the tropics. In Hawaii, it is naturalized in mesic valleys and disturbed forests (Wagner *et al.* 1999w, p. 975). This species forms dense cover, excluding all other species, and prevents the reestablishment of native lowland forest plants. The large black fruit is dispersed by frugivorous birds and feral pigs (PIER 2008j).

• *Tibouchina herbacea* (glorybush), an herb or shrub up to 3 ft (1 m) tall, is native to southern Brazil, Uruguay,

and Paraguay. In Hawaii, it is naturalized and abundant in disturbed mesic to wet forest on the islands of Molokai, Lanai, Maui, and Hawaii (Almeda 1999, p. 915). It forms dense thickets, crowding out all other plant species, and inhibits regeneration of native plants (Motooka *et al.* 2003f). All members of this genus are on the Hawaii State noxious weed list (H.A.R. Title 4, Subtitle 6, Chapter 68).

• *Ulex europaeus* (gorse), a woody legume up to 12 ft (4 m) tall and covered with spines, is native to western Europe (Geesink 1999, pp. 715–716). It is cultivated as a hedge and fodder plant, and was inadvertently introduced to Hawaii before 1910, with the establishment of the wool industry (Tulang 1992, pp. 577–583; Geesink 1999, pp. 715–716). Gorse spreads numerous seeds by explosive opening of the pods (Mallinson 2011). It can rapidly form extensive dense and impenetrable infestations, and competes with native plants, preventing their establishment. Dense patches can also present a fire hazard (Mallinson 2011). Over 20,000 ac (8,094 ha) are infested by gorse on the island of Hawaii, and over 15,000 ac (6,070 ha) are infested on Maui (Tulang 1992, pp. 577–583).

• *Youngia japonica* (oriental hawksbeard), an annual herb 3 ft (1 m) tall and native to southeastern Asia, is now a pantropical weed (Wagner *et al.* 1999m, p. 377). In Hawaii, it occurs in moist, disturbed sites, and can invade nearly intact native wet forest where it displaces native species (Wagner *et al.* 1999m, p. 377).

Habitat Destruction and Modification by Fire

Fire is an increasing, human-exacerbated threat to native species and native ecosystems in Hawaii. The historical fire regime in Hawaii was characterized by infrequent, low severity fires, as few natural ignition sources existed (Cuddihy and Stone 1990, p. 91; Smith and Tunison 1992, pp. 395–397). It is believed that prior to human colonization, fuel was sparse and inflammable in wet plant communities and seasonally flammable in mesic and dry plant communities. The primary ignition sources were volcanism and lightning (Baker *et al.* 2009, p. 43). Natural fuel beds were often discontinuous, and rainfall in many areas on most islands was, and is, moderate to high. Fires inadvertently or intentionally ignited by the original Polynesians in Hawaii probably contributed to the initial decline of native vegetation in the drier plains and foothills. These early settlers practiced slash-and-burn agriculture that created open lowland areas suitable for the later colonization of nonnative, fire-adapted grasses (Kirch 1982, pp. 5–6, 8; Cuddihy and Stone 1990, pp. 30–31). Beginning in the late 18th century, Europeans and Americans introduced plants and animals that further degraded native Hawaiian ecosystems. Pasturage and ranching, in particular, created high fire-prone areas of nonnative grasses and shrubs (D'Antonio and Vitousek 1992, p. 67). Although fires were historically infrequent in mountainous regions, extensive fires have recently occurred in lowland dry and lowland mesic areas, leading to grass-fire cycles that convert forest to grasslands (D'Antonio and Vitousek 1992, p. 77).

Because several Hawaiian plants show some tolerance of fire, Vogl proposed that naturally occurring fires may have been important in the development of the original Hawaiian flora (Vogl 1969 in Cuddihy and Stone 1990, p. 91; Smith and Tunison 1992, p. 394). However, Mueller-Dombois (1981 in Cuddihy and Stone 1990, p. 91) points out that most natural vegetation types of Hawaii would not carry fire before the introduction of alien grasses, and Smith and Tunison (1992, p. 396) state that native plant fuels typically have low flammability. Because of the greater frequency, intensity, and duration of fires that have resulted from the introduction of nonnative plants (especially grasses), fires are now destructive to native Hawaiian ecosystems (Brown and Smith 2000, p. 172), and a single grass-fueled fire can kill most native trees and shrubs in the burned area (D'Antonio and Vitousek 1992, p. 74).

Fire represents a threat to many of the native plant species found in the coastal, lowland dry, lowland mesic, montane dry, montane mesic, and dry cliff ecosystems addressed in this proposed rule. The plant species proposed or reevaluated for listing here are threatened by fire are *Bidens campylotheca* ssp. *pentamera, Canavalia pubescens, C. magnicalyx, C. mauiensis, C. obtusa, Festuca molokaiensis, Phyllostegia bracteata, P. haliakalae, Pittosporum halophilum, Pleomele fernaldii, Santalum haleakalae* var. *lanaiense, Schiedea salicaria,* and *Stenogyne kauaulaensis* (see Table 3). Fire can destroy dormant seeds of these species as well as plants themselves, even in steep or inaccessible areas. Successive fires that burn farther and farther into native habitat destroy native plants and remove habitat for native species by altering microclimate conditions favorable to alien plants. Alien plant species most likely to be spread as a consequence of fire are those that produce a high fuel load, are adapted to survive and regenerate after fire, and establish rapidly in newly burned areas. Grasses (particularly those that produce mats of dry material or retain a mass of standing dead leaves) that invade native forests and shrublands provide fuels that allow fire to burn areas that would not otherwise easily burn (Fujioka and Fujii 1980, in Cuddihy and Stone 1990, p. 93; D'Antonio and Vitousek 1992, pp. 70, 73–74; Tunison *et al.* 2002, p. 122). Native woody plants may recover from fire to some degree, but fire shifts the competitive balance toward alien species (National Park Service 1989, in Cuddihy and Stone 1990, p. 93). On a post-burn survey at Puuwaawaa on the island of Hawaii, an area of native *Diospyros* forest with undergrowth of the nonnative grass *Pennisetum setaceum,* Takeuchi noted that ''no regeneration of native canopy is occurring within the Puuwaawaa burn area'' (Takeuchi 1991, p. 2). Takeuchi (1991, pp. 4, 6) also stated that ''burn events served to accelerate a decline process already in place, compressing into days a sequence which would ordinarily take decades,'' and concluded that in addition to increasing the number of fires, the nonnative *Pennisetum* acted to suppress the establishment of native plants after a fire.

For decades, fires have impacted rare or endangered species and areas previously designated or proposed for critical habitat designation in this rule (Gima 1998, in litt.; Pacific Disaster Center 2011; Hamilton 2009, in litt.; Honolulu Advertiser, 2010). The islands of Molokai, Lanai, Maui, and Kahoolawe have experienced 1,291 brush fires between the years 1972 and 1999 that burned a total of 64,248 ac (26,000 ha) (Pacific Disaster Center 2011; County of Maui 2009, Chapter 3, p. 3). Between 2000 and 2003, the annual number of wildfires on Molokai, Lanai, and Maui jumped from 118 to 271, many of which each consumed more than 5,000 ac (2,023 ha) (Pacific Disaster Center 2011).

During the summer of 1998, a raging fire that began in Kaunakakai consumed over 15,000 ac (6,070 ha) on Molokai, including a portion of the Molokai Forest Reserve, consuming roughly 10 percent of the entire island (Gima 1998, in litt.). Molokai experienced three 10,000 ac (4,047 ha) wildfires between the years 2003 and 2004 (Pacific Disaster Center 2011). In late August through early September 2009, a massive wildfire burned for days and consumed approximately 8,000 ac (3,237 ha), including 600 ac (243 ha) of the remote Makakupaia section of the

Molokai Forest Reserve, a small portion of TNC's Kamakou Preserve, and encroached upon Onini Gulch, Kalamaula and Kawela (Hamilton 2009, in litt.). Three species reported from Molokai's coastal and lowland mesic ecosystems (*Festuca molokaiensis, Phyllostegia haliakalae,* and *Pittosporum halophilum*) are threatened by fire because individuals of these species or their habitat are located in or near areas that were burned in previous fires.

The island of Lanai has experienced several wildfires in the last decade. In 2006, a wildfire burned 600 ac (243 ha) between Manele Road and the Palawai basin (2.5 mi (4 km) south of Lanai City) (The Maui News 2006, in litt.). In 2007, a brush fire occurred in the Mahana area, burning an estimated 30 ac (12 ha), and in 2008, another 1,000 ac (405 ha) were burned by wildfire in the Palawai basin (The Maui News 2007, in litt.; KITV Honolulu 2008, in litt.). All known individuals of *Pleomele fernaldii* lie just southeast of the area burned during the Mahana fire and east of the Palawai basin fires. Many of these individuals could be decimated by one large fire.

Between the years 2007 and 2010, wildfires burned more than 8,650 ac (3,501 ha) on west Maui (Shimogawa 2010, in litt.; Honolulu Advertiser 2010, in litt.). In 2007, a fire that started along Honoapiilani Highway on the south coast of west Maui burned a total of 1,350 ac (546 ha), encroached into the West Maui Natural Area Reserve (Panaewa section), and threatened the proposed plants *Phyllostegia bracteata* and *Schiedea salicaria* (HDLNR 1989, pp. 53–63; KITV 2007, in litt.). In May 2010, another fire occurred farther south along the same highway, moved up the ridges of Olowalu, and eventually encompassed 1,100 ac (445 ha). Later the same year, a fire that started at Maalaea initially destroyed 200 ac (81 ha), and because of strong winds and drought conditions, continued to burn for 8 days, moved up Kealaloloa and nearby ridges, and encompassed a total of 6,200 ac (2,509 ha). This fire is on record as the largest brush fire that has occurred on Maui. Nine species reported from Maui's lowland dry, lowland mesic, montane dry, montane mesic, and dry cliff ecosystems (*Bidens campylotheca* ssp. *pentamera, Canavalia pubescens, C. magnicalyx, C. mauiensis, C. obtusa, Phyllostegia bracteata, Santalum haleakalae* var. *lanaiense, Schiedea salicaria,* and *Stenogyne kauaulaensis*) are threatened by fire because individuals of these species or their habitat are located in or near areas that were burned in previous fires or in areas at risk for fire due to the presence of highly flammable nonnative grasses and pine trees.

Habitat Destruction and Modification by Hurricanes

Hurricanes adversely impact native Hawaiian terrestrial habitat, including each of the 10 Maui Nui ecosystems addressed here and their associated species identified in this proposed rule. They do this by destroying native vegetation, opening the canopy and thus modifying the availability of light, and creating disturbed areas conducive to invasion by nonnative pest species (see ''Specific Nonnative Plant Species Impacts,'' above) (Asner and Goldstein 1997, p. 148; Harrington *et al.* 1997, pp. 539–540). Because many Hawaiian plant and animal species, including the 40 species proposed or reevaluated for listing here, persist in low numbers and in restricted ranges, natural disasters, such as hurricanes, can be particularly devastating (Mitchell *et al.* 2005, pp. 3–4).

Hurricanes affecting Hawaii were only rarely reported from ships in the area from the 1800s until 1949. Between 1950 and 1997, 22 hurricanes passed near or over the Hawaiian Islands, 5 of which caused serious damage (Businger 1998, pp. 1–2). In November 1982, Hurricane Iwa struck the Hawaiian Islands, with wind gusts exceeding 100 miles per hour (mph) (161 kilometers per hour (kph)), causing extensive damage, especially on the islands of Niihau, Kauai, and Oahu (Businger 1998, pp. 2, 6). Many forest trees were destroyed (Perlman 1992, pp. 1–9), which opened the canopy and facilitated the invasion of nonnative plants (Kitayama and Mueller-Dombois 1995, p. 671). Competition with nonnative plants is a threat to each of the 10 ecosystems that support the 40 species proposed or reevaluated for listing here, and to 35 of the 37 plant species addressed in this proposed rule, as described in the ''Specific Nonnative Plant Species Impacts'' section above. Biologists have reported that hurricanes are a threat to the three tree snails proposed for listing (*Newcombia cumingi, Partulina semicarinata,* and *P. variabilis*). High winds and intense rains from hurricanes can dislodge snails from the leaves and branches of their host plants and deposit them on the forest floor where they may be crushed by falling vegetation or exposed to predation by nonnative rats and snails (see ''Disease or Predation,'' below) (Hadfield 2011, pers. comm.). Although there is historical evidence of only one hurricane that approached from the east and impacted the islands of Maui and Hawaii (Businger 1998, p. 3), damage by future hurricanes could further decrease the remaining native plant-dominated habitat areas that support the 40 species proposed or reevaluated for listing in 10 of the described ecosystems (coastal, lowland dry, lowland mesic, lowland wet, montane dry, montane mesic, montane wet, subalpine, dry cliff, and wet cliff) (Bellingham *et al.* 2005, p. 681).

Habitat Destruction and Modification Due to Landslides, Rockfalls, Treefalls, Flooding, and Drought

Landslides, rockfalls, treefalls, and flooding destabilize substrates, damage and destroy individual plants, and alter hydrological patterns, which result in changes to native plant and animal communities. In the open sea near Hawaii, rainfall averages 25 to 30 in (635 to 762 mm) per year, yet the islands may receive up to 15 times this amount in some places, caused by orographic features (physical geography of mountains) (Wagner *et al.* 1999b; adapted from Price (1983) and Carlquist (1980)), pp. 38 and 39). During storms, rain may fall at 3 in (76 mm) per hour or more, and sometimes may reach nearly 40 in (1,000 mm) in 24 hours, causing destructive flash-flooding in streams and narrow gulches (Wagner *et al.* 1999b; adapted from Price (1983) and Carlquist (1980)), pp. 38–39). Due to the steep topography of much of the areas on Molokai, Lanai, and Maui where these 40 species remain, erosion and disturbance caused by introduced ungulates exacerbate the potential for landslides, rockfalls, or flooding, which in turn threaten native plants. For those species that occur in small numbers in highly restricted geographic areas, such events have the potential to eradicate all individuals of a population, or even all populations of a species, resulting in extinction.

Landslides, rockfalls, and treefalls likely adversely impact 14 of the species addressed in this proposed rule, including *Cyanea asplenifolia, C. grimesiana* ssp. *grimesiana, C. horrida, C. magnicalyx, C. maritae, C. mauiensis, C. munroi, C. profuga, C. solanacea, Cyrtandra filipes, Schiedea jacobii, S. laui, Stenogyne kauaulaensis,* and *Wikstroemia villosa,* as documented in observations by field botanists and surveyors (HBMP 2008). Monitoring data from PEPP and the HBMP suggest that these 14 species are threatened by landslides or falling rocks, as they are found in landscape settings susceptible to these events (e.g., steep slopes and cliffs). Field survey data presented by Oppenheimer documented the direct damage from landslides to individuals

of *Cyanea solanacea* located along a stream bank and steep slope beneath a cliff (PEPP 2007, p. 41). Since *Cyanea solanacea* is known from a total of 26 individuals in steep-walled stream valleys, one or several landslides could lead to near extirpation or even extinction of the species by direct destruction of the individual plants, mechanical damage to individual plants that could lead to their death, destabilization of the cliff habitat leading to additional landslides, and alteration of hydrological patterns (e.g., affecting the availability of soil moisture). Perlman (2009b, in litt.) noted the threat of rolling or falling rocks to one population of *Cyanea magnicalyx.*

Monitoring data presented by HBMP and the PEPP program suggest that flooding is a likely threat to five plant species included in this proposed listing, *Bidens campylotheca* ssp. *waihoiensis, Cyanea duvalliorum, C. horrida, C. profuga,* and *Schiedea laui.* Field survey data presented by PEPP (2008, pp. 107–108) and by Bakutis (2010, in litt.) suggest that catastrophic flooding or landslides are possible at one population of *Schiedea laui* located in a cave along a narrow stream corridor at the base of a waterfall in the Kamakou Preserve.

Four plant species, *Cyanea horrida, Festuca molokaiensis, Schiedea jacobii,* and *Stenogyne kaualaensis,* and the three tree snails proposed for listing in this proposed rule may also be affected by habitat loss or degradation associated with droughts, which are not uncommon in the Hawaiian Islands. Between 1860 and 2006, there have been 30 periods of Statewide drought that have also affected the islands of Molokai, Lanai, and Maui (Giambelluca *et al.* 1991, pp. 3–4; Hawaii Commission on Water Resource Management 2009a and 2009b). In 2006, Maui County was designated a primary disaster area because of a severe drought from April to September 2006 (Pacific Disaster Center, 2010). It is suggested that *Festuca molokaiensis,* a purported annual plant, has not been observed at its known location in recent years due to drought conditions on Molokai (Oppenheimer 2011, pers. comm.). Drought also leads to an increase in the number of forest and brush fires (Giambelluca *et al.* 1991, p. v), causing a reduction of native plant cover and habitat (D'Antonio and Vitousek 1992, pp. 77–79) and a reduction in availability of host plants for the three tree snails. Recent episodes of drought have also driven axis deer farther into urban and forested areas for food, increasing their negative impacts to native vegetation from herbivory and trampling (see ''Disease and Predation,'' below) (Waring 1996, in litt., p. 5; Nishibayashi 2001, in litt.).

Habitat Destruction and Modification by Climate Change

Climate change will be a particular challenge for the conservation of biodiversity because the introduction and interaction of additional stressors may push species beyond their ability to survive (Lovejoy 2005, pp. 325–326). The synergistic implications of climate change and habitat fragmentation are the most threatening facet of climate change for biodiversity (Hannah *et al.* 2005, p. 4). The magnitude and intensity of the impacts of global climate change and increasing temperatures on native Hawaiian ecosystems are unknown. Currently, there are no climate change studies that specifically address impacts to the Maui Nui ecosystems discussed here or the 40 species proposed or reevaluated for listing that are associated with these ecosystems. Based on the best available information, climate change impacts could lead to the loss of native species that comprise the communities in which the 40 species occur (Pounds *et al.* 1999, pp. 611–612; Still *et al.* 1999, p. 610; Benning *et al.* 2002, pp. 14,246–14,248; Allen *et al.* 2010, pp. 660–662; Sturrock *et al.* 2011, p. 144; Towsend *et al.* 2011, p. 15; Warren 2011, pp. 221–226). In addition, weather regime changes (droughts, floods) will likely result from increased annual average temperatures related to more frequent El Niño episodes in Hawaii (Giambelluca *et al.* 1991, p. v). Future changes in precipitation and the forecast of those changes are highly uncertain because they depend, in part, on how the El Niño-La Niña weather cycle (a disruption of the ocean atmospheric system in the tropical Pacific having important global consequences for weather and climate) might change (State of Hawaii 1998, pp. 2–10). The 40 species proposed or reevaluated for listing may be especially vulnerable to extinction due to anticipated environmental changes that may result from global climate change, due to their small population size and highly restricted ranges. Environmental changes that may affect these species are expected to include habitat loss or alteration and changes in disturbance regimes (e.g., storms and hurricanes).

Climate Change and Ambient Temperature

The average ambient air temperature (at sea level) is projected to increase by about 4.1 degrees Fahrenheit (°F) (2.3 °Centigrade (C)) with a range of 2.7 °F to 6.7 °F (1.5 °C to 3.7 °C) by 2100 worldwide (Intergovernmental Panel on Climate Change (IPCC) 2007). These changes would increase the monthly average temperature of the Hawaiian Islands from the current value of 74 °F (23.3 °C) to between 77 °F to 86 °F (25 °C to 30 °C). Historically, temperature has been rising over the last 100 years with the greatest increase after 1975 (Alexander *et al.* 2006, pp. 1–22; Giambelluca *et al.* 2008, p. 1). The rate of increase at low elevation (0.16 °F; 0.09 °C) per decade is below the observed global temperature rise of 0.32 °F (0.18 °C) per decade (IPCC 2007). However, at high elevations, the rate of increase (0.48 °F (0.27 °C) per decade) greatly exceeds the global rate (IPCC 2007).

Overall, the daily temperature range in Hawaii is decreasing, resulting in a warmer environment, especially at higher elevations and at night. In the main Hawaiian Islands, predicted changes associated with increases in temperature include a shift in vegetation zones upslope, shift in animal species' ranges, changes in mean precipitation with unpredictable effects on local environments, increased occurrence of drought cycles, and increases in the intensity and number of hurricanes (Loope and Giambelluca 1998, pp. 514–515; U.S. Global Change Research Program (US–GCRP) 2009). In addition, weather regime changes (e.g., droughts, floods) will likely result from increased annual average temperatures related to more frequent El Niño episodes in Hawaii (Giambelluca *et al.* 1991, p. v). However, despite considerable progress made by expert scientists toward understanding the impacts of climate change on many of the processes that contribute to El Niño variability, it is not possible to say whether or not El Niño activity will be affected by climate change (Collins *et al.* 2010, p. 391).

The warming atmosphere is creating a plethora of anticipated and unanticipated environmental changes such as melting ice caps, decline in annual snow mass, sea-level rise, ocean acidification, increase in storm frequency and intensity (e.g., hurricanes, cyclones, and tornadoes), and altered precipitation patterns that contribute to regional increases in floods, heat waves, drought, and wildfires that also displace species and alter or destroy natural ecosystems (Pounds *et al.* 1999, pp. 611–612; IPCC 2007; Marshall *et al.* 2008, p. 273; U.S. Climate Change Science Program 2008; Flannigan *et al.* 2009, p. 483; US–GCRP 2009; Allen *et al.* 2010, pp. 660–662; Warren 2011, pp. 221–226). These

environmental changes are predicted to alter species migration patterns, lifecycles, and ecosystem processes such as nutrient cycles, water availability, and decomposition (IPCC 2007; Pounds *et al.* 1999, pp. 611–612; Sturrock *et al.* 2011, p. 144; Townsend *et al.* 2011, p. 15; Warren 2011, pp. 221–226). The species extinction rate is predicted to increase congruent with ambient temperature increase (US–GCRP 2009).

Climate Change and Precipitation

As global surface temperature rises, the evaporation of water vapor increases, resulting in higher concentrations of water vapor in the atmosphere, further resulting in altered global precipitation patterns (U.S. National Science and Technology Council (US–NSTC) 2008; US–GCRP 2009). While annual global precipitation has increased over the last 100 years, the combined effect of increases in evaporation and evapotranspiration is causing land surface drying in some regions leading to a greater incidence and severity of drought (US–NSTC 2008; US–GCRP 2009). Over the the past 100 years, the Hawaiian Islands have experienced an annual decline in precipitation of just over 9 percent (US–NSTC 2008). Other data on precipitation in Hawaii, which includes sea level precipitation and the added orographic effects, show a steady and significant decline of about 15 percent over the last 15 to 20 years (Chu and Chen 2005, p. 4,881–4,900; Diaz *et al.* 2005, pp. 1–3). Exact future changes in precipitation in Hawaii and the forecast of those changes are uncertain because they depend, in part, on how the El Niño-La Niña weather cycle might change (State of Hawaii 1998, pp. 2–10).

In the oceans around Hawaii, the average annual rainfall at sea level is about 25 in (63.5 cm). The orographic features of the islands increase this annual average to about 70 in (177.8 cm) but can exceed 240 in (609.6 cm) in the wettest mountain areas. Rainfall is distributed unevenly across each high island, and rainfall gradients are extreme (approximately 25 in (63.5 cm) per mile), creating both very dry and very wet areas. Global climate modeling predicts that, by 2100, net precipitation at sea level near the Hawaiian Islands will decrease in winter by about 4 to 6 percent, with no significant change during summer (IPCC 2007). Downscaling of global climate models indicates that wet-season (winter) precipitation will decrease by 5 percent to 10 percent, while dry-season (summer) precipitation will increase by about 5 percent (Timm and Diaz 2009, pp. 4,261–4,280). These data are also supported by a steady decline in stream flow beginning in the early 1940s (Oki 2004, p. 1). Altered seasonal moisture regimes can have negative impacts on plant growth cycles and overall negative impacts on natural ecosystems (US–GCRP 2009). Long periods of decline in annual precipitation result in a reduction in moisture availability, an increase in drought frequency and intensity, and a self-perpetuating cycle of nonnative plants, fire, and erosion (US–GCRP 2009; Warren 2011, pp. 221–226) (see ''Habitat Destruction and Modification by Fire,'' above). These impacts may negatively affect the 40 species proposed or reevaluted for listing here and the 10 ecosystems that support them.

Climate Change, and Tropical Cyclone Frequency and Intensity

A tropical cyclone is the generic term for a medium to large scale low-pressure system over tropical or subtropical waters with organized convection (i.e., thunderstorm activity) and definite cyclonic surface wind circulation (counterclockwise direction in the Northern Hemisphere) (Holland 1993, pp. 1–8). In the Northeast Pacific Ocean, east of the International Date Line, once a tropical cyclone reaches an intensity with winds of at least 74 mi per hour (33 m per second) it is considered a hurricane (Neumann 1993, pp. 1–2). Climate modeling has projected changes in tropical cyclone frequency and intensity due to global warming over the next 100 to 200 years (Vecchi and Soden 2007, pp. 1,068–1,069, Figures 2 and 3; Emanuel *et al.* 2008, p. 360, Figure 8; Yu *et al.* 2010, p. 1,371, Figure 14). The frequency of hurricanes generated by tropical cyclones is projected to decrease in the central Pacific (e.g., the main and Northwestern Hawaiian Islands) while storm intensity (strength) is projected to increase by a few percent over this period (Vecchi and Soden 2007, pp. 1,068–1,069, Figures 2 and 3; Emanuel *et al.* 2008, p. 360, Figure 8; Yu *et al.* 2010, p. 1,371, Figure 14). There are no climate model predictions for a change in the duration of Pacific tropical cyclone storm season (which generally runs from May through November).

In general, tropical cyclones with the intensities of hurricanes have been a rare occurrence in the Hawaiian Islands. From the 1800s until 1949, hurricanes were only rarely reported from ships in the area. Between 1950 and 1997, 22 hurricanes passed near or over the Hawaiian Islands, 5 of which caused serious damage (Businger 1998, in litt., pp. 1–2). Hurricanes may cause destruction of native vegetation and open the native canopy, allowing for invasion by nonnative plant species which compete for space, water, and nutrients, and alter basic water and nutrient cycling processes leading to decreased growth and reproduction for all 37 plant species proposed or reevaluated for listing in this proposed rule (see Table 3) (Perlman 1992, in litt., pp. 1–9; Kitayama and Mueller-Dombois 1995, p. 671). Hurricanes also constitute a threat to the three proposed tree snails (*Newcombia cumingi, Partulina semicarinata* and *P. variabilis*) as a result of their high winds that may dislodge snails from their host trees, thereby increasing the likelihood of mortality caused by falling vegetation and ground-based predators, such as nonnative rats (*Rattus* spp.) and snails (see ''Disease or Predation,'' below). Although there is historical evidence of only one hurricane that approached from the east and impacted the islands of Maui and Hawaii (Businger 1998, p.3), damage by future hurricanes could further decrease the remaining native plant-dominated habitat areas that support the 40 species proposed or reevaluated for listing in 10 of the described ecosystems (coastal, lowland dry, lowland mesic, lowland wet, montane dry, montane mesic, montane wet, subalpine, dry cliff, and wet cliff) (Bellingham *et al.* 2005, p. 681).

Climate Change, and Sea Level Rise and Coastal Inundation

On a global scale, sea level is rising as a result of thermal expansion of warming ocean water; the melting of ice sheets, glaciers, and ice caps; and the addition of water from terrestrial systems (Climate Institute 2011). Sea level rose at an average rate of 0.1 in (1.8 mm) per year between 1961 and 2003 (IPCC 2007, p. 5), and the predicted increase by the end of this century, without accounting for ice sheet flow, ranges from 0.6 ft to 2.0 ft (0.18 m to 0.6 m) (IPCC 2007, p. 13). When ice sheet and glacial melt are incorporated into models, the average estimated increase in sea level by the year 2100 is approximately 3 to 4 ft (0.9 to 1.2 m), with some estimates as high as 6.6 ft (2.0 m) to 7.8 ft (2.4 m) (Rahmstorf 2007, pp. 368–370; Pfeffer *et al.* 2008, p. 1,340; Fletcher 2009, p. 7; US–GCRP 2009, p. 18). There is no specific information available on how sea level rise and coastal inundation will impact the coastal ecosystems on Maui and Molokai where two of the proposed species, *Canavalia pubescens* and *Pittosporum halophilum,* are currently found.

Increased interannual variability of ambient temperature, precipitation, hurricanes, and sea level rise and inundation would provide additional stresses on the 10 ecosystems and each of the associated 40 species proposed or reevaluated for listing in this proposed rule because they are highly vulnerable to disturbance and related invasion of nonnative species. The probability of a species going extinct as a result of such factors increases when its range is restricted, habitat decreases, and population numbers decline (IPCC 2007, p. 8). The 40 species have limited environmental tolerances, ranges, restricted habitat requirements, small population sizes, and low numbers of individuals. Therefore, we would expect these species to be particularly vulnerable to projected environmental impacts that may result from changes in climate and subsequent impacts to their habitats (e.g., Loope and Giambelluca 1998, pp. 504–505; Pounds *et al.* 1999, pp. 611–612; Still *et al.* 1999, p. 610; Benning *et al.* 2002, pp. 14,246–14,248, Giambelluca and Luke 2007, pp. 13–18). Based on the above information, we conclude that changes in environmental conditions that result from climate change are likely to negatively impact these 40 species, and we do not anticipate a reduction in this potential threat in the near future.

Summary of Habitat Destruction and Modification

The threats to the habitats of each of the 40 species proposed or reevaluated for listing in this proposed rule are occurring throughout the entire range of each of the species. These threats include land conversion by agriculture and urbanization, nonnative ungulates and plants, fire, natural disasters, and climate change, and the interaction of these threats.

Development and urbanization of coastal and lowland dry habitat on Maui represents a serious and ongoing threat to approximately 20 individuals of *Canavalia pubescens* remaining at Palauea-Keahou.

The effects from ungulates are serious and ongoing because ungulates currently occur in the 10 ecosystems that support the 40 species proposed or reevaluated for listing in this rule. Ungulates directly threaten 35 of the 37 plant species, and 2 of the 3 snail species (*Partulina semicarinata* and *P. variabilis*) proposed or reevaluated for listing in this rule (see Table 3), because they cause: (1) Trampling and grazing that directly impact the plant communities, which include the plant species proposed or reevaluated for listing, and impact host plants used by *Partulina semicarinata* and *P. variabilis* for foraging, shelter, and reproduction; (2) increased soil disturbance, leading to mechanical damage to individuals of the plant species proposed or reevaluated for listing, and plants used by the two tree snails for foraging, shelter, and reproduction; and (3) creation of open, disturbed areas conducive to weedy plant invasion and establishment of alien plants from dispersed fruits and seeds, which results over time in the conversion of a community dominated by native vegetation to one dominated by nonnative vegetation (leading to all of the negative impacts associated with nonnative plants, listed below). These threats are expected to continue or increase without ungulate control or eradication.

Nonnative plants represent a serious and ongoing threat to 36 of the 40 species proposed or reevaluated for listing (35 plant species and the tree snail *Newcombia cumingi;* see Table 3) through habitat destruction and modification because they: (1) Adversely impact microhabitat by modifying the availability of light; (2) alter soil-water regimes; (3) modify nutrient cycling processes; (4) alter fire characteristics of native plant habitat, leading to incursions of fire-tolerant nonnative plant species into native habitat; and (5) outcompete, and possibly directly inhibit the growth of, native plant species. Each of these threats can convert native-dominated plant communities to nonnative plant communities (Cuddihy and Stone 1990, p. 74; Vitousek 1992, pp. 33–35). This conversion has negative impacts on, and threatens, 35 of the 37 plant species addressed here, as well as the native plant species upon which *Newcombia cumingi* depends for essential life-history needs.

The threat from fire to 13 of the 40 species proposed or reevaluated for listing in this proposed rule that depend on coastal, lowland dry, lowland mesic, montane dry, montane mesic, and dry cliff ecosystems (*Bidens campylotheca* ssp. *pentamera, Canavalia pubescens, Cyanea magnicalyx, C. mauiensis, C. obtusa, Festuca molokaiensis, Phyllostegia bracteata, P. haliakalae, Pittosporum halophilum, Pleomele fernaldii, Santalum haleakalae* var. *lanaiensis, Schiedea salicaria,* and *Stenogyne kauaulaensis;* see Table 3) is serious and ongoing because fire damages and destroys native vegetation, including dormant seeds, seedlings, and juvenile and adult plants. Many nonnative invasive plants, particularly fire-tolerant grasses, outcompete native plants and inhibit their regeneration (D'Antonio and Vitousek 1992, pp. 70, 73–74; Tunison *et al.* 2002, p. 122). Successive fires that burn farther and farther into native habitat destroy native plants and remove habitat for native species by altering microclimatic conditions and creating conditions favorable to alien plants. The threat from fire is unpredictable but increasing in frequency in ecosystems that have been invaded by nonnative, fire-prone grasses.

Natural disasters such as hurricanes adversely impact native Hawaiian terrestrial habitat including the 10 ecosystems addressed here and all 37 plant species proposed or reevaluated for listing in this rule because they open the forest canopy, modify available light, and create disturbed areas that are conducive to invasion by nonnative pest plants (Asner and Goldstein 1997, p. 148; Harrington *et al.* 1997, pp. 346–347). In addition, hurricanes threaten the three tree snail species in this proposed rule because strong winds and intense rainfall can dislodge individual snails from their host plants and deposit them on the ground where they may be crushed by falling debris or eaten by nonnative rats and snails. The impacts of hurricanes and other stochastic natural events can be particularly devastating to the 40 species proposed or reevaluated for listing because, as a result of other threats, they now persist in low numbers or occur in restricted ranges and are therefore less resilient to such disturbances, rendering them highly vulnerable to extirpation. Furthermore, a particularly destructive hurricane holds the potential of driving a localized endemic species to extinction in a single event. Hurricanes pose an ongoing and ever-present threat because they can happen at any time, although their occurrence is not predictable.

Landslides, rockfalls, treefalls, and flooding adversely impact 16 of the species proposed or reevaluated for listing (*Bidens campylotheca* ssp. *waihoiensis, Cyanea asplenifolia, C. duvalliorum, C. grimesiana* ssp. *grimesiana, C. horrida, C. magnicalyx, C. maritae, C. mauiensis, C. munroi, C. profuga, C. solanacea, Cyrtandra filipes, Schiedea jacobii, S. laui, Stenogyne kauaulaensis,* and *Wikstroemia villosa;* see Table 3) by destabilizing substrates, damaging and destroying individual plants, and altering hydrological patterns, which result in habitat destruction or modification and changes to native plant and animal communities. Drought threatens four plant species—*Cyanea horrida, Festuca molokaiensis, Schiedea jacobii,* and *Stenogyne kauaulaesis*—and all three tree snails—*Newcombia cumingi, Partulina*

semicarinata, and *P. variabilis*—by the loss or degradation of habitat due to death of individual native plants and host tree species, as well as an increase in forest and brush fires. These threats are serious and have the potential to occur at any time, although their occurrence is not predictable.

Changes in environmental conditions that may result from global climate change include increasing temperatures, decreasing precipitation, increasing storm intensities, and sea level rise and coastal inundation. The consequent impacts on the 40 species proposed or reevaluated for listing here are related to changes in microclimatic conditions in their habitats. These changes may lead to the loss of native species due to direct physiological stress, the loss or alteration of habitat, or changes in disturbance regimes (e.g., droughts, fire, storms, and hurricanes). Because the specific and cumulative effects of climate change on the 40 species are presently unknown, we are not able to determine the magnitude of this possible threat with confidence.

B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

Plants

We are not aware of any threats to the 37 plant species addressed in this proposed rule that would be attributed to overutilization for commercial, recreational, scientific, or educational purposes.

Tree Snails

Tree snails can be found around the world in tropical and subtropical regions and have been valued as collectibles for centuries. Evidence of tree snail trading among prehistoric Polynesians was discovered by a genetic characterization of the enigmatic multi-archipelagic distribution of the Tahitian endemic *Partula hyalina* and related taxa (Lee *et al.* 2007, pp. 2,907, 2,910). In their study, Lee *et al.* (2007, pp. 2,908–2,910) found evidence that *Partula hyalina* had been traded as far away as Mangaia in the Southern Cook Islands, a distance of over 500 mi (805 km). The endemic Hawaiian tree snails within the family Achatinellidae (subfamily Achatinellinae) were extensively collected for scientific as well as recreational purposes by Europeans in the 18th to early 20th centuries (Hadfield 1986, p. 322). During the 1800s, collectors observed 500 to 2,000 snails per tree, and sometimes collected over 4,000 snails in just several hours (Hadfield 1986, p. 322). We may infer that the repeated collections of hundreds to thousands of individuals at a time by early collectors resulted in decreased population sizes and reduction of reproduction potential due to the removal of potential breeding adults. The Achatinellinae do not reach reproductive age until nearly 10 years old, after which they produce only 4 to 6 offspring per year (Hadfield 2011, pers. comm.). The allure of tree snails persists to this day, and there is a market for rare tree snails that may serve as an incentive to collect them. A search of the Internet (e.g., eBay.com, google.com) reveals Web sites that offer Hawaiian tree snail shells for sale, including other species of the endemic Hawaiian tree snail genus *Partulina.* Based on the history of collection of endemic Hawaiian tree snails, the market for Hawaiian tree snail shells, and the vulnerability of the small populations of *Newcombia cumingi, Partulina semicarinata,* and *P. variabilis* to the negative impacts of any collection, we consider the potential overcollection of these three Hawaiian tree snails to pose a serious and ongoing threat, because it can occur at any time, although its occurrence is not predictable.

Summary of Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

We have no evidence to suggest that overutilization for commercial, recreational, scientific, or educational purposes poses a threat to any the 37 plant species proposed or reevaluated for listing. We consider the three species of tree snails vulnerable to the impacts of overutilization due to collection for trade or market. Based on the history of collection of endemic Hawaiian tree snails, the market for Hawaiian tree snail shells, and the inherent vulnerability of the small populations of *Newcombia cumingi, Partulina semicarinata,* and *P. variabilis* to the removal of breeding adults, we consider collection to pose a serious and ongoing threat to these species.

C. Disease or Predation

Disease

We are not aware of any threats to the 37 plant species addressed in this proposed rule that would be attributable to disease. Disease is a potential threat to the three tree snails proposed in this rule, *Newcombia cumingi, Partulina semicarinata,* and *P. variabilis;* evidence for this is based on attempts to raise these species in captivity. Due to the extremely low numbers and threat of extinction of Hawaiian tree snails in the wild, captive breeding of over 20 species has been implemented over the past decade. Hadfield (2010, pers. comm.) notes that individuals of *Newcombia cumingi* do not survive long in captivity, and individuals of *Partulina* spp. sometimes die off for unknown reasons (Hadfield 2011, pers. comm.). According to Hadfield (2011, pers. comm.), the London Zoo found evidence of protozoan presence in a non-Hawaiian species of *Partulina,* which is indicative of disease. Hadfield (2011, pers. comm.) also suggests there is a negative correlation between reproductive potential in Hawaiian tree snails and time in captivity, likely due to inbreeding depression or environmental conditions, including disease.

Because we have no evidence that disease may be impacting natural populations of the three tree snail species, we cannot conclude that this threat may have contributed to the current population status of *Newcombia cumingi, Partulina semicarinata,* and *P. variabilis* such that listing of any of the three species would be warranted based on this factor. However, we note that disease is a potential threat to captive bred Hawaiian tree snails and may be of particular concern for *Newcombia cumingi,* which is not successfully surviving or reproducing in captivity, potentially due to disease, and is only known from nine individuals in one location in the wild. Recovery of this species will likely depend on successful captive propagation and eventual translocation to protected sites in the wild.

Predation and Herbivory

Hawaii's plants and animals evolved in nearly complete isolation from continental influences. Successful colonization of these remote volcanic islands was infrequent, and many organisms never succeeded in establishing populations. As an example, Hawaii lacks any native ants or conifers, has very few families of birds, and has only a single extant native land mammal, a bat (Loope 1998, p. 748). In the absence of any grazing or browsing mammals, plants that became established did not need mechanical or chemical defenses against mammalian herbivory such as thorns, prickles, and production of toxins. As the evolutionary pressure to either produce or maintain such defenses was lacking, Hawaiian plants either lost or never developed these adaptations (Carlquist 1980, p. 173). Likewise native Hawaiian birds and insects experienced no evolutionary pressure to develop anti-predator mechanisms against mammals or invertebrates that were not

historically present on the island. The native flora and fauna of the islands are thus particularly vulnerable to the impacts of introduced nonnative species, as discussed below.

Introduced Ungulates

In addition to the habitat impacts discussed above (see ''Habitat Destruction and Modification by Introduced Ungulates'' under Factor A), introduced ungulates threaten the following 35 plant species in this proposal by grazing and browsing individual plants (this information is also presented in Table 3): *Bidens campylotheca* ssp. *pentamera* (pigs, goats, and axis deer), *B. campylotheca* ssp. *waihoiensis* (pigs, goats, and axis deer), *B. conjuncta* (pigs and goats), *Calamagrostis hillebrandii* (pigs), *Canavalia pubescens* (pigs, goats, cattle, and axis deer), *Cyanea asplenifolia* (pigs, goats, cattle, and axis deer), *C. duvalliorum* (pigs), *C. grimesiana* ssp. *grimesiana* (pigs, goats, and axis deer), *C. horrida* (pigs), *C. kunthiana* (pigs), *C. magnicalyx* (pigs), *C. maritae* (pigs), *C. mauiensis* (pigs), *C. munroi* (goats and axis deer), *C. obtusa* (pigs, goats, cattle, and axis deer), *C. profuga* (pigs and goats), *C. solanacea* (pigs and goats), *Cyrtandra ferripilosa* (pigs and goats), *C. filipes* (pigs, goats, and axis deer), *C. oxybapha* (pigs, goats, and cattle), *Festuca molokaiensis* (goats), *Geranium hanaense* (pigs), *G. hillebrandii* (pigs), *Mucuna sloanei* var. *persericea* (pigs and cattle), *Myrsine vaccinioides* (pigs), *Peperomia subpetiolata* (pigs), *Phyllostegia bracteata* (pigs and cattle), *P. haliakalae* (cattle), *P. pilosa* (pigs and goats), *Pittosporum halophilum* (pigs), *Pleomele fernaldii* (axis deer and mouflon), *Santalum haleakalae* var. *lanaiense* (pigs, goats, axis deer, and mouflon), *Schiedea jacobii* (goats, cattle, and axis deer), *S. salicaria* (goats, cattle, and axis deer), and *Wikstroemia villosa* (pigs).

We have direct evidence of ungulate damage to some of these species, but for many, due to their remote locations or lack of study, ungulate damage is presumed based on the known presence of these introduced ungulates in the areas where these species occur and the results of studies conducted in Hawaii and elsewhere (Diong 1982, p. 160). For example, in a study conducted by Diong (1982, p. 160) on Maui, feral pigs were observed browsing on young shoots, leaves, and fronds of a wide variety of plants, of which over 75 percent were endemic species. A stomach content analysis in this study showed that 60 percent of the pigs' food source consisted of the endemic *Cibotium* (hapuu, tree fern). Pigs were observed to fell plants and remove the bark from native plant species within the genera *Cibotium, Clermontia, Coprosma, Hedyotis, Psychotria,* and *Scaevola,* resulting in larger trees being killed over a few months of repeated feeding (Diong 1982, p. 144). Beach (1997, pp. 3–4) found that feral pigs in Texas spread disease and parasites, and their rooting and wallowing behavior led to spoilage of watering holes and loss of soil through leaching and erosion. Rooting activities also decreased the survivability of some plant species through disruption at root level of mature plants and seedlings (Beach 1997, pp. 3–4; Anderson *et al.* 2007, pp. 2–3). In Hawaii, pigs dig up forest ground cover consisting of delicate and rare species of orchids, ferns, mints, lobeliads, and other taxa, including roots, tubers, and rhizomes (Stone and Anderson 1988, p. 137). In addition, there are direct observations of pig herbivory on four of the plant species proposed for listing in this rule, including *Cyanea magnicalyx* (PEPP 2010, p. 49), *C. maritae* (PEPP 2010, p. 50), *Peperomia subpetiolata* (PEPP 2010, p. 97), and *Phyllostegia pilosa* (PEPP 2009, p. 93). As pigs occur in 10 ecosystems (coastal, lowland dry, lowland mesic, lowland wet, montane dry, montane mesic, montane wet, subalpine, dry cliff, and wet cliff) on Molokai and Maui, the results of the studies described above suggest that pigs can also alter these ecosystems and directly damage or destroy native plants.

Feral goats thrive on a variety of food plants, and are instrumental in the decline of native vegetation in many areas (Cuddihy and Stone 1990, p. 64). Feral goats trample roots and seedlings, cause erosion, and promote the invasion of alien plants. They are able to forage in extremely rugged terrain and have a high reproductive capacity (Clarke and Cuddihy 1980, p. C–20; van Riper and van Riper 1982, pp. 34–35; Tomich 1986, pp. 153–156; Cuddihy and Stone 1990, p. 64). Goats were observed to browse on native plant species in the following genera: *Argyroxiphium, Canavalia, Plantago, Schiedea,* and *Stenogyne* (Cuddihy and Stone 1990, p. 64). A study on the island of Hawaii demonstrated that *Acacia koa* seedlings are unable to survive due to browsing and grazing by goats (Spatz and Mueller-Dombois 1973, p. 874). If goats are maintained at constantly high numbers, mature trees will eventually die, and with them the root systems that support suckers and vegetative reproduction. One study demonstrated a positive height-growth response of *Acacia koa* suckers to the 3-year exclusion of goats (1968–1971) inside a fenced area, whereas suckers were similarly abundant, but very small, outside of the fenced area (Spatz and Mueller-Dombois 1973, p. 873). Another study at Puuwaawaa on the island of Hawaii demonstrated that prior to management actions in 1985, regeneration of endemic shrubs and trees in the goat-grazed area was almost totally lacking, contributing to the invasion of the forest understory by exotic grasses and weeds. After the removal of grazing animals in 1985, *A. koa* and *Metrosideros* spp. seedlings were observed germinating by the thousands (HDLNR 2002, p. 52). Based on a comparison of fenced and unfenced areas, it is clear that goats can devastate native ecosystems (Loope *et al.* 1988, p. 277). As goats occur in nine of the described ecosystems (coastal, lowland dry, lowland mesic, lowland wet, montane dry, montane mesic, montane wet, dry cliff, and wet cliff), on Molokai, Lanai, and Maui, the results of the studies described above suggest that goats can also alter these ecosystems and directly damage or destroy native plants.

Axis deer were introduced to Molokai in 1868, Lanai in 1920, and Maui in 1959. Most of the available information on axis deer in the Hawaiian Islands concerns observations and reports from the island of Maui. On Maui, axis deer were introduced as a game animal, but their numbers have steadily increased, especially in recent years on Haleakala (Luna 2003, p. 44). During the 4-year El Niño drought from 1998 through 2001, Maui experienced an 80 to 90 percent decline in shrub and vine species caused by deer browsing and girdling of young saplings. High mortality of rare and native plant species was observed (Medeiros 2010, pers. comm.). Axis deer consume progressively less palatable plants until no edible vegetation is left (Hess 2008, p. 3). Axis deer are highly adaptable to changing conditions, and are characterized as ''plastic'' (meaning flexible in their behavior) by Ables (1977, cited in Anderson in litt. 1999, p. 5). They exhibit a high degree of opportunism regarding their choice of forage (Dinerstein 1987, cited in Anderson 1999, p. 5) and can be found in all but the highest elevation ecosystems (subalpine and alpine) and montane bogs, according to Medeiros (2010, pers. comm.).

Axis deer on Maui follow a cycle of grazing and browsing in open lowland grasslands during the rainy season (November–March) and then migrate to the lava flows of montane mesic forests during the dry summer months to graze

and browse native plants (Medeiros 2010, pers. comm.). Axis deer favor the native plants *Abutilon menziesii* (an endangered species), *Erythrina sandwicensis* (wiliwili), and *Sida fallax* (ilima) (Medeiros 2010, pers. comm.). During the driest months of summer (July-August), axis deer can be found along Maui's coastal roads as they search for food. Hunting pressure appears to drive the deer into native forests, particularly the lower rainforests up to 4,000 to 5,000 ft (1,220 and 1,525 m) in elevation (Medeiros 2010, pers. comm.), and according to Kessler and Hess (2010, pers. comms.) axis deer can be found up to 9,000 ft (2,743 m) elevation.

Other native Hawaiian plant species have been reported as grazed and browsed by axis deer. For example, on Lanai, grazing by axis deer has been reported as a major threat to the endangered *Gardenia brighamii* (nau) (Mehrhoff 1993, p. 11), and on Molokai, browsing by axis deer has been reported on *Erythrina sandwicensis* and *Nototrichium sandwicense* (kului) (Medeiros *et al.* 1996, pp. 11, 19). Swedberg and Walker (1978, cited in Anderson 2003, pp. 124–125) reported that in the upper forests of Lanai, the native plants *Osteomeles anthyllidifolia* (uulei) and *Leptecophylla tameiameiae* (pukiawe) comprised more than 30 percent of axis deer rumen volume. Other native plant species consumed by axis deer include *Abutilon menziesii* and *Geranium multiflorum* (nohoanu) (both endangered species); the species *Bidens campylotheca* ssp. *pentamera* and *B. campylotheca* ssp. *waihoiensis,* which are proposed for listing in this rule; and *Achyranthes splendens* (NCN), *Chamaesyce lorifolia* (akoko), *Diospyros sandwicensis* (lama), *Lipochaeta rockii* var. *dissecta* (nehe), *Osmanthus sandwicensis* (ulupua), *Panicum torridum* (kakonakona), and *Santalum ellipticum* (laau ala) (Anderson 2002, poster; Perlman 2009c, in litt., pp. 4–5). As axis deer occur in nine of the described ecosystems on Molokai, Lanai, and Maui (coastal, lowland dry, lowland mesic, lowland wet, montane dry, montane mesic, montane wet, dry cliff, and wet cliff), the results from the studies above, in addition to the direct observations from field biologists, suggest that axis deer can also alter these ecosystems and directly damage or destroy native plants.

Mouflon sheep graze native vegetation, trample undergrowth, spread weeds, and cause erosion. On the island of Hawaii, mouflon browsing led to the decline in the largest population of the endangered *Argyroxiphium kauense* (kau silversword, Mauna Loa silversword, or ahinahina) located on the former Kahuku Ranch, reducing it from a ''magnificent population of several thousand'' (Degener *et al.* 1976, pp. 173–174) to fewer than 2,000 individuals (unpublished data in Powell 1992, in litt., p. 312) over a period of 10 years (1974–1984). The native tree *Sophora chrysophylla* is also a preferred browse species for mouflon. According to Scowcroft and Sakai (1983, p. 495), mouflon eat the shoots, leaves, flowers, and bark of this species. Bark stripping on the thin bark of a young tree is potentially lethal. Mouflon are also reported to strip bark from *Acacia koa* trees (Hess 2008, p. 3) and to seek out the threatened plant *Silene hawaiiensis* (Benitez *et al.* 2008, p. 57). In the Kahuku section of Hawaii Volcanoes National Park, mouflon sheep jumped the park boundary fence and reduced one population of *S. hawaiiensis* to half its original size over a 3-year period (Belfield and Pratt 2002, p. 8). Other native species browsed by mouflon include *Geranium cuneatum* ssp. *cuneatum* (hinahina, silver geranium), *G. cuneatum* ssp. *hypoleucum* (hinahina, silver geranium), and *Sanicula sandwicensis* (NCN) (Benitez *et al.* 2008, pp. 59, 61). On Lanai, mouflon sheep were once cited as one of the greatest threats to the endangered *Gardenia brighamii* (Mehrhoff 1993, p. 11), although fencing has now proven to be an effective mechanism against mouflon herbivory on this plant (Mehrhoff 1993, pp. 22–23). While mouflon sheep were introduced to the islands of Lanai and Hawaii as a managed game species, a private game ranch on Maui has added mouflon to its stock and it is likely that over time some individuals may escape (Hess 2010, pers. comm.; Kessler 2010, pers. comm.). As mouflon occur in seven of the described ecosystems (coastal, lowland dry, lowland mesic, lowland wet, montane wet, dry cliff, and wet cliff) on Lanai, the data from the studies above, in addition to direct observation of field biologists, suggest that mouflon can also alter these ecosystems and directly damage or destroy native plants.

Cattle, either feral or domestic, are considered one of the most important factors in the destruction of Hawaiian forests (Baldwin and Fagerlund 1943, pp. 118–122). Captain George Vancouver of the British Royal Navy is attributed with introducing cattle to the Hawaiian Islands in 1793 (Fischer 2007, p. 350) by way of a gift to King Kamehameha I on the island of Hawaii. Over time, cattle became established on all of the main Hawaiian Islands, and historically feral cattle were found on the islands of Kauai, Oahu, Molokai, Maui, Kahoolawe, and Hawaii. Currently, feral cattle are found only on Maui and Hawaii, typically in accessible forests and certain coastal and lowland leeward habitats (Tomich 1986, pp. 140–144). In Hawaii Volcanoes National Park on the island of Hawaii, Cuddihy reported that there were twice as many native plant species as nonnatives found in areas that had been fenced to exclude feral cattle, whereas on the adjacent, nonfenced cattle ranch, there were twice as many nonnative plant species as natives (Cuddihy 1984, pp. 16, 34). Skolmen and Fujii (1980, pp. 301–310) found that *Acacia koa* seedlings were able to reestablish in a moist *Acacia koa-Metrosideros polymorpha* forest on Hawaii Island after the area was fenced to exclude feral cattle (Skolmen and Fujii 1980, pp. 301–310). Cattle eat native vegetation, trample roots and seedlings, cause erosion, create disturbed areas conducive to invasion by nonnative plants, and spread seeds of nonnative plants in their feces and on their bodies. As feral cattle occur in five of the described ecosystems (lowland dry, lowland mesic, lowland wet, montane mesic, and montane wet) on Maui, the results from the above studies, in addition to the direct observations from field biologists, suggest that feral cattle can alter these ecosystems and directly damage or destroy native plants.

The blackbuck antelope (*Antelope cervicapra*) is an endangered antelope from India brought to a private game reserve on Molokai about 10 years ago from an Indian zoo (Kessler 2010, pers. comm.). According to Kessler (2010, pers. comm.), at some time in the last 10 years, a few individuals escaped from the game reserve and established a wild population of an unknown number of individuals on the lower, dry plains of western Molokai. Blackbuck primarily use grassland habitat for grazing. In India, foraging consumption and nutrient digestibility are high in the moist winter months and low in the dry summer months (Jhala 1997, pp. 1,348; 1,351). Although most plant species are grazed intensely when they are green, some are grazed only after they are dry (Jhala 1997, pp. 1,348; 1,351). While the habitat effects from the blackbuck antelope are unknown at this time, we consider these ungulates a potential threat to native plant species, including the 10 plant species found on Molokai (Kessler 2010, pers. comm.), because blackbuck antelope have foraging and grazing habits similar to feral goats, cattle, axis deer and mouflon.

Other Introduced Vertebrates

Rats

There are three species of introduced rats in the Hawaiian Islands. Studies of Polynesian rat (*Rattus exulans*) DNA suggest they first appeared in the Hawaiian Islands along with emigrants from the Marquesas about 400 A.D., with a second interaction around 1100 A.D (Ziegler 2002, p. 315). The black rat (*R. rattus*) and the Norway rat (*R. norvegicus*) most likely arrived in the Hawaiian Islands more recently, as stowaways on ships sometime in the late 19th century (Atkinson and Atkinson 2000, p. 25). The Polynesian rat and the black rat are primarily found in the wild, in dry to wet habitats, while the Norway rat is typically found in manmade habitats such as urban areas or agricultural fields (Tomich 1986, p. 41). The black rat is widely distributed among the main Hawaiian Islands and can be found in a broad range of ecosystems up to 9,744 ft (2,970 m), but it is most common at low-to mid-elevations (Tomich 1986, pp. 38–40). While Sugihara (1997, p. 194) found both the black and Polynesian rats up to 6,972-ft (2,125-m) elevation on Maui, the Norway rat was not seen at the higher elevations in his study. Rats occur in 9 of the described ecosystems (coastal, lowland dry, lowland mesic, lowland wet, montane dry, montane mesic, montane wet, dry cliff, and wet cliff), and predation by rats threatens 23 of the 37 plant species, and all 3 species of tree snails, proposed or reevaluated for listing (see Table 3).

Rat Impacts on Plants

Rats impact native plants by eating fleshy fruits, seeds, flowers, stems, leaves, roots, and other plant parts (Atkinson and Atkinson 2000, p. 23), and can seriously affect regeneration. Research on rats in forests in New Zealand has also demonstrated that, over time, differential regeneration as a consequence of rat predation may alter the species composition of forested areas (Cuddihy and Stone 1990, pp. 68–69). Rats have caused declines or even the total elimination of island plant species (Campbell and Atkinson 1999, cited in Atkinson and Atkinson 2000, p. 24). In the Hawaiian Islands, rats may consume as much as 90 percent of the seeds produced by some trees, or in some cases prevent the regeneration of forest species completely (Cuddihy and Stone 1990, pp. 68–69). All three species of rat (black, Norway, and Polynesian) have been reported to seriously threaten many endangered and threatened Hawaiian plants (Stone 1985, p. 264; Cuddihy and Stone 1990, pp. 67–69). Plants with fleshy fruits are particularly susceptible to rat predation, including some of the species proposed or reevaluated for listing here. For example, the fruits of plants in the bellflower family (e.g., *Cyanea* spp.) appear to be a target of rat predation (Cuddihy and Stone 1990, pp. 67–69). In addition to all 12 species of *Cyanea* (*Cyanea asplenifolia, C. duvalliorum, C. grimesiana* ssp. *grimesiana, C. horrida, C. kunthiana, C. magnicalyx, C. maritae, C. mauiensis, C. munroi, C. obtusa, C. profuga,* and *C. solanacea*), 11 other species of plants proposed or reevaluated for listing here are threatened by rat predation, including *Bidens campylotheca* ssp. *pentamera, B. campylotheca* ssp. *waihoiensis, B. conjucta* (Bily *et al.* 2003, pp. 1–16), *Mucuna sloanei* var. *persericea, Myrsine vaccinioides, Peperomia subpetiolata, Pittosporum halophilum, Pleomele fernaldii, Santalum haleakalae* var. *lanaiense, Schiedea laui,* and *Wikstroemia villosa* (HBMP 2008; Harbaugh *et al.* 2010, p. 835). As rats occur in nine of the described ecosystems (coastal, lowland dry, lowland mesic, lowland wet, montane dry, montane mesic, montane wet, dry cliff, and wet cliff) on Molokai, Lanai, and Maui, the results from the above studies, in addition to direct observations from field biologists, suggest that rats can directly damage or destroy native plants.

Rat Impacts on Tree Snails

Rats (*Rattus* spp.) have been suggested as the invasive animal responsible for likely the greatest number of animal extinctions on islands throughout the world, including extinctions of various snail species (Towns *et al.* 2006, p. 88). In the Hawaiian Islands, rats are known to prey upon endemic arboreal snails (Hadfield *et al.* 1993, p. 621). In the Waianae Mountains of Oahu, Meyer and Shiels (2009, p. 344) found shells of the endemic Oahu tree snail (*Achatinella mustelina*) with characteristic rat damage (e.g., damage to the shell opening and cone tip), but noted that rat crushing of shells may limit the ability to adequately quantify the threat. On Lanai, Hobdy (1993, p. 208) found numerous shells of *Partulina variabilis,* one of the tree snails proposed for listing, on the ground with damage characteristic of rat predation. Likewise in a 2005 survey on Lanai, Hadfield (2005, pp. 3–4) found shells of *Partulina semicarinata* on the ground with characteristic rat damage; *P. semicarinata* is also proposed for listing. Surveys in 2009 led Hadfield and colleagues to conclude that populations of *Partulina redfieldi* (a tree snail endemic to lowland and montane forests on Molokai) had declined by 85 percent since 1995 due to rat predation (Hadfield and Saufler 2009, p. 1). On Maui, rat predation on the tree snail species *Newcombia cumingi,* which is proposed for listing, has led to a decrease in the number of individuals (Hadfield 2006 in litt., p. 3; 2007, p. 9; 2011, pers. comm.). As rats are found in nine of the described ecosystems on Lanai and Maui (the islands on which *Newcombia cumingi, Partulina semicarinata,* and *P. variabilis* occur), including the three ecosystems (lowland wet, montane wet, and wet cliff) in which the three tree snails proposed for listing are found, the results of the above studies, in addition to direct observations from field biologists, suggest that rats directly damage or destroy Hawaiian tree snails and are a serious and ongoing threat to the three tree snail species proposed for listing here.

Jackson's Chameleon

Several dozen Jackson's chameleons (*Chamaeleo jacksonii*), native to Kenya and Tanzania, were introduced to Hawaii in the early 1970s through the pet trade (Holland *et al.* 2010, p. 1,438). Inter-island transport of Jackson's chameleons for the pet trade was unrestricted until 1997, when they were classified as ''injurious wildlife,'' and export as well as inter-island transport was prohibited (State of Hawaii 1996, H.A.R. 13–124–3; Holland *et al.* 2010, p. 1,439). Currently, there are established populations on all of the main Hawaiian Islands, with the greatest number of individuals on the islands of Hawaii, Maui, and Oahu (Holland *et al.* 2010, p. 1,438). Jackson's chameleons prey on native insects and tree snails, including the endangered Oahu tree snail (*Achatinella mustelina*) (Holland *et al.* 2010, p. 1,438; Hadfield 2011, pers. comm.). Jackson's chameleons may be expanding their range in the wild from low-elevation to higher elevation pristine native forest, which may result in catastrophic impacts to native ecosystems and the species supported by those ecosystems, including the lowland wet ecosystems on Maui and Lanai that support the tree snails *Newcombia cumingi, Partulina semicarinata,* and *P. variabilis,* and the montane wet and wet cliff ecosystems on Lanai that support *P. semicarinata* and *P. variabilis.* Because Jackson's chameleons are likely found in, or expanding their range into, all of the ecosystems in which the three tree snails proposed for listing are found, and are known to prey on tree snails, predation by Jackson's chameleon is a

potentially serious threat to the tree snails *Newcombia cumingi, Partulina semicarinata,* and *P. variabilis.*

Invertebrates

Nonnative Slugs

Predation by nonnative snails and slugs adversely impacts 26 of the 37 plant species (*Bidens campylotheca* ssp. *waihoiensis, B. conjuncta, Cyanea asplenifolia, C. duvalliorum, C. grimesiana* ssp. *grimesiana, C. horrida, C. kunthiana, C. magnicalyx, C. maritae, C. mauiensis, C. munroi, C. obtusa, C. profuga, C. solanacea, Cyrtandra filipes, Geranium hillebrandii, Myrsine vaccinioides, Peperomia subpetiolata, Phyllostegia bracteata, P. haliakalae, P. pilosa, Santalum haleakalae* var. *lanaiense, Schiedea jacobii, S. laui, Stenogyne kauaulaensis,* and *Wikstroemia villosa;* see Table 3) proposed or reevaluated for listing here through mechanical damage, destruction of plant parts, and mortality (Mitchell *et al.* 2005; Joe 2006, p. 10; HBMP 2008; PEPP 2008, pp. 48–49, 52–53, 57, 70; PEPP 2010, pp. 1–121). On Oahu, slugs have been reported to destroy *Cyanea calycina* and *Cyrtandra kaulantha* in the wild, and have been observed eating leaves and fruit of wild and cultivated individuals of *Cyanea* (Mehrhoff 1995, in litt.; U.S. Army Garrison 2005, pp. 3–34, 3–51). In addition, slugs have damaged individuals of other *Cyanea* and *Cyrtandra* species in the wild (Wood 2001, in litt.; Sailer and Kier 2002, in litt., p. 3; PEPP 2007, p. 38; PEPP 2008, pp. 23, 49, 52–53, 57).

Little is known about predation of certain rare plants by slugs; however, information in the U.S. Army's 2005 ''Status Report for the Makua Implementation Plan'' indicates that slugs can be a threat to all species of *Cyanea* (U.S. Army Garrison 2005, p. 3–51). Research investigating slug herbivory and control methods shows that slug impacts on seedlings of *Cyanea* spp. results in up to 80 percent seedling mortality (U.S. Army Garrison 2005, p. 3–51). Slug damage has also been reported on other Hawaiian plants including *Argyroxiphium grayanum* (greensword), *Alsinidenron* sp., *Hibiscus* sp., *Schiedea kaalae* (maolioli), *Solanum sandwicense* (popolo aiakeakua), and *Urera* sp. (Gagne 1983, p. 190–191; Sailer, pers. comm. cited in Joe 2006, pp. 28–34).

Joe and Daehler (2008, p. 252) found that native Hawaiian plants are more vulnerable to slug damage than nonnative plants. In particular, they found that the individuals of the endangered plants *Cyanea superba* and *Schiedea obovata* had 50 percent higher mortality when exposed to slugs when compared to individuals of the same species that were protected within slug exclosures. As slugs are found in eight of the described ecosystems (lowland dry, lowland mesic, lowland wet, montane dry, montane mesic, montane wet, dry cliff, and wet cliff) on Molokai, Lanai, and Maui, the data from the above studies, in addition to direct observations from field biologists, suggest that slugs can directly damage or destroy native plants.

Nonnative Snails

Several species of nonnative snails have been inadvertently introduced to Hawaii. However, in 1955, the rosy wolf snail (*Euglandina rosea*) was purposely introduced to Hawaii from Florida in an attempt to control another nonnative, the giant African snail (*Achatina fulica*). The giant African snail is commonly found in Honolulu gardens and is one of the largest snails in the world, in addition to being recognized as one of the world's most damaging pests to crop plants (Peterson 1957, pp. 643–658; Stone and Anderson 1988, p. 134). The rosy wolf snail is now found on all of the main Hawaiian Islands and has expanded its range on those islands to include cooler, mid-elevation forests where many endemic tree snails are found. This nonnative snail is likely responsible for the decline and extinction of many of Hawaii's native tree snails (Stone and Anderson 1988, p. 134; Hadfield *et al.* 1993, p. 621; Hadfield 2010a, in litt.). In 1979, the rosy wolf snail decimated a population of the endangered Oahu tree snail (*Achatinella mustelina*), as well as all other tree snails at the same study site (Hadfield and Mountain 1980, p. 357). According to Hadfield (2007, pp. 6–9), the rosy wolf snail is currently the greatest threat to the only known population of *Newcombia cumingi,* proposed for listing here. In addition, the nonnative garlic snail (*Oxychilus alliarius*), a predator on the smaller achatinellid snails, may be a potential threat to *Newcombia cumingi* (Hadfield 2010a, in litt.). Hadfield (2007, pp. 6–9) reported finding many shells of the garlic snail within the habitat of *N. cumingi* on Maui. As the rosy wolf snail can be found in three of the described ecosystems (lowland wet, montane wet, and wet cliff) on Lanai and Maui (the islands on which *N. cumingi, Partulina semicarinata,* and *P. variabilis* occur), the results from the studies above, in addition to observations by field biologists, suggest that the rosy wolf snail has the potential to severely impact the three tree snails proposed for listing in this rule.

Nonnative Flatworms

The extinction of native land snails on several Pacific Islands has been attributed to the terrestrial flatworm *Platydemus manokwari* (Sugiura 2010, p. 1,499). This flatworm has decimated populations of native tree snails on Guam (Hopper and Smith 1992, pp. 78, 82–83). In the Hawaiian Islands, *Platydemus manokwari* has been found on the islands of Oahu and Hawaii, and is likely on all of the main islands (Miller 2011, pers. comm.). Although *P. manokwari* has not been reported from the same locations as the three tree snails proposed for listing, it is a potential threat to these species because it likely co-occurs on the islands of Molokai, Lanai, and Maui, and it is a known predator on tree snails.

Summary of Disease or Predation

We are unaware of any information that indicates that disease is a threat to the 37 plant species. Disease is a potential threat to the three species of tree snails proposed for listing, as recovery of these species likely will include captive propagation and disease is suspected to be a cause of currently unsuccessful captive propagation of *Newcombia cumingi, Partulina semicarinata,* and *P. variabilis.* However, at this time, we have no evidence to suggest that disease is acting on the wild populations such that it may be considered a contributing factor that has led to their endangerment; therefore we cannot conclude that any of these three tree snails species is endangered because of disease.

We consider predation by nonnative animal species (pigs, goats, axis deer, mouflon sheep, cattle, rats, Jackson's chameleon, slugs, snails, and flatworms) to pose an ongoing threat to all 40 species proposed or reevaluated for listing throughout their ranges for the following reasons:

(1) Observations and reports have documented that pigs, goats, axis deer, mouflon sheep, and cattle browse and trample 35 of the 37 plant species (see Table 3), in addition to other studies demonstrating the negative impacts of ungulate browsing and trampling on native plant species of the islands (Spatz and Mueller-Dombois 1973, p. 874; Diong 1982, p. 160; Cuddihy and Stone 1990, p. 67).

(2) Nonnative rats and slugs cause mechanical damage to plants and destruction of plant parts (branches, fruits, and seeds), and are considered a threat to 30 of the 37 plant species proposed or reevaluated for listing (see

Table 3). All 40 species proposed or reevaluated for listing are impacted by either introduced ungulates, as noted in item 1, above, or nonnative rats and slugs, or both.

(3) Rat damage has been observed on shells of dead individuals of the tree snails *Partulina variabilis* and *P. semicarinata* on Lanai, as well as on other native tree snails on Oahu and Molokai, indicating rats are a likely cause of mortality of these species. Predation by rats has been linked with the dramatic declines of some populations of native tree snails (Hobdy 1993, p. 208; Hadfield and Saufler 2009, p. 1; Meyer and Shields 2009, p. 344). Rat predation has been documented on the tree snail species *Newcombia cumingi* (Hadfield 2006 in litt., p. 3; Hadfield 2007, p. 9; Hadfield 2010a, in litt.). Because rats are found in all of the ecosystems in which the three tree snails proposed for listing are found, and rats are known to prey on tree snails, we consider predation by rats to be a serious and ongoing threat to *Newcombia cumingi, Partulina semicarinata,* and *P. variabilis.*

(4) Jackson's chameleon, which preys on native insects and tree snails, has established populations in the wild on all the main Hawaiian Islands. Jackson's chameleon is likely found in, or is in the process of expanding its range to include, all of the ecosystems which support the three tree snails proposed for listing. Predation by this nonnative reptile is a potentially serious threat to *Newcombia cumingi, Partulina semicarinata,* and *P. variabilis.*

(5) Hawaiian tree snails are vulnerable to predation by the nonnative rosy wolf snail, which is found on all the main Hawaiian Islands and whose range likely overlaps that of the three tree snail species proposed for listing. We therefore consider *Newcombia cumingi, Partulina semicarinata,* and *P. variabilis* to be threatened by predation by the nonnative rosy wolf snail. In addition, the nonnative garlic snail may be a potential threat to the proposed *N. cumingi* because it is a known predator on smaller tree snails in the same family as *N. cumingi* and shells of the garlic snail have been found in *N. cumingi* habitat (Stone and Anderson 1988, p. 134; Hadfield *et al.* 1993, p. 621; Hadfield 2010a, in litt.).

(6) The nonnative flatworm, *Platydemus manokwari,* is a potential threat to all three species of tree snails proposed for listing (Hadfield 2010b, in litt.; Sugiura 2010, pp. 1,499–1,501) because this flatworm has decimated native tree snail populations on other Pacific Islands and likely occurs on all the main Hawaiian Islands, including the islands of Lanai and Maui, where the three tree snails are found.

These threats are serious and ongoing, act in concert with other threats to the species, and are expected to continue or increase in magnitude and intensity into the future without effective management actions to control or eradicate them. In addition, negative impacts to native Hawaiian plants on Molokai from grazing and browsing by the blackbuck antelope are likely should this nonnative ungulate increase in numbers and range on the island. The combined threat of ungulate, rat, and invertebrate predation on native Hawaiian flora and fauna suggests the need for immediate implementation of recovery and conservation methodologies.

D. The Inadequacy of Existing Regulatory Mechanisms

Inadequate Habitat Protection

Currently, there are no existing Federal, State, or local laws, treaties, or regulations that specifically conserve or protect the 40 species proposed or reevaluated for listing in this rule, or adequately address the threats described in this proposed rule. Although the State of Hawaii's Plant Extinction Prevention Program supports conservation of the plant species by securing seeds or cuttings from the rarest and most critically endangered native species for propagation, the program is non-regulatory and has not yet been able to directly address broad-scale threats to plants by invasive species.

Nonnative ungulates pose a major ongoing threat to 35 of the 37 plant species through destruction and degradation of terrestrial habitat, and through direct predation of 35 of the plant species (see Table 3). The State of Hawaii provides game mammal (feral pigs and goats, axis deer, and mouflon sheep) hunting opportunities on 15 State-designated public hunting areas on the islands of Molokai, Lanai, and Maui (State of Hawaii 1999, H.A.R. 13–123; HDLNR 2009, pp. 20–21). The State's management objectives for game animals range from maximizing public hunting opportunities (e.g., ''sustained yield'') in some areas to removal by State staff, or their designees, in other areas (State of Hawaii, H.A.R. 13–123). Thirty-four of the 37 plant species have populations in areas where terrestrial habitat may be manipulated for game enhancement and game populations are maintained at prescribed levels using public hunting (HBMP 2008; State of Hawaii, H.A.R. 13–123). Public hunting areas are not fenced, and game mammals have unrestricted access to most areas across the landscape, regardless of underlying land-use designation. While fences are sometimes built to protect areas from game mammals, the current number and locations of fences are not adequate to prevent habitat degradation and destruction for 37 of the 40 species, and the direct predation of 35 of the 37 plant species on Molokai, Lanai, and Maui (see Table 3).

The capacity of Federal and State agencies and their nongovernmental partners in Hawaii to mitigate the effects of introduced pests, such as ungulates and weeds, is limited due to the large number of taxa currently causing damage (Coordinating Group on Alien Pest Species (CGAPS) 2009). Many invasive weeds established on Molokai, Lanai, and Maui have currently limited but expanding ranges and are of concern. Resources available to reduce the spread of these species and counter their negative ecological effects are limited. Control of established pests is largely focused on a few invasive species that cause significant economic or environmental damage to public and private lands. Comprehensive control of an array of invasive pests and management to reduce disturbance regimes that favor certain invasive species remains limited in scope. If current levels of funding and regulatory support for invasive species control are maintained on Molokai, Lanai, and Maui, the Service expects existing programs to continue to exclude or, on a very limited basis, control invasive species only in high-priority areas. Threats from established pests (e.g., nonnative ungulates, weeds, and invertebrates) are ongoing and expected to continue into the future.

Inadequate Protection From Introduction of Nonnative Species

Currently, four agencies are responsible for inspection of goods arriving in Hawaii (CGAPS 2009). The Hawaii Department of Agriculture (HDOA) inspects domestic cargo and vessels and focuses on pests of concern to Hawaii, especially insects or plant diseases not yet known to be present in the State. The U.S. Department of Homeland Security-Customs and Border Protection (CBP) is responsible for inspecting commercial, private, and military vessels and aircraft and related cargo and passengers arriving from foreign locations. CBP focuses on a wide range of quarantine issues involving non-propagative plant materials (processed and unprocessed); wooden packing materials, timber, and products; internationally regulated commercial species under the Convention in

International Trade in Endangered Species (CITES); federally listed noxious seeds and plants; soil; and pests of concern to the greater United States, such as pests of mainland U.S. forests and agriculture. The U.S. Department of Agriculture-Animal and Plant Health Inspection Service-Plant Protection and Quarantine (USDA–APHIS–PPQ) inspects propagative plant material, provides identification services for arriving plants and pests, conducts pest risk assessments, trains CBP personnel, conducts permitting and preclearance inspections for products originating in foreign countries, and maintains a pest database that, again, has a focus on pests of wide concern across the United States (HDOA 2009). The Service inspects arriving wildlife products, enforces the injurious wildlife provisions of the Lacey Act (18 U.S.C. 42; 16 U.S.C. 3371 *et seq.*), and prosecutes CITES violations.

The State of Hawaii's unique biosecurity needs are not recognized by Federal import regulations. Under the USDA–APHIS–PPQ's commodity risk assessments for plant pests, regulations are based on species considered threats to the mainland United States and do not address many species that could be pests in Hawaii (Hawaii Legislative Reference Bureau (HLRB 2002; USDA–APHIS–PPQ 2010; CGAPS 2009). Interstate commerce provides the pathway for invasive species and commodities infested with non-federal quarantine pests to enter Hawaii. Pests of quarantine concern for Hawaii may be intercepted at Hawaiian ports by Federal agents but are not always acted on by them because these pests are not regulated under Federal mandates. Hence, Federal protection against pest species of concern to Hawaii has historically been inadequate. It is possible for the USDA to grant Hawaii protective exemptions under the ''Special Local Needs Rule,'' when clear and comprehensive arguments for both agricultural and conservation issues are provided; however, this exemption procedure operates on a case-by-case basis and is extremely time-consuming to satisfy. Therefore, that avenue may only provide minimal protection against the large diversity of foreign pests that threaten Hawaii.

Adequate staffing, facilities, and equipment for Federal and State pest inspectors and identifiers in Hawaii devoted to invasive species interdiction are critical biosecurity gaps (HLRB 2002; USDA–APHIS–PPQ 2010; CGAPS 2009). State laws have recently been passed that allow the HDOA to collect fees for quarantine inspection of freight entering Hawaii (e.g., Act 36 (2011) H.R.S. 150A–5.3). Legislation enacted in 2011 (H.B. 1568) requires commercial harbors and airports in Hawaii to provide biosecurity and to facilitate cargo inspections. The introduction of new pests to the State of Hawaii is a significant risk to federally listed species.

Nonnative Animal Species

Vertebrate Species

The State of Hawaii's laws prohibit the importation of all animals unless they are specifically placed on a list of allowable species (HLRB 2002; CGAPS 2010). The importation and interstate transport of invasive vertebrates is federally regulated by the Service under the Lacey Act as ''injurious wildlife'' (Fowler *et al.* 2007, pp. 353 – 359); the current list of vertebrates considered as ''injurious wildlife'' is provided at 50 CFR 16. The law in its current form has limited effectiveness in preventing invasive vertebrate introductions into the State of Hawaii.

Invertebrate Species

Predation by nonnative invertebrate pests (flatworms, slugs, snails) adversely impacts 26 of the plant species and the 3 tree snails proposed or reevaluated for listing in this rule (see Table 3). It is likely that the introduction of most nonnative invertebrate pests to the State has been and continues to be accidental and incidental to other intentional and permitted activities. Although Hawaii State government and Federal agencies have regulations and some controls in place (see above), the introduction and movement of nonnative invertebrate pest species between islands and from one watershed to the next continues. For example, an average of 20 new alien invertebrate species were introduced to Hawaii per year since 1970, an increase of 25 percent over the previous totals between 1930 and 1970 (TNCH 1992, p. 8). Existing regulatory mechansisms therefore appear inadequate to ameliorate the threat of introductions of nonnative invertebrates, and we have no evidence to suggest that any change to this situation is anticipated in the future.

Nonative Plant Species

Nonnative plants destroy and modify habitat throughout the ranges of 36 of the 40 species being addressed in this proposed rule (see Table 3, above). As such, they represent a serious and ongoing threat to each of these species. In addition, nonnative plants have been shown to outcompete native plants and convert native-dominated plant communities to nonnative plant communities (See ''Habitat Destruction and Modification by Nonnative Plants,'' above).

The State of Hawaii allows the importation of most plant taxa, with limited exceptions, if shipped from domestic ports (HLRB 2002; USDA–APHIS–PPQ 2010; CGAPS 2009). Hawaii's plant import rules (H.A.R. 4–70) regulate the importation of 13 plant taxa of economic interest; regulated crops include pineapple, sugarcane, palms, and pines. Certain horticultural crops (e.g., orchids) may require import permits and have pre-entry requirements that include treatment or quarantine or both either prior to or following entry into the State. The State noxious weed list (H.A.R. 4–68) and USDA–APHIS–PPQ's Restricted Plants List restrict the import of a limited number of noxious weeds. If not specifically prohibited, current Federal regulations allow plants to be imported from international ports with some restrictions. The Federal Noxious Weed List (see 7 CFR 360.200) includes few of the many globally known invasive plants, and plants in general do not require a weed risk assessment prior to importation from international ports. The USDA–APHIS–PPQ is in the process of finalizing rules to include a weed risk assessment for newly imported plants. Although the State has general guidelines for the importation of plants, and regulations are in place regarding the plant crops mentioned above, the intentional or inadvertent introduction of nonnative plants outside the regulatory process and movement of species between islands and from one watershed to the next continues, and represent a threat to native flora for the reasons described above. In addition, government funding is inadequate to provide for sufficient inspection services and monitoring.

In 1995, CGAPS, a partnership comprised primarily of managers from every major Federal, State, County, and private agency and organization involved in invasive species work in Hawaii, was formed in an effort to improve communication, increase collaboration, and promote public awareness (CGAPS 2009). This group facilitated the formation of the Hawaii Invasive Species Council (HISC), which was created by gubernatorial executive order in 2002, to coordinate local initiatives for the prevention and control of invasive species by providing policy level direction and planning for the State departments responsible for invasive species issues. In 2003, the Governor signed into law Act 85, which conveys statutory authority to the HISC to continue to coordinate approaches among the various State and Federal

agencies, and international and local initiatives for the prevention and control of invasive species (HDLNR 2003, p. 3–15; HISC 2009; H.R.S. 194–2(a)). Some of the recent priorities for the HISC include interagency efforts to control nonnative species such as the plants *Miconia calvescens* (miconia) and *Cortaderia* spp. (pampas grass), coqui frogs (*Eleutherodactylus coqui*), and ants (HISC 2009). In early 2009, HISC projected that, due to a tighter economy in Hawaii and anticipated budget cuts in State funding support of up to 50 percent, there will be a serious setback in conservation achievements, and the loss of experienced, highly trained staff (HISC 2009).

On the basis of the above information, existing regulatory mechanisms do not adequately protect the 40 species being addressed in this proposed rule from the threat of new introductions of nonnative species, and the continued expansion of nonnative species populations on and between islands and watersheds. Nonnative species may prey upon, modify or destroy habitat, or directly compete with one or more of the 40 species for food, space, and other necessary resources. Because current Federal, State, and local laws, treaties, and regulations are inadequate to prevent the introduction and spread of nonnative species from outside the State of Hawaii, as well as between islands and watersheds, the impacts from these introduced threats are ongoing and are expected to continue into the future.

Summary of Inadequacy of Existing Regulatory Mechanisms

We consider the threat of inadequate regulatory mechanisms to be ongoing and we expect it to continue into the future, for the following reasons:

(1) The State's current management of nonnative game mammals is inadequate to prevent the degradation and destruction of habitat of 35 of the 37 plant species (Factor A) and predation of 35 of the 37 plant species (Factor C).

(2) Existing State and Federal regulatory mechanisms are not effectively preventing the introduction and spread of nonnative species from outside the State of Hawaii and between islands and watersheds within the State of Hawaii. Habitat-altering nonnative plant species (Factor A) and predation by nonnative animal species (Factor C) pose a major ongoing threat to all 40 species proposed or reevaluated for listing in this proposed rule.

Information indicates that the existing regulatory mechanisms are inadequate to prevent the spread of nonnative species and to provide for the maintenance of habitat for the 40 species proposed or reevaluated for listing under the Act. The inadequacy of existing regulatory mechanisms is considered a serious threat, both now and into future, to all 40 species proposed or reevaluated for listing.

E. Other Natural or Manmade Factors Affecting Their Continued Existence

Other factors threatening some or all of the 40 species include small numbers of populations and small population sizes, hybridization, lack of regeneration, and human trampling as a result of hiking and other activities. Each threat is discussed in detail below, along with identification of which species are affected by these threats.

Small Number of Individuals and Populations

Species that are endemic to single islands are inherently more vulnerable to extinction than are widespread species, because of the increased risk of genetic bottlenecks, random demographic fluctuations, climate change effects, and localized catastrophes such as hurricanes, landslides, rockfalls, drought, and disease outbreaks (Pimm *et al.* 1988, p. 757; Mangel and Tier 1994, p. 607). These problems are further magnified when populations are few and restricted to a very small geographic area, and when the number of individuals in each population is very small. Populations with these characteristics face an increased likelihood of stochastic extinction due to changes in demography, the environment, genetics, or other factors (Gilpin and Soulé 1986, pp. 24–34). Small, isolated populations often exhibit reduced levels of genetic variability, which diminishes the species' capacity to adapt and respond to environmental changes, thereby lessening the probability of long-term persistence (e.g., Barrett and Kohn 1991, p. 4; Newman and Pilson 1997, p. 361). Very small, isolated populations are also more susceptible to reduced reproductive vigor due to ineffective pollination (plants), inbreeding depression (plants and snails), and hybridization (plants). The problems associated with small population size and vulnerability to random demographic fluctuations or natural catastrophes are further magnified by synergistic interactions with other threats, such as those discussed above (see Factors A and C, above).

Plants

The following 20 plant species in this proposal are threatened by limited numbers (that is, they total fewer than 50 individuals): *Cyanea grimesiana* ssp. *grimesiana, C. horrida, C. magnicalyx, C. maritae, C. mauiensis, C. munroi, C. obtusa, C. profuga, C. solanacea, Cyrtandra ferripilosa, Festuca molokaiensis, Peperomia subpetiolata, Phyllostegia bracteata, P. haliakalae, P. pilosa, Pittosporum halophilum, Schiedea jacobii, S. laui, Stenogyne kauaulaensis,* and *Wikstroemia villosa.* We consider these species highly vulnerable to extinction due to threats associated with small population size because:

- *Cyanea grimesiana* ssp. *grimesiana* has not been observed since 1991 on Molokai (PEPP 2010, p. 45).
- The only known wild occurrences of *Cyanea horrida, C. magnicalyx, C. maritae,* and *C. munroi* are threatened either by flooding, landslides, or tree falls, or a combination of these, because of their locations in lowland wet, montane wet, and wet cliff ecosystems (TNC 2007; TNCH 2010a; HBMP 2008; PEPP 2009, pp. 23–24, 49–58).
- The last confirmed observation of *Cyanea mauiensis* in the wild was over 100 years ago. Botanists believe individuals of this species still remain, as potentially suitable habitat has not been searched. There are no tissues, propagules, or seeds in storage or propagation (Lammers 2004, pp. 84–85; TNC 2007).
- *Cyanea obtusa* is highly threatened by feral pigs, goats, axis deer, and cattle, and the only two known individuals of this species are not protected from direct predation or from fire (Lau 2001, in litt.; PEPP 2007, p. 40; HBMP 2008; PEPP 2008, p. 55; Duvall 2010, in litt.).
- *Cyanea profuga* and *C. solanacea* are known from fewer than five scattered occurrences that are threatened by habitat destruction or direct predation by nonnative pigs and goats, as well as by landslides, rock and tree falls, or flooding, or a combination of these, in the montane wet ecosystem (HBMP 2008; PEPP 2009, pp. 23–24, 49–58; Bakutis 2010, in litt.; Perlman 2010, in litt.; Oppenheimer 2010a, in litt.; TNCH 2011, pp. 21, 57).
- *Cyrtandra ferripilosa* is known from two disparate occurrences totaling only a few individuals that are not protected from direct predation by nonnative pigs and goats (Oppenheimer 2010f, in litt.; Welton 2010b, in litt.).
- *Festuca molokaiensis,* known only from its original collection location on Molokai, has not been relocated for 2 years. Threats to this species include habitat destruction or direct predation by nonnative goats, nonnative plants, and fire (Oppenheimer 2011a, pers. comm.).
- Historically known from lower Waikamoi on east Maui, the

identification of wild individuals of *Peperomia subpetiolata* has not been confirmed since 2001, although hybrids between this species and other species of *Peperomia* are reported in this area (HBMP 2008; NTBG 2009g, p. 2; Oppenheimer 2010a, in litt.; PEPP 2010, p. 96).

• Only one individual of *Phyllostegia bracteata* was known as recently as 2009, but even this single individual was not relocated later in the same year. Botanists continue to search potentially suitable habitat near the last known location for this ephemeral species (NTBG 2009h, p. 3; PEPP 2009, pp. 89–90; Oppenheimer 2010c, in litt.).

• The last known wild individual of *Phyllostegia haliakalae* on Maui had died by 2010, although there are outplantings of this species near the location of this individual. Botanists continue to search potentially suitable habitat on Maui for this species. *Phyllostegia haliakalae* has not been relocated on Molokai or Lanai for close to 100 years (TNC 2007; HBMP 2008; Oppenheimer 2010c, in litt.; Oppenheimer 2011b, in litt.).

• The seven known individuals of *Phyllostegia pilosa* are not protected from direct predation by feral pigs and goats on Maui. This species has not been observed on Molokai for over 100 years (TNC 2007; HBMP 2008).

• *Pittosporum halophilum* is known from three disparate locations, each with one to three individuals, on Molokai and its offshore islets. These individuals are not protected from predation by feral pigs or rats, or from the threat of fire (Wood 2005, pp. 2, 41; Bakutis 2010, in litt.; Hobdy 2010, in litt.; Perlman 2010, in litt.).

• The only known wild individuals of *Schiedea jacobii* were likely destroyed by landslides because of their location in the montane wet ecosystem. The State plans to outplant propagated individuals in Hanawi Natural Area Reserve in 2011 (Wagner *et al.* 1999j, p. 286; HBMP 2008; Oppenheimer 2010a, in litt., Perlman 2010, in litt.).

• The 24 to 34 individuals of *Schiedea laui* are threatened by flooding and landslides due to their location in a grotto (HBMP 2008; Bakutis 2010, in litt.).

• *Stenogyne kauaulaensis* is only known from three individuals located on steep slopes. These plants are imminently threatened by landslides and rockfalls, in addition to drought and fire in the montane mesic ecosystem on west Maui (Wood and Oppenheimer 2008, pp. 544–545; Oppenheimer 2010a, in litt.).

• *Wikstroemia villosa* is known only from a single occurrence, with two individuals (Peterson 1999, p. 1,291; TNC 2007; HBMP 2008; Oppenheimer 2010a, in litt.).

Tree Snails

Like most native island biota, the endemic Hawaiian tree snails are particularly sensitive to disturbances due to low population numbers and small geographic ranges (Hadfield *et al.* 1993, p. 610). We consider the three tree snail species vulnerable to extinction due to threats associated with low numbers of individuals and populations because:

• *Newcombia cumingi* is known only from a single wild population of nine individuals and has not been successfully maintained in captivity (Hadfield 2007, pp. 2, 8; Hadfield 2008, p. 10).

• The only known wild populations of *Newcombia cumingi, Partulina semicarinata,* and *P. variabilis* are imminently threatened by predation by nonnative rats, Jackson's chameleons, and snails (Solem 1990, p. 35; Hadfield 1986, p. 325; Hadfield *et al.* 1993, p. 611; Hadfield 2007, p. 9; Hadfield 2009, p. 11; Hadfield and Saufler 2009, p. 1595; Holland *et al.* 2010, p. 1,437).

• The number of individuals of *Partulina semicarinata* and *P. variabilis* has declined by approximately 50 percent between 1993 and 2005 at known locations (Hadfield 2005, p. 305).

Hybridization

Natural hybridization is a frequent phenomenon in plants and can lead to the formation of new species (Orians 2000, p. 1,949), or sometimes to the decline of species through genetic assimilation or ''introgression'' (Ellstrand 1992, pp. 77, 81; Levin *et al.* 1996, pp. 10–16; Rhymer and Simberloff 1996, p. 85). Hybridization, however, is especially problematic for rare species that come into contact with species that are abundant or more common (Rhymer and Simberloff 1996, p. 83). We consider hybridization to threaten five species in this proposed rule because it may lead to extinction of one or both of the original genotypically distinct species. Hybrids have been reported between *Bidens campylotheca* ssp. *pentamera* and *B. campylotheca* ssp. *waihoiensis,* two subspecies proposed for listing that occur in close proximity on east Maui. On east Maui, the species *Cyanea obtusa* is known from two individuals, but only hybrids between *C. obtusa* and the more abundant *C. elliptica* are known on west Maui. The current status of the species *Peperomia subpetiolata* is unknown because only hybrids between *P. subpetiolata* and *P. cookiana,* and perhaps *P. hertapetiola,* are known from its historically reported locations on east Maui. The species *Schiedea salicaria* hybridizes with the uncommon *S. menziesii* in the west Maui mountains. According to Wagner *et al.* (2005b, p. 138), one or more of the three known occurrences of *S. salicaria* may represent a ''hybrid swarm'' between the two species (hybrids can interbreed among themselves and also with the parent species).

Regeneration

Lack of, or low levels of, regeneration (reproduction and recruitment) in the wild has been observed and is a threat to *Pleomele fernaldii* (Oppenheimer 2010a, in litt.). Although there are currently approximately several hundred to 1,000 individuals, very little recruitment has been observed at the known locations over the past 10 years (Oppenheimer 2008d, in litt.). The reasons for this are not clearly understood.

Human Trampling and Hiking

Human impacts, including trampling by hikers, have been documented as a threat to *Cyanea maritae* and *Wikstroemia villosa* (Oppenheimer 2010o, in litt.; PEPP 2010, p. 51; Welton 2010b, in litt.). Individuals climbing and hiking off established trails could trample individual plants and contribute to soil compaction and erosion, preventing growth and establishment of seedlings (Oppenheimer 2010a, in litt.) because this has been observed with other native species (Wood 2001, in litt.; MLP 2005, p. 23).

Summary of Other Natural or Manmade Factors Affecting Their Continued Existence

We consider the threat from limited number of populations and few (less than 50) individuals to be a serious and ongoing threat to the 20 plant species proposed for listing (*Cyanea grimesiana* ssp. *grimesiana, C. horrida, C. magnicalyx, C. maritae, C. mauiensis, C. munroi, C. obtusa, C. profuga, C. solanacea, Cyrtandra ferripilosa, Festuca molokaiensis, Peperomia subpetiolata, Phyllostegia bracteata, P. haliakalae, P. pilosa, Pittosporum halophilum, Schiedea jacobii, S. laui, Stenogyne kauaulaensis,* and *Wikstroemia villosa*) because (1) these species may experience reduced reproductive vigor due to ineffective pollination or inbreeding depression; (2) they may experience reduced levels of genetic variability, leading to diminished capacity to adapt and respond to environmental changes,

thereby lessening the probability of long-term persistence; and (3) a single catastrophic event may result in extirpation of remaining populations and extinction of the species. This threat applies to the entire range of each species.

The threat to the three tree snails *Newcombia cumingi, Partulina semicarinata,* and *P. variabilis* from limited numbers of populations and individuals is ongoing and is expected to continue into the future because (1) these species may experience reduced reproductive vigor due to inbreeding depression; (2) they may experience reduced levels of genetic variability leading to diminished capacity to adapt and respond to environmental changes, thereby lessening the probability of long-term persistence; (3) a single catastrophic event (e.g., hurricane, drought) may result in extirpation of remaining populations and extinction of these species; and (4) species with few known locations, such as *N. cumingi, P. semicarinata,* and *P. variabilis,* are less resilient to threats that might otherwise have a relatively minor impact on widely distributed species. For example, the reduced availability of host trees or an increase in predation of the tree snail adults that might be absorbed in a widely distributed species could result in a significant decrease in survivorship or reproduction of a species with limited distribution. The limited distribution of these three species thus magnifies the severity of the impact of the other threats discussed in this proposed rule.

The threat to *Bidens campylotheca* ssp. *pentamera, B. campylotheca* ssp. *waihoiensis, Cyanea obtusa, Peperomia subpetiolata,* and *Schiedea salicaria* from hybridization is ongoing and expected to continue into the future because hybrids are reported between these species and other, more abundant species, and no efforts are being implemented in the wild to prevent potential hybridizations. We consider the threat to *Pleomele fernaldii* from lack of regeneration to be ongoing and to continue into the future because the reasons for the lack of recruitment in the wild are unknown and uncontrolled, and any competition from nonnative plants or habitat modification by ungulates or fire, or predation by ungulates or rats, could lead to the extirpation of this species. Ongoing human activities (e.g., trampling and hiking) are a threat to *Cyanea maritae* and *Wikstroemia villosa* and are expected to continue into the future because field biologists have reported trampling of vegetation near populations of *Cyanea maritae* and the two remaining wild individuals of *Wikstroemia villosa,* and the effects of these activities could lead to injury and death of individual plants, potentially resulting in extirpation from the wild.

Proposed Determination for 40 Species

We have carefully assessed the best scientific and commercial information available regarding threats to each of the 40 species proposed or reevaluated for listing. We find that all of these species face threats which are ongoing and expected to continue into the future throughout their ranges from the present destruction and modification of their habitats from nonnative feral ungulates and nonnative plants (Factor A). Thirteen of the plant species (*Bidens campylotheca* ssp. *pentamera, Canavalia pubescens, C. magnicalyx, C. mauiensis, C. obtusa, Festuca molokaiensis, Phyllostegia bracteata, P. haliakalae, Pittosporum halophilum, Pleomele fernaldii, Santalum haleakale* var. *lanaiense, Schiedea salicaria,* and *Stenogyne kauaulaensis*) are threatened by habitat destruction and modification from fire, and 16 plant species (*Bidens campylotheca* ssp. *waihoiensis, Cyanea asplenifolia, C. duvalliorum, C. grimesiana* ssp. *grimesiana, C. horrida, C. magnicalyx, C. maritae, C. mauiensis, C. munroi, C. profuga, C. solanacea, Cyrtandra filipes, Schiedea jacobii, S. laui, Stenogyne kauaulaensis,* and *Wikstroemia villosa*) are threatened by the destruction and modification of their habitats from landslides, rockfalls, treefalls, or flooding. Habitat loss or degradation due to drought threatens *Cyanea horrida, Festuca molokaiensis, Schiedea jacobii,* and *Stenogyne kauaulaensis* as well as the tree snails *Newcombia cumingi, Partulina semicarinata,* and *P. variabilis.* In addition, we are concerned about the effects of projected climate change on all species, particularly rising temperatures, but recognize there is limited information on the exact nature of impacts that these species may experience (Factor A).

Overcollection for commercial and recreational purposes poses a serious potential threat to all three tree snail species (Factor B). Predation and herbivory on all 37 plant species by feral pigs, goats, cattle, axis deer, mouflon, rats, and slugs poses a serious and ongoing threat, as does predation of all three tree snail species (*N. cumingi, P. semicarinata,* and *P. variabilis*) by rats, nonnative snails, and potentially Jackson's chameleon (Factor C). The inadequacy of existing regulatory mechanisms (i.e., inadequate protection of habitat and inadequate protection from the introduction of nonnative species) poses a serious and ongoing threat to all 40 species (Factor D). There are serious and ongoing threats to 20 plant species (*Cyanea grimesiana* ssp. *grimesiana, C. horrida, C. magnicalyx, C. maritae, C. mauiensis, C. munroi, C. obtusa, C. profuga, C. solanacea, Cyrtandra ferripilosa, Festuca molokaiensis, Peperomia subpetiolata, Phyllostegia bracteata, P. haliakalae, P. pilosa, Pittosporum halophilum, Schiedea jacobii, S. laui, Stenogyne kauaulaensis,* and *Wikstroemia villosa*) and the three tree snails due to factors associated with small numbers of populations and individuals; to *Bidens campylotheca* ssp. *pentamera, B. campylotheca* ssp. *waihoiensis, Cyanea obtusa, Peperomia subpetiolata,* and *Schiedea salicaria* from hybridization; to *Pleomele fernaldii* from the lack of regeneration in the wild; and to *Cyanea maritae* and *Wikstroemia villosa* from hiking and trampling (Factor E) (see Table 3). These threats are exacerbated by these species' inherent vulnerability to extinction from stochastic events at any time because of their endemism, small numbers of individuals and populations, and restricted habitats.

The Act defines an endangered species as any species that is ''in danger of extinction throughout all or a significant portion of its range'' and a threatened species as any species ''that is likely to become endangered throughout all or a significant portion of its range within the foreseeable future.'' We find that each of these endemic species is presently in danger of extinction throughout its entire range, based on the immediacy, severity, and scope of the threats described above. Therefore, on the basis of the best available scientific and commercial information, we propose to list, or in the case of *Cyanea grimesiana* ssp. *grimesiana* and *Santalum haleakalae* var. *lanaiense* to retain the listing of, the following 40 species as endangered in accordance with section 3(6) of the Act: the plants *Bidens campylotheca* ssp. *pentamera, Bidens campylotheca* ssp. *waihoiensis, Bidens conjuncta, Calamagrostis hillebrandii, Canavalia pubescens, Cyanea asplenifolia, Cyanea duvalliorum, Cyanea grimesiana* ssp. *grimesiana, Cyanea horrida, Cyanea kunthiana, Cyanea magnicalyx, Cyanea maritae, Cyanea mauiensis, Cyanea munroi, Cyanea obtusa, Cyanea profuga, Cyanea solanacea, Cyrtandra ferripilosa, Cyrtandra filipes, Cyrtandra oxybapha, Festuca molokaiensis, Geranium hanaense, Geranium hillebrandii, Mucuna sloanei* var. *persericea, Myrsine vaccinioides, Peperomia subpetiolata, Phyllostegia*

bracteata, Phyllostegia haliakalae, Phyllostegia pilosa, Pittosporum halophilum, Pleomele fernaldii, Santalum haleakalae var. *lanaiense, Schiedea jacobii, Schiedea laui, Schiedea salicaria, Stenogyne kauaulaensis,* and *Wikstroemia villosa;* and the tree snails *Newcombia cumingi, Partulina semicarinata,* and *Partulina variabilis.*

Under the Act and our implementing regulations, a species may warrant listing if it is endangered or threatened throughout all or a significant portion of its range. Each of the 40 Maui Nui species proposed or reevaluated for listing in this rule is highly restricted in its range, and the threats occur throughout its range. Therefore, we assessed the status of each species throughout its entire range. In each case, the threats to the survival of these species occur throughout the species' range and are not restricted to any particular portion of that range. Accordingly, our assessment and proposed determination applies to each species throughout its entire range.

Available Conservation Measures

Conservation measures provided to species listed as endangered or threatened under the Act include recognition, recovery actions, requirements for Federal protection, and prohibitions against certain activities. Recognition through listing results in public awareness and conservation by Federal, State, and local agencies, private organizations, and individuals. The Act encourages cooperation with the States and requires that recovery actions be carried out for all listed species. The protection measures required of Federal agencies and the prohibitions against certain activities involving listed animals and plants are discussed, in part, below.

The primary purpose of the Act is the conservation of endangered and threatened species and the ecosystems upon which they depend. The ultimate goal of such conservation efforts is the recovery of these listed species, so that they no longer need the protective measures of the Act. Subsection 4(f) of the Act requires the Service to develop and implement recovery plans for the conservation of endangered and threatened species. The recovery planning process involves the identification of actions that are necessary to halt or reverse the species' decline by addressing the threats to its survival and recovery. The goal of this process is to restore listed species to a point where they are secure, self-sustaining, and functioning components of their ecosystems.

Recovery planning includes the development of a recovery outline shortly after a species is listed, preparation of a draft and final recovery plan, and revisions to the plan as significant new information becomes available. The recovery outline guides the immediate implementation of urgent recovery actions and describes the process to be used to develop a recovery plan. The recovery plan identifies site-specific management actions that will achieve recovery of the species, measurable criteria that help to determine when a species may be downlisted or delisted, and methods for monitoring recovery progress. Recovery plans also establish a framework for agencies to coordinate their recovery efforts and provide estimates of the cost of implementing recovery tasks. Recovery teams (comprised of species experts, Federal and State agencies, non-government organizations, and stakeholders) are often established to develop recovery plans. When completed, the recovery outlines, draft recovery plans, and the final recovery plans will be available from our Web site (*http://www.fws.gov/endangered*), or from our Pacific Islands Fish and Wildlife Office (see **FOR FURTHER INFORMATION CONTACT**).

Implementation of recovery actions generally requires the participation of a broad range of partners, including other Federal agencies, States, non-governmental organizations, businesses, and private landowners. Examples of recovery actions include habitat restoration (e.g., restoration of native vegetation), research, captive propagation and reintroduction, and outreach and education. The recovery of many listed species cannot be accomplished solely on Federal lands because their range may occur primarily or solely on non-Federal lands. To achieve recovery of these species requires cooperative conservation efforts on private and State lands.

If these species are listed, funding for recovery actions will be available from a variety of sources, including Federal budgets, State programs, and cost share grants for non-Federal landowners, the academic community, and non-governmental organizations. In addition, under section 6 of the Act, the State of Hawaii would be eligible for Federal funds to implement management actions that promote the protection and recovery of the 40 species. Information on our grant programs that are available to aid species recovery can be found at: *http://www.fws.gov/grants.*

Although these species are only proposed for listing under the Act at this time, please let us know if you are interested in participating in recovery efforts for these species. Additionally, we invite you to submit any new information on these species whenever it becomes available and any information you may have for recovery planning purposes (see **FOR FURTHER INFORMATION CONTACT**).

Section 7(a) of the Act, as amended, requires Federal agencies to evaluate their actions with respect to any species that is proposed or listed as endangered or threatened with respect to its critical habitat, if any is designated. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR part 402. Section 7(a)(1) of the Act mandates that all Federal agencies shall utilize their authorities in furtherance of the purposes of the Act by carrying out programs for the conservation of endangered and threatened species listed under section 4 of the Act. Section 7(a)(2) of the Act requires Federal agencies to ensure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of a listed species or result in destruction or adverse modification of critical habitat. If a Federal action may affect the continued existence of a listed species or its critical habitat, the responsible Federal agency must enter into consultation with the Service.

For the 40 plants and animals proposed or reevaluated for listing as endangered species in this rule, Federal agency actions that may require consultation as described in the preceding paragraph include, but are not limited to, actions within the jurisdiction of the Natural Resources Conservation Service (NRCS), the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service, and branches of the Department of Defense (DOD). Examples of these types of actions include activities funded or authorized under the Farm Bill Program, Environmental Quality Incentives Program, Ground and Surface Water Conservation Program, Clean Water Act (33 U.S.C. 1251 *et seq.*), Partners for Fish and Wildlife Program, and DOD construction activities related to training or other military missions.

The Act and its implementing regulations set forth a series of general prohibitions and exceptions that apply to all endangered wildlife and plants. The prohibitions, codified at 50 CFR 17.21 and 17.61, apply. These prohibitions, in part, make it illegal for any person subject to the jurisdiction of the United States to take (includes harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect; or to attempt any of these), import, export,

ship in interstate commerce in the course of commercial activity, or sell or offer for sale in interstate or foreign commerce any listed wildlife species. It is also illegal to possess, sell, deliver, carry, transport, or ship any such wildlife that has been taken illegally. In addition, for plants listed as endangered, the Act prohibits the malicious damage or destruction on areas under Federal jurisdiction and the removal, cutting, digging up, or damaging or destroying of such plants in knowing violation of any State law or regulation, including State criminal trespass law. Certain exceptions to the prohibitions apply to agents of the Service and State conservation agencies.

We may issue permits to carry out otherwise prohibited activities involving endangered or threatened wildlife and plant species under certain circumstances. Regulations governing permits are codified at 50 CFR 17.22 and 17.62 for endangered species. With regard to endangered wildlife, a permit must be issued for the following purposes: for scientific purposes, to enhance the propagation and survival of the species, and for incidental take in connection with otherwise lawful activities. Requests for copies of the regulations regarding listed species and inquiries about prohibitions and permits may be addressed to U.S. Fish and Wildlife Service, Pacific Region, Ecological Services, Eastside Federal Complex, 911 NE. 11th Avenue, Portland, OR 97232–4181 (telephone 503–231–6131; facsimile 503–231–6243).

It is our policy, as published in the **Federal Register** on July 1, 1994 (59 FR 34272), to identify to the maximum extent practicable at the time a species is listed, those activities that would or would not constitute a violation of section 9 of the Act. The intent of this policy is to increase public awareness of the effect of a proposed listing on proposed and ongoing activities within the range of species proposed for listing. The following activities could potentially result in a violation of section 9 of the Act; this list is not comprehensive:

(1) Unauthorized collecting, handling, possessing, selling, delivering, carrying, or transporting of the species, including import or export across State lines and international boundaries, except for properly documented antique specimens of these taxa at least 100 years old, as defined by section 10(h)(1) of the Act;

(2) Introduction of nonnative species that compete with or prey upon the 40 species proposed or reevaluated for listing, such as the introduction of competing, nonnative plants or animals to the State of Hawaii; and

(3) The unauthorized release of biological control agents that attack any life stage of these 40 species.

Questions regarding whether specific activities would constitute a violation of section 9 of the Act should be directed to the Pacific Islands Fish and Wildlife Office (see **FOR FURTHER INFORMATION CONTACT**). Requests for copies of the regulations concerning listed animals and general inquiries regarding prohibitions and permits may be addressed to the U.S. Fish and Wildlife Service, Pacific Region, Ecological Services, Endangered Species Permits, Eastside Federal Complex, 911 NE. 11th Avenue, Portland, OR 97232–4181 (telephone 503–231–6131; facsimile 503–231–6243).

Federal listing of the 38 species proposed for listing in this rule (we are not including the 2 already listed species that are being reevaluted for listing) would automatically invoke State listing under Hawaii's Endangered Species law (H.R.S. 195D 1–32) and supplement the protection available under other State laws. These protections prohibit take of these species and encourage conservation by State government agencies. Further, the State may enter into agreements with Federal agencies to administer and manage any area required for the conservation, management, enhancement, or protection of endangered species (H.R.S. 195D–5). Funds for these activities could be made available under section 6 of the Act (Cooperation with the States). Thus, the Federal protection afforded to these species by listing them as endangered species would be reinforced and supplemented by protection under State law.

Critical Habitat

Background

Critical habitat is defined in section 3 of the Act as:

(i) The specific areas within the geographical 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) Which may require special management considerations or protection; and

(ii) Specific areas outside the geographical 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 under section 3 of the Act, means the use of all methods and procedures that are necessary to bring an endangered or threatened species to the point at which the measures provided under the Act are no longer necessary. Such methods and procedures include, but are not limited to, all activities associated with scientific resources management, such as research, census, law enforcement, habitat acquisition and maintenance, propagation, live trapping, transplantation, and, in the extraordinary case where population pressures within a given ecosystem cannot otherwise be relieved, may include regulated taking.

Critical habitat receives protection under section 7 of the Act through the prohibition against Federal agencies carrying out, funding, or authorizing the destruction or adverse modification of critical habitat. Section 7(a)(2) of the Act requires consultation on Federal actions that may affect critical habitat. The designation of critical habitat does not affect land ownership or establish a refuge, wilderness, reserve, preserve, or other conservation area. Such designation does not allow the government or public access to private lands. Such designation does not require implementation of restoration, recovery, or enhancement measures by the landowner. Where a landowner seeks or requests Federal agency funding or authorization that may affect a listed species or critical habitat, the consultation requirements of section 7(a)(2) of the Act would apply, but in the event of a destruction or adverse modification finding, the Federal action agency's and the applicant's obligation is not to restore or recover the species, but to implement reasonable and prudent alternatives to avoid destruction or adverse modification of critical habitat.

For inclusion in a critical habitat designation, the habitat within the geographical area occupied by the species at the time of listing must contain the physical or biological features essential to the conservation of the species, and be included only if those features may require special management considerations or protection. 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. Under the Act and regulations at 50 CFR 424.12(e), we can designate critical habitat in areas outside the geographical area occupied by the species at the time it is listed only when we determine that those areas are essential for the

conservation of the species and that designation limited to those areas occupied at the time of listing would be inadequate to ensure the conservation of the species.

Section 4 of the Act requires that we designate critical habitat on the basis of the best scientific and commercial data available. Further, our Policy on Information Standards Under the Endangered Species Act (published in the **Federal Register** on July 1, 1994 (59 FR 34271)), the Information Quality Act (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001 (Pub. L. 106–554; H.R. 5658)), and our associated Information Quality Guidelines, provide criteria, establish procedures, and provide guidance to ensure that our decisions are based on the best scientific data available. They require our biologists, to the extent consistent with the Act and with the use of the best scientific data available, to use primary and original sources of information as the basis for recommendations to designate critical habitat.

When we are determining which areas should be proposed as critical habitat, our primary source of information is generally the information developed during the listing process for the species. Additional information sources may include the recovery plan for the species; articles in peer-reviewed journals; conservation plans developed by States and counties; scientific status surveys and studies; biological assessments; or other unpublished materials and expert opinion or personal knowledge.

Habitat is often dynamic, and species may move from one area to another over time. Furthermore, we recognize that critical habitat designated at a particular point in time may not include all of the habitat areas that we may later determine to be necessary for the recovery of the species, as additional scientific information may become available in the future. For these reasons, a critical habitat designation does not signal that habitat outside the designated area is unimportant or may not be required for recovery of the species.

The information currently available on the effects of global climate change and increasing temperatures does not make sufficiently precise estimates of the location and magnitude of the effects to allow us to incorporate this information into our current designation of critical habitat, nor are we currently aware of any climage change information specific to the habitat of any of the species being addressed in this proposed rule that would indicate what areas may become important to the species in the future. Therefore, we are unable to determine what additional areas, if any, may be appropriate to include in the proposed critical habitat for these species; however, we specifically request information from the public on the currently predicted effects of climate change on the species addressed in this proposed rule and their habitat. Furthermore, we recognize that designation of critical habitat may not include all of the habitat areas we may eventually determine are necessary for the recovery of the species, based on scientific data now available to the Service. For these reasons, a critical habitat designation does not signify that habitat outside of the designated area is unimportant or may not be required for the recovery of the species.

Areas that are important to the conservation of the species, but are outside the critical habitat designation, will continue to be subject to conservation actions we implement under section 7(a)(1) of the Act. Areas that support populations are also subject to the regulatory protections afforded by the section 7(a)(2) jeopardy standard, as determined on the basis of the best available scientific information at the time of the agency action. Federally funded or permitted projects affecting listed species outside their designated critical habitat areas may require consultation under section 7 of the Act and may still result in jeopardy findings in some cases. Similarly, critical habitat designations made on the basis of the best available information at the time of designation will not control the direction and substance of future recovery plans, habitat conservation plans (HCPs), section 7 consultations, or other species conservation planning efforts if any new information available to these planning efforts calls for a different outcome.

Prudency Determination for 44 Maui Nui Species

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

Species Proposed or Reevaluated for Listing

As we have discussed under the threats analysis for Factor B, above, there is currently no documentation that the 37 plants proposed or reevaluated for listing are threatened by taking or other human activity. Overcollection is a potential serious threat to the three tree snails proposed for listing (*Newcombia cumingi, Partulina semicarinata,* and *P. variabilis*) (see *Overcollection for Commercial, Recreational, Scientific or Educational Purposes,* above). Europeans and others collected Hawaiian tree snails starting in the 1800s and into the early 20th century. Even today, there are Internet Web sites that sell Hawaiian tree snail shells, including other species of the Hawaiian *Partulina.* It is unknown if the shells offered for sale are from historical collections or recent collections from the wild. However, we do not believe our proposed critical habitat will increase the threat of overcollection of *N. cumingi, P. semicarinata,* and *P. variabilis* because our approach to critical habitat designation is based on the physical or biological features shared by multiple species within an ecosystem and does not identify the locations of individuals of the three tree snails within the shared ecosystem. In addition, the proposed critical habitat unit maps are published at a scale that does not pinpoint the locations of the three snail species to the extent that individuals of these three tree snail species can be located on the private lands on which they occur.

Listed Species

We listed the akohekohe or crested honeycreeper and the kiwikiu or Maui parrotbill as endangered species in 1967 (32 FR 4001, March 11, 1967), under the Endangered Species Preservation Act of 1966 (precursor to the Endangered Species Act of 1973). Critical habitat was not determined at that time because it was not required under the Act until 1978. Neither the akohekohe nor the kiwikiu are threatened by taking or other human activity (32 FR 4001, March 11, 1967; USFWS 2006, pp. 2–81 to 2–82, 2–142).

At the time we listed the plant *Kokia cookei* (Cooke's kokia) as endangered, we found that designation of critical habitat was not prudent because this species had been extirpated from its natural range on Molokai and was known only from a single specimen in cultivation and tissue culture maintained in a laboratory (44 FR

62470; October 30, 1979). *Kokia cookei* is not threatened by vandalism, collecting, or other human activities, and we believe there is a benefit to a critical habitat designation for this species (see discussion below).

We listed the plant *Acaena exigua* (liliwai), known from Kauai and Maui, as endangered in 1992 (57 FR 20772; May 15, 1992). At that time, the species had not been seen since 1973. In 1997, botanists rediscovered *A. exigua* in the Puu Kukui Preserve on west Maui, but it has not been seen at this location since 2000 (68 FR 25934; May 14, 2003). We determined that critical habitat was not prudent for *Acaena exigua* at the time of listing (1992) and again at the time we reevaluated prudency determinations for 95 listed plants on Kauai (2003) (57 FR 20772, May 15, 1992; 68 FR 9116, February 27, 2003). *Acaena exigua* is not threatened by vandalism, collecting, or other human activities, and we believe there is a benefit to a critical habitat designation for this species (see discussion below). Although the reasons for the disappearance of this species on west Maui are not known, botanists believe it may be rediscovered in the same area where it was last seen in 2000, with sustained searching.

We reviewed the information available for the 37 plants and three tree snails proposed or reevaluated for listing; the two endangered birds, akohekohe and kiwikiu; and the endangered plants *Kokia cookei* and *Acaena exigua,* pertaining to the biological needs of these 44 species and characteristics of their last known habitats. In the absence of finding that the designation of critical habitat would increase threats to a species, if there are any benefits to a critical habitat designation, then a prudent finding is warranted. The potential benefits to the 40 proposed or reevaluated species; the two endangered birds, akohekohe and kiwikiu; and the endangered plants *K. cookei* and *A. exigua* include: (1) Triggering consultation under section 7 of the Act, in new areas for actions in which there may be a Federal nexus 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 features and areas; (3) providing educational benefits to State or county governments or private entities; and (4) preventing people from causing inadvertent harm to the species. Recovery of both *K. cookei* and *A. exigua,* neither of which currently occurs in the wild, will include *in-situ* conservation and protection of wild individuals, enhancement of existing populations with outplantings, and establishment of new populations through outplanting of propagated individuals into potentially suitable habitat within their historical ranges (USFWS 1997, p. 11; USFWS 1998a, pp. 22–23; Orr 2007, in litt., p. 8; Seidman 2007, in litt.).

The primary regulatory effect of critical habitat is the section 7(a)(2) requirement that Federal agencies refrain from taking any action that destroys or adversely modifies critical habitat. We find that the designation of critical habitat for each of the 40 species proposed or reevaluated for listing in this rule; the endangered birds the akohekohe and kiwikiu; and the endangered plants *Kokia cookei* and *Acaena exigua* will benefit them by serving to focus conservation efforts on the restoration and maintenance of ecosystem functions that are essential for attaining their recovery and long-term viability. In addition, the designation of critical habitat serves to inform management and conservation decisions by identifying any additional physical or biological features of the ecosystem that may be essential for the conservation of certain species, such as the availability of bogs for *Calamagrostis hillebrandii, Geranium hanaense,* and *G. hillebrandii.* Therefore, as we have determined that the designation of critical habitat will not likely increase the degree of threat to the species and may provide some measure of benefit, we find that designation of critical habitat is prudent for the following 44 species, as critical habitat would be beneficial and there is no evidence that the designation of critical habitat would result in an increased threat from taking or other human activity for these species:

(1) Plants—*Acaena exigua, Bidens campylotheca* ssp. *pentamera, Bidens campylotheca* ssp. *waihoiensis, Bidens conjuncta, Calamagrostis hillebrandii, Canavalia pubescens, Cyanea asplenifolia, Cyanea duvalliorum, Cyanea grimesiana* ssp. *grimesiana, Cyanea horrida, Cyanea kunthiana, Cyanea magnicalyx, Cyanea maritae, Cyanea mauiensis, Cyanea munroi, Cyanea obtusa, Cyanea profuga, Cyanea solanacea, Cyrtandra ferripilosa, Cyrtandra filipes, Cyrtandra oxybapha, Festuca molokaiensis, Geranium hanaense, Geranium hillebrandii, Kokia cookei, Mucuna sloanei* var. *persericea, Myrsine vaccinioides, Peperomia subpetiolata, Phyllostegia bracteata, Phyllostegia haliakalae, Phyllostegia pilosa, Pittosporum halophilum, Pleomele fernaldii, Santalum haleakalae* var. *lanaiense, Schiedea jacobii, Schiedea laui, Schiedea salicaria, Stenogyne kauaulaensis,* and *Wikstroemia villosa;*

(2) Animals—birds: akohekhoe and kiwikiu; snails: *Newcombia cumingi, Partulina semicarinata,* and *Partulina variabilis.*

Critical Habitat Determinability for the Species Cyanea mauiensis, *Proposed for Listing, and for the Listed Species* Phyllostegia hispida

As stated above, section 4(a)(3) of the Act requires the designation of critical habitat concurrently with the species' listing ''to the maximum extent prudent and determinable.'' Our regulations at 50 CFR 424.12(a)(2) state that critical habitat is not determinable when one or both of the following situations exist:

(i) Information sufficient to perform required analyses of the impacts of the designation is lacking, or

(ii) The biological needs of the species are not sufficiently well known to permit identification of an area as critical habitat.

When critical habitat is not determinable, the Act provides for an additional year to publish a critical habitat designation (16 U.S.C. 1533(b)(6)(C)(ii)).

In accordance with section 3(5)(A)(i) of the Act and regulations at 50 CFR 424.12, in determining which areas occupied by the species at the time of listing to designate as critical habitat, we consider those physical and biological features essential to the conservation of the species that may require special management considerations or protection. The primary constituent elements of critical habitat include, but are not limited to:

(1) Space for individual and population growth, and for normal behavior;

(2) Food, water, air, light, minerals, or other nutritional or physiological requirements;

(3) Cover or shelter;

(4) Sites for breeding, reproduction, rearing (or development) of offspring; and

(5) Habitats that are protected from disturbance or are representative of the historical geographical and ecological distributions of a species.

We are currently unable to identify the physical and biological features that are considered essential to the conservation of the plant *Cyanea mauiensis,* which is proposed for listing, on Maui because necessary information to understanding the life-history needs of the species is not available at this time. Key features of the life history of this plant species, such as flowering cycles, pollination vectors, specific environmental requirements,

and limiting factors, remain unknown. Nothing is known of the preferred habitat of, or native species associated with, this species on the island of Maui. *Cyanea mauiensis* was last observed on Maui over 100 years ago, and its habitat has been modified and altered by nonnative ungulates and plants, fire, and stochastic events (e.g., hurricanes, landslides). In addition, predation by nonnative rats, and herbivory by nonnative ungulates and invertebrates, likely led to the extirpation of this species from Maui. Because a century has elapsed since *C. mauiensis* was last observed, the optimal conditions that provide the biological or ecological requisites of this species are not known. As described above, we can surmise that habitat degradation from a variety of factors and predation by a number of nonnative species has contributed to the decline of this species on Maui; however, we do not know the physical or biological features that are essential for *C. mauiensis.* As we are unable to identify the physical and biological features essential to the conservation of this species, we are unable to identify areas on Maui that contain these features.

Although we have determined that the designation of critical habitat is prudent for the plant *Cyanea mauiensis,* the biological needs of this species are not sufficiently well known to permit identification of the physical or biological features that may be essential for the conservation of the species, or those areas that provide the physical or biological features essential to the conservation of the species. Therefore, we find that critical habitat for *C. mauiensis* is not determinable at this time. We intend to continue gathering information regarding the essential life-history requirements of this plant species to facilitate the identification of those physical or biological features that are essential to the conservation of *C. mauiensis.*

We listed the plant *Phyllostegia hispida* (NCN), known only from the island of Molokai, as an endangered species on March 17, 2009 (74 FR 11319). At the time of listing, we determined that critical habitat was prudent but not determinable for this species, but acknowledged that for the future designation of critical habitat we would evaluate the needs of *P. hispida* within the ecological context of the broader ecosystem in which it occurs. We are now proposing critical habitat for *P. hispida,* based on the identification of the physical and biological features that contribute to the successful functioning of the ecosystem upon which it depends.

Proposed Critical Habitat Designation for 50 Species and Proposed Revision of Critical Habitat Designation for 85 Species On Molokai, Lanai, Maui, and Kahoolawe

In this section, we discuss the proposed designation of critical habitat for 50 species (39 of the 40 species discussed above in our listing proposal and reevaluation, for which we concluded that critical habitat was both prudent and determinable; 2 listed bird species (akohekohe or crested honeycreeper and kiwikiu or Maui parrotbill); and 9 listed plants *Abutilon eremitopetalum, Acaena exigua, Cyanea gibsonii, Kadua cordata* ssp. *remyi, Kokia cookei, Labordia tinifolia* var. *lanaiensis, Melicope munroi, Phyllostegia hispida,* and *Viola lanaiensis*). This section also discusses the currently designated critical habitat for 85 species of plants on the islands of Molokai, Lanai, Maui, and Kahoolawe, based on new information. This information represents the best current scientific and commercial information available.

Revision of Critical Habitat for 85 Plants on Molokai, Lanai, Maui, and Kahoolawe

Under section 4(a)(3)(A)(ii) of the Act we may, as appropriate, revise a critical habitat designation. In 1984, we designated critical habitat for a single species of plant, *Gouania hillebrandii,* on 114 ac (46 ha) in 4 units (49 FR 44753) based on its known location at the time. In 2003, we designated critical habitat for 3 Lanai plants on 789 ac (320 ha) in 6 units (68 FR 1220, January 9, 2003); for 41 Molokai plants on 24,333 ac (9,843 ha) in 88 units (68 FR 12982, March 18, 2003); and for 60 plants on Maui and Kahoolawe on 93,200 ac (37,717 ha) in 139 units (68 FR 25934, May 14, 2003). All designations were based on the known locations of the species at the time. Based on new scientific data available since 2003, we are proposing to revise critical habitat for 85 plant species on the islands of Molokai, Lanai, Maui, and Kahoolawe (this number differs from the original number of species with critical habitat designations, due to some taxonomic revisions made subsequent to the original designations). Approximately 47 percent of the area we are proposing as critical habitat in this rule overlaps with the areas designated in the 1984 and 2003 final critical habitat rules. In some areas, the footprint of the proposed revision is larger than the 1984 and 2003 designations, to accommodate the expansion of species' ranges within the particular ecosystem in which they occur (e.g., expansion into currently unoccupied habitat). The proposed revision correlates each species' physical or biological requirements with the characteristics of the ecosystems on which they depend (e.g., elevation, rainfall, species associations, etc.), and also includes areas unoccupied by the species but determined to be essential for the conservation of the species. The proposed revision would enable managers to focus conservation management efforts on common threats that occur across shared ecosystems and facilitate the restoration of the ecosystem function and species-specific habitat needs for the recovery of each of the 85 species. An added benefit includes the publication of more comprehensive critical habitat unit maps that should be more useful to the public and conservation managers.

Background for 94 Listed Maui Nui Plants

It is our intent to discuss only those topics directly relevant to the proposed designation of new and revised critical habitat on the islands of Molokai, Lanai, Maui, and Kahoolawe. For additional information on the 85 plant species with currently designated critical habitat, refer to the final critical habitat rules for *Gouania hillebrandii,* and the Lanai, Molokai, and Maui and Kahoolawe plants published in the **Federal Register** on November 9, 1984 (49 FR 44753), January 9, 2003 (68 FR 1220), March 18, 2003 (68 FR 12982), and May 14, 2003 (68 FR 25934). For additional information on the 9 plant species listed as endangered but that do not yet have designated critical habitat, please refer to the listing rules for those species published in the **Federal Register** as follows: *Abutilon eremitopetalum* (56 FR 47686, September 20, 1991), *Acaena exigua* (57 FR 20772, May 15, 1992), *Cyanea gibsonii* (originally listed as *Cyanea macrostegia* ssp. *gibsonii* (56 FR 47686, September 20, 1991)), *Kadua cordata* ssp. *remyi* (originally listed as *Hedyotis schlechtendahliana* var. *remyi* (64 FR 48307, September 3, 1999)), *Kokia cookei* (44 FR 62470, October 30, 1979), *Labordia tinifolia* var. *lanaiensis* (64 FR 48307, September 3, 1999), *Melicope munroi* (64 FR 48307, September 3, 1999), *Phyllostegia hispida* (74 FR 11319, March 17, 2009), and *Viola lanaiensis* (56 FR 47686, September 20, 1991). Information on the current status of the two bird species that are listed as endangered but do not yet have designated critical habitat, the akohekohe and kiwikiu, is presented following the information on the current status of 94 listed Maui Nui plants (85

listed plant species for which we are proposing a revision of the current critical habitat designation, and 9 listed plant species without extant critical habitat for which critical habitat is now proposed).

Current Status of 94 Listed Maui Nui Plants

Abutilon eremitopetalum (no common name (NCN)), a shrub in the mallow family (Malvaceae), is endemic to Lanai (Bates 1999, pp. 871–872). At the time we designated critical habitat in 2003, *A. eremitopetalum* was known from a single occurrence of seven individuals on Lanai (68 FR 1220, January 9, 2003). Currently, there are 23 individuals in 1 occurrence at Kahea Gulch in the lowland dry ecosystem (TNC 2007; HBMP 2008; PEPP 2008, p. 45).

Acaena exigua (liliwai), a perennial herb in the rose family (Rosaceae), is known from west Maui and Kauai (Wagner *et al.* 1999p, pp. 1,102–1,103). *Acaena exigua* was rediscovered in 1997 at Puu Kukui on west Maui, when one individual was found growing in a bog in the montane wet ecosystem, but this individual died in 2000 (TNC 2007; Oppenheimer *et al.* 2002, p. 1). This area on west Maui was searched as recently as 2008 by Ken Wood and Sam Aruch; however, no plants were found (Aruch 2010, in litt.). Botanists continue to survey the potentially suitable habitat in the area where this species was last observed.

Adenophorus periens (pendant kihi fern), a fern in the Grammitis family (Grammitidaceae), is epiphytic on the native tree *Acacia koa. Adenophorus periens* is known from Kauai, Oahu, Lanai, Maui, and the island of Hawaii (Palmer 2003, p. 39). At the time we designated critical habitat in 2003, *A. periens* was known from Kauai, Molokai, Oahu, and the island of Hawaii (68 FR 9116, February 27, 2003; 68 FR 12982, March 18, 2003; 68 FR 35950, June 17, 2003; 68 FR 39624, July 2, 2003). *Adenophorus periens* was last seen on Molokai in 1995, in the montane wet ecosystem, at the edge of Pepeopae bog (Perlman 2008b, in litt.). It was last collected in the late 1800s to early 1900s from the montane wet ecosystem on east Maui and Lanai (TNC 2007; HBMP 2008).

Alectryon macrococcus (mahoe), a tree in the soapberry family (Sapindaceae), is known from two varieties: *Alectryon macrococcus* var. *auwahiensis* (east Maui) and *A. macrococcus* var. *macrococcus* (Kauai, Oahu, Molokai, and Maui) (Wagner *et al.* 1999x, p. 1,225). At the time we designated critical habitat in 2003, *A. macrococcus* var. *auwahiensis* was known from three occurrences on east Maui (68 FR 25934, May 14, 2003). Currently, *A. macrococcus* var. *auwahiensis* is found in one occurrence of seven individuals in Auwahi, in the lowland dry ecosystem (TNC 2007; HBMP 2008; NTBG Provenance Report 1993; PEPP 2009, p. 33). This variety was historically found in the lowland dry, montane dry, and montane mesic ecosystems (TNC 2007; HBMP 2008). At the time we designated critical habitat in 2003, *A. macrococcus* var. *macrococcus* was found on Kauai, Molokai, west Maui, and Oahu (68 FR 9116, February 27, 2003; 68 FR 12982, March 18, 2003; 68 FR 25934, May 14, 2003; 68 FR 35950, June 17, 2003). Currently, on Molokai, this variety is found in three known occurrences: one individual at Kahawai, eight individuals from Kaunakakai to Kawela, and one individual in Makolelau, in the lowland mesic and montane mesic ecosystems. On west Maui, *A. macrococcus* var. *macrococcus* is found in 6 occurrences totaling 11 individuals (1 individual each at Honokowai Stream, Wahikuli, Kahoma Ditch Trail, Olowalu, and Iao Valley, and 6 individuals at Honokowai) in the lowland wet and wet cliff ecosystems. On east Maui, there are an unknown number of individuals at Kahakapao in the montane mesic ecosystem (TNC 2007; HBMP 2008; Oppenheimer 2010p, in litt.).

Argyroxiphium sandwicense ssp. *macrocephalum* (ahinahina (= Haleakala silversword)), a perennial rosette shrub in the sunflower family (Asteraceae), is known from the alpine cinder deserts on east Maui (Carr 1999a, p. 261). At the time we designated critical habitat in 2003, there were 7 known occurrences totaling between 39,000 and 44,000 individuals (68 FR 25934, May 14, 2003). Currently, *A. sandwicense* ssp. *macrocephalum* is found in 7 occurrences totaling approximately 50,000 individuals, in the alpine and subalpine ecosystems at the summit and crater of Haleakala (TNC 2007; Perlman 2008c, in litt., p. 1; USFWS 2010). One individual is found in Hanawi Natural Area Reserve in the montane mesic ecosystem (TNC 2007; HBMP 2008; Perlman 2008c, p. 1).

Asplenium dielerectum (asplenium-leaved diellia) (currently listed as *Diellia erecta,* but for which we are proposing a taxonomic change to *Asplenium dielerectum*), a perennial fern in the spleenwort family (Aspleniaceae), is historically known from Kauai, Oahu, Molokai, Lanai, Maui, and the island of Hawaii (Palmer 2003, pp. 117–119). At the time we designated critical habitat in 2003, this species was known from Kauai, Molokai, Maui, Oahu, and the island of Hawaii (68 FR 9116, February 27, 2003; 68 FR 12982, March 18, 2003; 68 FR 25934, May 14, 2003; 68 FR 35950, June 17, 2003; 68 FR 39624, July 2, 2003). Currently, *A. dielerectum* is known from an unknown number of individuals in two occurrences on Molokai and two occurrences totaling five individuals on Maui. On Molokai, an unknown number of plants were last seen in Onini and Makolelau gulches in the 1990s, in the lowland mesic ecosystem (Lau 2010, in litt.). Historically, this species was also found in the montane mesic and lowland wet ecosystems (HBMP 2008). Botanists believe that additional individuals of this species may be found during further searches of potentially suitable habitat on Molokai (Lau 2010, in litt.). Four individuals occur on west Maui at Hanaulaiki in the lowland dry ecosystem, and on east Maui, one individual occurs at Polipoli in the montane mesic ecosystem (Oppenheimer 2010q, in litt.). Historically, *A. dielerectum* was also found in the lowland mesic and lowland wet ecosystems on west Maui, and in the lowland dry and dry cliff ecosystems on Lanai (HBMP 2008).

Asplenium peruvianum var. *insulare* (NCN), which is currently listed as *Asplenium fragile* var. *insulare,* but for which we are proposing a taxonomic revision to *splenium peruviamun* var. *insulare* in this document, is a terrestrial fern in the spleenwort (Aspleniaceae) family, from Maui and the island of Hawaii (Palmer 2003, pp. 70–71). At the time we designated critical habitat in 2003, this variety was found on east Maui in 2 occurrences and on the island of Hawaii in 36 occurrences (68 FR 25934, May 14, 2003; 68 FR 39624, July 2, 2003). Currently, on east Maui, *A. peruvianum* var. *insulare* is known from 5 occurences at Waikamoi Stream, at Puu Luau, east of Hosmer Grove, north of Kalapawili Ridge, and in Hanawi Natural Area Reserve. These occurrences total as many as 100 individuals, in the montane wet, montane mesic, and subalpine ecosystems (TNC 2007; HBMP 2008; Oppenheimer 2010r, in litt.).

Bidens micrantha ssp. *kalealaha* (kookoolau), a perennial herb in the sunflower family (Asteraceae), is known from Lanai and Maui (Ganders and Nagata 1999, pp. 278–279). At the time we designated critical habitat in 2003, this subspecies was known from one occurrence on Lanai and four occurrences on east Maui (68 FR 1220, January 9, 2003; 68 FR 25934, May 14, 2003). Currently, *B. micrantha* ssp. *kalealaha* is known from 4 occurrences

totaling over 200 individuals on Lanai and Maui. On Lanai, this subspecies is known from 1 occurrence of 12 to 14 individuals north of Waiapaa Gulch in the lowland mesic ecosystem (TNC 2007; HBMP 2008; Puttock 2003, p. 1). On east Maui, there are 2 occurrences: approximately 200 individuals south of Puu Keokea, and a few individuals above Polipoli State Park. Both occurrences are in the subalpine ecosystem (TNC 2007; Oppenheimer 2010s, in litt.). On west Maui, there are four to six individuals at Honokowai in the lowland wet ecosystem (TNC 2007; HBMP 2008). This subspecies was historically known from the lowland dry and dry cliff ecosystems on Lanai, and from the montane mesic and lowland dry ecosystems on east Maui (TNC 2007; HBMP 2008).

Bidens wiebkei (kookoolau), a perennial herb in the sunflower family (Asteraceae), is endemic to Molokai (Ganders and Nagata 1999, pp. 282–283). At the time we designated critical habitat in 2003, this species was known from five occurrences on Molokai (68 FR 12982, March 18, 2003). Currently, *B. wiebkei* is known from 6 occurrences totaling as many as 500 individuals. In the coastal ecosystem, several hundred plants occur on the windward sea cliffs from Papalaua Valley to Puahaunui Point, and 200 or more individuals are found on rolling hills and sea cliffs at Lamaloa Gulch. Approximately 40 individuals occur west of Waialua near Kahawaiiki Gulch in the lowland wet ecosystem, and about 10 individuals occur at Kumueli in the montane wet ecosystem. In the montane mesic ecosystem, there are 2 occurrences: 10 to 20 individuals below Puu Kolekole, and 1 individual at Kawela Gulch (Wood and Perlman 2002, pp. 1–2; TNC 2007; HBMP 2008; Oppenheimer 2009a, in litt.; Perlman 2006a, pp. 1–2; Wood 2009b, pp. 1–2).

Bonamia menziesii (NCN) is a perennial liana in the morning glory family (Convolvulaceae). *Bonamia menziesii* is known from Kauai, Oahu, Molokai, Lanai, Maui, and Hawaii Island (Austin 1999, p. 550; HBMP 2008). At the time we designated critical habitat in 2003, *B. menziesii* was known from 3 occurrences on Lanai, 9 occurrences on Kauai, 6 occurrences on Maui, 18 occurrences on Oahu, and 2 occurrences on Hawaii Island (68 FR 1220, January 9, 2003; 68 FR 9116, February 27, 2003; 68 FR 25934, May 14, 2003; 68 FR 35950, June 17, 2003; 68 FR 39624, July 2, 2003). However, no critical habitat was designated for this species on Lanai or Molokai in 2003 (68 FR 1220, January 9, 2003; 68 FR 12982, March 18, 2003). Currently, *B. menziesii* is known from 6 occurrences on Lanai and Maui, totaling over 10 individuals. On Lanai, *B. menziesii* is found at Kanepuu (one individual observed dead in 2008, two other individuals not observed since 2001) and at Puhielelu Ridge (two individuals were observed in 1996) in the lowland mesic ecosystem (TNC 2007; HBMP 2008; Oppenheimer 2010t, in litt.). This species is found on west Maui at Honokowai (two individuals) in the wet cliff ecosystem, and on east Maui at Puu o Kali (one individual), Kaloi (one individual), and Kanaio Natural Area Reserve (four individuals), in the lowland dry ecosystem (TNC 2007; HBMP 2008; Bily 2010, in litt.). This species was last seen in the dry cliff ecosystem on west Maui in 1920 (TNC 2007; HBMP 2008). *Bonamia menziesii* has not been observed on Molokai (in the lowland dry and lowland mesic ecosystems) since the early 1900s (HBMP 2008).

Brighamia rockii (pua ala), a stem succulent in the bellflower family (Campanulaceae), is known from east Molokai and Lanai, and may have occurred on Maui (Lammers 1999, p. 423). At the time we designated critical habitat in on Maui and Molokai in 2003, this species was known from five occurrences on Molokai (68 FR 12982, March 18, 2003; 68 FR 25934, May 14, 2003). Currently, *B. rockii* is found on Molokai at Lepau Point (one individual); at Waiehu, east of Wailele Falls (four individuals), and on Huelo islet (one individual), in the coastal and wet cliff ecosystems (TNC 2007; HBMP 2008; NTBG 2009i; Oppenheimer 2010u, in litt.). This species was last observed on Lanai in 1911, in the dry cliff ecosystem (HBMP 2008). According to Lammers (1999, p. 423), *B. rockii* was likely found in the coastal ecosystem on Maui.

Canavalia molokaiensis (awikiwiki), a perennial climbing herb in the pea family (Fabaceae), is endemic to east Molokai (Wagner and Herbst 1999, p. 653). At the time we designated critical habitat in 2003, this species was known from seven occurrences on Molokai (68 FR 12982, March 18, 2003). Currently, *C. molokaiensis* is found in 9 occurrences totaling approximately 170 individuals in the following locations: Kawailena drainage in Pelekunu Valley (1 individual); Kua Gulch (approximately 100 individuals); near the junction at Kupiaia Gulch (10 to 20 individuals); Waiehu (5 to 10 individuals); west Kawela Gulch (6 individuals); Kukaiwaa (approximately 15 individuals); Mokomoko Gulch (a few individuals); Wailua (10 individuals); and Waialeia Stream (a few individuals) (HBMP 2008; Perlman 2008d, pp. 1–2; Tangalin 2010, in litt.). These plants are found in the coastal, lowland mesic, lowland wet, and wet cliff ecosystems (TNC 2007).

Cenchrus agrimonioides (kamanomano (also known as sandbur or agrimony)), a perennial in the grass family (Poaceae), is known from Lanai, Maui, Oahu, and Hawaii (O'Connor 1999, pp. 1,511–1,512). At the time we designated critical habitat in 2003, *C. agrimonioides* was known from one occurrence on east Maui, one occurrence on west Maui, and seven occurrences on Oahu (HBMP 2008; 68 FR 25934, May 14, 2003; 68 FR 35950, June 17, 2003). Currently, on Maui, *C. agrimonioides* is known from four occurrences totaling five individuals in the lowland dry ecosystem. On west Maui, this variety occurs in Hanaulaiki and Papalaua gulches (one individual at each location). On east Maui, *C. agrimonioides* occurs in Kanaio (2 individuals), and within a fenced exclosure in the Kanio Natural Area Reserve (one individual) (TNC 2007; HBMP 2008; PEPP 2008, pp. 47–48; PEPP 2009, p. 39). This plant was last observed on Lanai in 1915, in the lowland mesic ecosystem (TNC 2007; HBMP 2008).

Clermontia lindseyana (oha wai), a perennial shrub or tree in the bellflower family (Campanulaceae), is known from Maui and Hawaii Island (Lammers 1999, p. 431). At the time we designated critical habitat in 2003, *C. lindseyana* was known from 2 occurrences on Maui and from 15 occurrences on Hawaii Island (68 FR 25934, May 14, 2003; 68 FR 39624, July 2, 2003). Currently, there is 1 known occurrence totaling approximately 30 individuals on east Maui at Wailaulau in the montane mesic ecosystem (TNC 2007; HBMP 2008; PEPP 2009, pp. 40–41; Perlman 2007a, in litt.; Wood 2009c, in litt.; Oppenheimer 2010a, in litt.; Oppenheimer 2010b, in litt.; Oppenheimer 2010v, in litt.; Oppenheimer 2010w, in litt.).

Clermontia oblongifolia ssp. *brevipes* (oha wai), a perennial shrub or tree in the bellflower family (Campanulaceae), is endemic to east Molokai (Lammers 1999, pp. 432–433). At the time we designated critical habitat in 2003, this species was known from one occurrence in Kamakou Preserve (68 FR 12982, March 18, 2003; Perlman 2009d, in litt.). Currently, *C. oblongifolia* ssp. *brevipes* is found in 1 known occurrence totaling 11 individuals on Uapa Ridge in the montane wet ecosystem (TNC 2007; HBMP 2008; Bakutis 2009a, in litt.; Perlman 2009d, in litt.). Historically, this subspecies also occurred in the lowland mesic, lowland wet, and wet

cliff ecosystems (TNC 2007; HBMP 2008).

Clermontia oblongifolia ssp. *mauiensis* (oha wai), a perennial shrub or tree in the bellflower family (Campanulaceae), is known from Lanai and Maui (Lammers 1999, pp. 432–433). At the time we designated critical habitat in 2003, this species was known from one occurrence of two individuals on west Maui, and from historical occurrences on Lanai and east Maui (68 FR 1220, January 9, 2003; 68 FR 25934, May 14, 2003; HBMP 2008; Perlman 2009e, in litt.). However, no critical habitat was designated for this species on Maui in 2003 (68 FR 25934, May 14, 2003). Currently, *C. oblongifolia* ssp. *mauiensis* is found in one known occurrence totaling four individuals along the pipeline of the lower Waikamoi Ditch Trail at Haipuena Gulch in the montane wet ecosystem on east Maui (TNC 2007; HBMP 2008; Perlman 2009e, in litt.). Historically, this species was also found in the lowland mesic and lowland wet ecosystem on Lanai, and the lowland wet ecosystem on Maui (TNC 2007; HBMP 2008). An examination of the type specimen and other collections indicates that *C. oblongifolia* ssp. *mauiensis* may be a hybrid; however, further examination of specimens from Lanai and Maui are necessary (Albert 2001, in litt.; Oppenheimer 2010s, in litt.)

Clermontia peleana (oha wai) is a perennial epiphytic (on *Acacia koa, Cheirodendron trigynum* (olapa), *Cibotium* spp., and *Metrosideros polymorpha*) shrub or tree in the bellflower family (Campanulaceae). There are two subspecies: *C. peleana* ssp. *peleana* (Hawaii Island) and *C. peleana* ssp. *singuliflora* (east Maui and Hawaii Island) (Lammers 1999, p. 435). At the time we designated critical habitat on Maui in 2003, *C. peleana* had not been seen on either island since the early 1900s (68 FR 25934, May 14, 2003; 68 FR 39624, July 2, 2003). Critical habitat was designated on the island of Hawaii in 2003 (68 FR 39624, July 2, 2003). Currently, there are no known individuals of *C. peleana* spp. *singuliflora* on Maui; however, this subspecies was recently rediscovered on Hawaii Island (TNC 2010). *Clermontia peleana* ssp. *singuliflora* was last seen in 1920, on east Maui in the lowland wet ecosystem (TNC 2007; HBMP 2008).

Clermontia samuelii (oha wai), a perennial shrub in the bellflower family (Campanulaceae), is known from Maui (Lammers 1999, p. 436). There are two subspecies: *C. samuelii* ssp. *hanaensis,* which generally is found at lower elevations, and *C. samuelii* ssp. *samuelii* (Lammers *et al.* 1995, p. 344). At the time we designated critical habitat in 2003, *C. samuelii* was known from seven occurrences on east Maui (68 FR 25934, May 14, 2003). Currently, *C. samuelii* ssp. *hanaensis* is found in bog margins in the lowland wet and montane wet ecosystems at Kopiliula, east of Hanawi Stream, and at Kawaipapa, with historical occurrences at Kuhiwa Valley, Palikea Stream, and Waihoi Valley (TNC 2007; HBMP 2008; Oppenheimer 2010b, in litt.; Welton 2010a, in litt.). *Clermontia samuelii* ssp. *samuelii* is found in 2 known occurrences, one along the ridge above Kipahulu rim (about 20 individuals), and another along the south rim of Kipahulu (Manawainui planeze) (about 4 individuals), in the montane wet ecosystem (TNC 2007; HBMP 2008; Welton 2010a, in litt.). There is a report of one individual (subspecies unknown) at Papanalahou Point on west Maui (HBMP 2008).

Colubrina oppositifolia (kauila), a perennial tree in the buckthorn family (Rhamnaceae), is known from Maui, Oahu, and Hawaii (Wagner *et al.* 1999y, p. 1,094). At the time we designated critical habitat in 2003, this species was known from two occurrences on west Maui, five occurrences on Oahu, and five occurrences on Hawaii Island (68 FR 25934, May 14, 2003; 68 FR 35950, June 17, 2003; 68 FR 39624, July 2, 2003). Currently, on west Maui, there are two individuals near Honokowai Gulch in the lowland mesic ecosystem. Historically, this species was also reported from the lowland dry ecosystem on east Maui (TNC 2007; HBMP 2008; Oppenheimer 2009b, in litt.; Perlman 2008e, in litt.).

Ctenitis squamigera (pauoa), a terrestrial fern in the spleenwort family (Aspleniaceae), is known from Kauai, Oahu, Molokai, Lanai, Maui, and the island of Hawaii (Palmer 2003, pp. 100–102). At the time we designated critical habitat on Kauai, Molokai, Maui, and Oahu in 2003, *C. squamigera* was known from 2 occurrences on Lanai, 1 occurrence on Molokai, 12 occurrences on Maui, and 8 occurrences on Oahu (68 FR 1220, January 9, 2003; 68 FR 12982, March 18, 2003; 68 FR 25934, May 14, 2003; 68 FR 35950, June 17, 2003). No critical habitat was designated for this species on Lanai or Hawaii in 2003 (68 FR 1220, January 9, 2003; 68 FR 39624, July 2, 2003). Currently, *C. squamigera* is found in 12 known occurrences totaling over 120 individuals on Lanai, Molokai, and west Maui (Oppenheimer 2010i, in litt.). On Lanai, an unknown number of individuals occur on the leeward (south) side of the island at Waiapaa in the wet cliff ecosystem. There are historical records from the dry cliff and wet cliff ecosystems at upper Kehewai Gulch, Haalelepaakai, and Kaiholena (HBMP 2008). On Molokai, 20 individuals occur at Wawaia in the lowland mesic ecosystem. On west Maui, there are 9 occurrences totaling 80 to 84 individuals in the lowland dry, lowland mesic, lowland wet, montane mesic, and wet cliff ecosystems. *Ctenitis squamigera* is found in Honokowai Valley (20 individuals), Puu Kaeo (2 to 4 individuals), Kahana Iki (1 individual), Kahana (14 individuals), Kanaha Valley (10 individuals), Kahoma (1 individual), Puehuehunui (1 to 2 individuals), Ukumehame Valley below the Hanaula Reservoir (1 to 2 individuals), and Iao Valley (approximately 30 individuals). On east Maui, there are 28 individuals at Pohakea in the lowland dry ecosystem and a historical record from the lowland mesic ecosystem. This species was apparently found in the Kipahulu FR (Kaapahu) area on east Maui, but no further details have been provided (Wood and Perlman 2002, p. 7; East Maui Watershed Partnership 2006, p. 17; TNC 2007; HBMP 2008; Oppenheimer 2010r, in litt.).

Cyanea copelandii ssp. *haleakalaensis* (HAHA), a vine-like shrub in the bellflower family (Campanulaceae), is known from Maui (Lammers 1999, pp. 445–446). At the time we designated critical habitat in 2003, this subspecies was known from five occurrences on Maui (68 FR 25934, May 14, 2003). Currently, *C. copelandii* ssp. *haleakalaensis* is found in 7 widely distributed occurrences totaling over 600 individuals on east Maui. One occurrence of over 20 scattered individuals is found in east Makaiwa in the lowland wet ecosystem; 4 occurrences totaling approximately 100 individuals are found along streams in Keanae in the lowland wet and montane wet ecosystems; 2 occurrences totaling approximately 500 individuals are found along Palikea Stream and in Kipahulu Valley, in the montane wet, wet cliff, and lowland wet ecosystems; and a few individuals are found at Kaapahu in the montane wet and lowland mesic ecosystems (Haleakala National Park 2004, pp. 5–6; 2005, pp. 5–6; 2007, pp. 2,4; TNC 2007; HBMP 2008; Bily *et al.* 2008, p. 37; Welton and Haus 2008, pp. 12–13; Oppenheimer 2010b, in litt.; 2010x, in litt.; Perlman 2007b, in litt.; Welton 2010a, in litt.; Wood 2009d, in litt.).

Cyanea dunbariae (HAHA), which is currently listed as *Cyanea dunbarii* and for which we are proposing a spelling correction to *Cyanee dunbariae,* is a shrub in the bellflower family

(Campanulaceae), and is endemic to Molokai (Lammers 1999, p. 448). At the time we designated critical habitat in 2003, this species was known from one occurrence at Mokomoko Gulch (68 FR 12982, March 18, 2003). Currently, there are 10 individuals in Mokomoko Gulch in the lowland mesic ecosystem (TNC 2007; HBMP 2008; PEPP 2008, p. 48; Oppenheimer 2010u, in litt.; NTBG 2011a). Historically, this species was also found in Molokai's lowland wet and montane mesic ecosystems (TNC 2007; HBMP 2008).

Cyanea gibsonii (HAHA), which is currently listed as *Cyanea macrostegia* ssp. *gibsonii* and for which we are proposing a taxonomic revision to *Cyanea gibsonii,* is a perennial tree in the bellflower family (Campanulaceae), and is known from Lanai (Lammers 1999, p. 457). In 2003, this species was known from two occurrences (68 FR 1220, January 9, 2003). However, no critical habitat was designated for this species on Lanai in 2003 (68 FR 1220, January 9, 2003). Currently, there are about 10 to 20 individuals at the head of Hauola Gulch, in the montane wet ecosystem (TNC 2007; HBMP 2008; PEPP 2009, p. 53; Oppenheimer 2010t, in litt.). Historically, this species was also found north of Lanaihale and at Puu Alii in the wet cliff and montane wet ecosystems (PEPP 2009, p. 53).

Cyanea glabra (HAHA), a perennial shrub in the bellflower family (Campanulaceae), is endemic to Maui (Lammers 1999, pp. 449, 451). At the time we designated critical habitat in 2003, this species was known from one occurrence on west Maui (68 FR 25934, May 14, 2003). However, on west Maui, individuals identified as *C. glabra* in the lowland wet and wet cliff ecosystems may be an undescribed species related to *C. acuminata* (Lorence 2010, in litt.; Oppenheimer 2010y, in litt.). On east Maui, wild individuals of *C. glabra* in the montane wet and montane mesic ecosystems may more closely resemble *C. maritae,* one of the species proposed for listing in this rule (Oppenheimer 2010y, in litt.). Further taxonomic study of these occurrences is needed (TNC 2007; HBMP 2008; Perlman 2009f, in litt.). In the meantime, we will continue to identify these individuals as *C. glabra.*

Cyanea hamatiflora ssp. *hamatiflora* (HAHA), a perennial palm-like tree in the bellflower family (Campanulaceae), is known from east Maui (Lammers 1999, p. 452). At the time we designated critical habitat in 2003, there were nine occurrences (68 FR 25934, May 14, 2003). Currently, there are at least 9 occurrences totaling between 458 and 558 individuals in the lowland wet and montane wet ecosystems, at Haipuaena Stream, east of east Wailuaiki Stream, above Kuhiwa Valley, in Kipahulu Valley, and at Kaapahu (TNC 2007; HBMP 2008; PEPP 2008, pp. 50–51; Welton and Haus 2008, p. 26; Oppenheimer 2010b, in litt.; Welton 2010a, in litt.). Historically, this subspecies also occurred in the montane mesic ecosystem (TNC 2007; HBMP 2008).

Cyanea lobata (HAHA), a shrub in the bellflower family (Campanulaceae), is known from two subspecies, *C. lobata* ssp. *baldwinii* (Lanai) and *C. lobata* ssp. *lobata* (west Maui) (Lammers 1999, pp. 451, 454). At the time we designated critical habitat on Maui in 2003, there were no known occurrences of *C. lobata* ssp. *baldwinii* on Lanai and five occurrences of *C. lobata* ssp. *lobata* on west Maui (68 FR 1220, January 9, 2003; 68 FR 25934, May 14, 2003). However, no critical habitat was designated for this species on Lanai in 2003 (68 FR 1220, January 9, 2003). In 2006, *C. lobata* ssp. *baldwinii* was rediscovered around the Hauola headwaters on Lanai, in the montane wet ecosystem (Wood 2006a, p. 15; TNC 2007; Wood 2009e, in litt.). Currently, there are three to four individuals at this location (Perlman 2007c, in litt.; Oppenheimer 2009c, in litt.; PEPP 2009, p. 53). On west Maui, there are five occurrences of *C. lobata* ssp. *lobata* totaling eight individuals at Honokohau, Honokowai, and Mahinahina, in the lowland wet and wet cliff ecosystems (TNC 2007; HBMP 2008; Oppenheimer 2010i, in litt.).

Cyanea mannii (HAHA), a perennial shrub in the bellflower family (Campanulaceae), is endemic to east Molokai (Lammers 1999, p. 456). At the time we designated critical habitat in 2003, there were eight occurrences at Puu Kolekole and Kawela Gulch (68 FR 12982, March 18, 2003). Currently, there are fewer than 200 individuals in 11 occurrences extending across the summit area from Mokomoko Gulch to Kua Gulch, in the lowland mesic, montane mesic, and montane wet ecosystems (Wood and Perlman 2002, p. 2; TNC 2007; HBMP 2008; Perlman 2002a, in litt.; Wood 2009f, in litt.; Oppenheimer 2010u, in litt.).

Cyanea mceldowneyi (HAHA), a perennial shrub in the bellflower family (Campanulaceae), is found on east Maui (Lammers 1999, p. 457). At the time we designated critical habitat in 2003, this species was known from 11 occurrences (68 FR 25934, May 14, 2003). Currently, *C. mceldowneyi* is known from at least 10 occurrences totaling over 100 individuals in the lowland wet, montane wet, and montane mesic ecosystems (PEPP 2007, p. 39; TNC 2007; HBMP 2008; PEPP 2008, pp. 53–54; PEPP 2009, pp. 53, 57; Oppenheimer 2010b, in litt.).

Cyanea procera (HAHA), a perennial tree in the bellflower family (Campanulaceae), is known from Molokai (Lammers 1999, p. 460). At the time we designated critical habitat in 2003, this species was known from five occurrences (68 FR 12982, March 18, 2003). Currently, there are one to two individuals near Puuokaeha in west Kawela Gulch in the montane mesic ecosystem (TNC 2007; PEPP 2008, pp. 55–56; Oppenheimer 2010u, in litt.; NTBG 2011b). Historically, this species was also found in the lowland mesic and montane wet ecosystems (TNC 2007; HBMP 2008).

Cyperus fauriei (NCN), which is currently listed as *Mariscus fauriei* and for which we are proposing a taxonomic revision to *Cyperus fauriei,* is a perennial in the sedge family (Cyperaceae), and is known from Molokai, Lanai, and the island of Hawaii (Koyama 1999, p. 1,417). At the time we designated critical habitat in 2003, *C. fauriei* was known from 1 occurrence of 20 to 30 individuals on Molokai and 2 occurrences on the island of Hawaii (68 FR 12982, March 18, 2003; 68 FR 39624, July 2, 2003). Currently, on Molokai, an unknown number of individuals are found in the area west of Makolelau, at Kamakou Preserve above Onini Road, at Makakupaia, at Waihanau drainage, and at Kamalo, in the lowland mesic and montane mesic ecosystems (TNC 2007; HBMP 2008; Oppenheimer 2010u, in litt.). *Cyperus fauriei* was last observed on Lanai in the early 1900s, in the lowland dry ecosystem (TNC 2007; HBMP 2008).

Cyperus pennatiformis (NCN), which is currently listed as *Mariscus pennatiformis* and for which we proposed a taxonomic revision on August 2, 2011 (76 FR 46362), is a perennial in the sedge family (Cyperaceae), and is known from Laysan Island, Kauai, Oahu, east Maui, and the island of Hawaii (Koyama 1999, pp. 1,421–1,423). There are two varieties: *C. pennatiformis* var. *bryanii* (Laysan) and *C. pennatiformis* var. *pennatiformis* (main Hawaiian Islands). At the time we designated critical habitat on Laysan, Kauai, Maui, and Oahu in 2003, this species was known from only one occurrence (totaling an unknown number of individuals) on Laysan Island (*C. pennatiformis* var. *bryanii*), and one occurrence (totaling 30 individuals) on east Maui (*C. pennatiformis* var. *pennatiformis*) (68 FR 9116, February 27, 2003; 68 FR 25934, May 14, 2003; 68 FR 28054, May 22, 2003; 68 FR

35950, June 17, 2003). Both occurrences were in the coastal ecosystem (68 FR 25934, May 14, 2003; 68 FR 28054, May 22, 2003). The known occurrence of *C. pennatiformis* var. *pennatiformis* in the coastal ecosystem on east Maui has not been relocated (Wagner *et al.* 2005; HBMP 2008).

Cyperus trachysanthos (puukaa), a grass-like perennial in the sedge family (Cyperaceae), is known from the islands of Niihau, Kauai, Oahu, Molokai, and Lanai (Koyama 1999, pp. 1,399–1,400). At the time we designated critical habitat in 2003, *C. trachysanthos* was found on Kauai and Oahu (68 FR 9116, February 27, 2003; 68 FR 35950, June 17, 2003). This species has not been observed on the islands of Lanai and Molokai, in the lowland dry ecosystems since 1912 and 1919, respectively (TNC 2007; HBMP 2008).

Cyrtandra munroi (haiwale), a perennial shrub in the African violet family (Gesneriaceae), is known from Lanai and west Maui (Wagner *et al.* 1999d, p. 770; 68 FR 25934, May 14, 2003). At the time we designated critical habitat on Maui in 2003, *C. munroi* was known from two occurrences on Lanai and five occurrences on west Maui (68 FR 1220, January 9, 2003; 68 FR 25934, May 14, 2003). However, no critical habitat was designated for this species on Lanai (68 FR 1220, January 9, 2003). Currently, on Lanai, *C. munroi* is found 3 occurrences totaling 23 individuals at Puu Alii (20 individuals), Waialala Gulch (1 individual), and Lanaihale (2 individuals), in the montane wet and wet cliff ecosystems (TNC 2007; HBMP 2008; Oppenheimer 2010u, in litt.). On west Maui, *C. munroi* is found in 6 occurrences totaling 45 individuals at Makamakaole Gulch (1 individual), Honokohau Gulch (1 individual), Kahana Valley (1 individual), Hahakea Gulch (1 individual), Kapunakea Preserve (12 individuals), and Amalu Stream (29 individuals), in the lowland wet and wet cliff ecosystems (TNC 2007; HBMP 2008; Oppenheimer 2010i, in litt.).

Diplazium molokaiense (NCN), a terrestrial fern in the spleenwort family (Aspleniaceae), is known from all of the major Hawaiian Islands except Hawaii Island (Palmer 2003, p. 125). At the time we designated critical habitat on Kauai, Molokai, Maui, and Oahu in 2003, *D. molokaiense* was known only from east Maui (68 FR 9116, February 27, 2003; 68 FR 12982, March 18, 2003; 68 FR 25934, May 14, 2003; 68 FR 35950, June 17, 2003). Currently, *D. molokaiense* is known from three occurrences on Maui. On west Maui, there are five individuals at Puehuehunui in the montane mesic ecosystem. On east Maui, there are 2 occurrences, one at Honomanu (about 15 individuals) in the montane wet ecosystem, and one in the Kula FR (about 50 individuals) in the montane mesic ecosystem (Wood 2006b, pp. 32–34; TNC 2007; Wood 2007, p. 14; HBMP 2008; PEPP 2009, p. 71). *Diplazium molokaiense* occurred historically in the dry cliff ecosystem on east Maui, and the lowland wet and dry cliff ecosystems on west Maui (TNC 2007; HBMP 2008). It was also found in the lowland mesic and dry cliff ecosystems on Lanai, and in the lowland mesic ecosystem on Molokai (TNC 2007; HBMP 2008).

Dubautia plantaginea ssp. *humilis* (naenae), a perennial shrub or small tree in the sunflower family (Asteraceae), is known from west Maui (Carr 1999b, pp. 304–305). At the time we designated critical habitat in 2003, *D. plantaginea* ssp. *humilis* was known from 2 occurrences totaling 60 to 65 individuals on west Maui (68 FR 25934, May 14, 2003). Currently, *D. plantaginea* ssp. *humilis* is known from 1 occurrence of 35 individuals in Iao Valley, in the wet cliff ecosystem (TNC 2007; HBMP 2008; PEPP 2009, p. 72; Oppenheimer 2010i, in litt.).

Eugenia koolauensis (nioi), a perennial shrub or small tree in the myrtle family (Myrtaceae), is known from Oahu and Molokai (Wagner *et al.* 1999w, p. 960). At the time we designated critical habitat on Molokai and Oahu in 2003, this species was only known from 12 occurrences on Oahu (68 FR 12982, March 18, 2003; 68 FR 35950, June 17, 2003). Currently, *E. koolauensis* is extant only on Oahu. This species was last seen on Molokai in 1920, in the lowland dry ecosystem (TNC 2007; HBMP 2008).

Flueggea neowawraea (mehamehame) is a perennial tree in the family Euphorbiaceae. This species is known from Kauai, Oahu, Molokai, Maui, and the island of Hawaii (Hayden 1999, pp. 620–621). At the time we designated critical habitat on those islands in 2003, there were 100 occurrences on Kauai, 4 occurrences on Maui, 23 occurrences on Oahu, and 2 occurrences on the island of Hawaii (68 FR 9116, February 27, 2003; 68 FR 12982, March 18, 2003; 68 FR 25934, May 14, 2003; 68 FR 35950, June 17, 2003; 68 FR 39624, July 2, 2003). *Flueggea neowawraea* was last observed at Waihii on Molokai in 1931 (HBMP 2008). Currently, two individuals of *F. neowawraea* are found on east Maui's southern flank of Haleakala at Auwahi, in the lowland dry ecosystem (PEPP 2009, p. 73; Oppenheimer 2010b, in litt.). *Flueggea neowawraea* was last observed on Molokai in 1931 at Waianui, in the lowland mesic ecosystem (HBMP 2008).

Geranium arboreum (Hawaiian red-flowered geranium), a perennial shrub in the geranium family (Geraniaceae), is known from east Maui (Wagner *et al.* 1999e, p. 729). At the time we designated critical habitat in 2003, there were 12 occurrences totaling 158 individuals (68 FR 25934, May 14, 2003). Currently, there are 5 occurrences totaling fewer than 30 individuals in east Maui's montane mesic and subalpine ecosystems. Historically, *G. arboreum* was also found in the montane dry ecosystem (TNC 2007; HBMP 2008; Oppenheimer 2009d, in litt.; Perlman 2009g, in litt.; Wood 2009g, in litt.; Oppenheimer 2010b, in litt.; Welton 2010a, in litt.).

Geranium multiflorum (nohoanu), a perennial shrub in the geranium family (Geraniaceae), is known from east Maui (Wagner *et al.* 1999e, pp. 733–734). At the time we designated critical habitat in 2003, there were 13 occurrences. Due to the inaccessibility of the plants, and the difficulty in determining the number of individuals (because of the plant's multi-branched form), the total number of individuals of this species was not known; however, it was assumed to not exceed 3,000 (68 FR 25934, May 14, 2003). Currently, *G. multiflorum* is found in nine occurrences on east Maui, from Koolau Gap to Kalapawili Ridge, in the subalpine, montane mesic, and montane wet ecosystems. It is estimated there may be as many as 500 to 1,000 individuals (Bily *et al.* 2003, pp. 4–5; TNC 2007; HBMP 2008; Perlman 2009h, in litt.; Wood 2009h, in litt.; Oppenheimer 2010b, in litt.).

Gouania hillebrandii (NCN), a perennial shrub in the buckthorn family (Rhamnaceae), is known from Molokai, Lanai, Maui, and Kahoolawe (Wagner *et al.* 1999z, p. 1,095). At the time we designated critical habitat in 1984 on Maui, there was one occurrence (49 FR 44753, November 9, 1984). Currently, on Molokai, there is 1 occurrence of about 50 individuals at Puu Kolekole in the lowland mesic ecosystem (USFWS 1990, pp. 4–10; TNC 2007; PEPP 2008, p. 61; Perlman 2008f, in litt.; Wood 2009i, in litt.). On west Maui, there are fewer than 1,000 individuals in the lowland dry ecosystem (TNC 2007; HBMP 2008; Oppenheimer 2010i, in litt.). This species was last observed on Lanai and Kahoolawe in the 1800s (HBMP 2008).

Gouania vitifolia (NCN), a perennial climbing shrub or woody vine in the buckthorn family (Rhamnaceae), is known from Oahu, Maui, and the island of Hawaii (Wagner *et al.* 1999z, p. 1,097). At the time we designated

critical habitat on Maui, Oahu, and Hawaii in 2003, *G. vitifolia* was only known from two occurrences on Oahu and one occurrence on the island of Hawaii (68 FR 25934, May 14, 2003; 68 FR 35950, June 17, 2003; 68 FR 39624, July 2, 2003). Currently, botanists are searching potentially suitable habitat in the wet cliff ecosystem on west Maui where *G. vitifolia* was last seen in the 1800s (TNC 2007; HBMP 2008; Oppenheimer 2010z, in litt.).

Hesperomannia arborescens (NCN), a perennial shrubby tree in the sunflower family (Asteraceae), is known from Oahu, Molokai, Lanai, and Maui (Wagner *et al.* 1999m, p. 325). At the time we designated critical habitat on Molokai and Oahu in 2003, *H. arborescens* was known from 1 occurrence on Molokai, 4 occurrences on west Maui, and 36 occurrences on Oahu (68 FR 12982, March 18, 2003; 68 FR 25934, May 14, 2003; 68 FR 35950, June 17, 2003). However, no critical habitat was designated for this species on Maui in 2003 (68 FR 25934, May 14, 2003). Currently, there are five or six occurrences on Molokai and Maui totaling 122 to 125 individuals. On Molokai, there are 30 individuals between Wailau and Pelekunu in the wet cliff ecosystem. Historically, this species was also reported from the montane wet ecosystem (HBMP 2008). On west Maui, 4 or 5 occurrences totaling 92 to 95 individuals are found in the lowland wet and wet cliff ecosystems, in Honokohau (30 individuals), Waihee (approximately 60 individuals), Kapilau Ridge (1 individual), and Lanilili (1 individual). There is some question regarding the identification of three individuals in Iao Valley (HBMP 2008; Oppenheimer 2010i, in litt.). This species has not been observed since 1940 on Lanai, in the wet cliff ecosystem (TNC 2007; HBMP 2008). The results of a recent research study indicate that the plants on Oahu may be genetically distinct from plants on Molokai and Lanai (Ching-Harbin 2003, p. 81).

Hesperomannia arbuscula (NCN), a tree or shrub in the sunflower family (Asteraceae), is known from Oahu and west Maui (Wagner *et al.* 1999m, p. 325). At the time we designated critical habitat in 2003, eight occurrences were found on west Maui, and six occurrences were known from Oahu (68 FR 25934, May 14, 2003; 68 FR 35950, June 17, 2003). Currently, on west Maui, there are three individuals in Iao Valley, in the lowland wet ecosystem (TNC 2007; HBMP 2008; Oppenheimer 2010aa, in litt.). This species was last observed in the 1990s in the wet cliff, dry cliff, and lowland dry ecosystems on west Maui (TNC 2007; HBMP 2008).

Hibiscus arnottianus ssp. *immaculatus* (kokio keokeo), a tree in the mallow family (Malvaceae), is endemic to east Molokai (Bates 1999, pp. 882–883). At the time we designated critical habitat in 2003, this subspecies was known from three occurrences on east Molokai (68 FR 12982, March 18, 2003). Currently, *H. arnottianus* ssp. *immaculatus* is found in 5 occurrences, totaling fewer than 100 individuals, from Waiehu to Papalaua in the coastal and wet cliff ecosystems (TNC 2007; HBMP 2008; NTBG 2009j; Perlman 2002b, in litt.; Wood 2009j, in litt.; Oppenheimer 2010u, in litt.).

Hibiscus brackenridgei (mao hau hele) is a perennial shrub or small tree in the mallow family (Malvaceae). This species is known from the islands of Kauai, Oahu, Molokai, Lanai, Maui, Hawaii, and possibly Kahoolawe. There are three subspecies: *H. brackenridgei* ssp. *brackenridgei* (Lanai, Maui, and Hawaii), *H. brackenridgei* ssp. *mokuleianus* (Kauai and Oahu), and *H. brackenridgei* ssp. *molokaiana* (Molokai and Oahu) (Wilson 1993, p. 278; Bates 1999, pp. 885–886). At the time we designated critical habitat on Molokai, Maui, Oahu, and Hawaii in 2003, *H. brackenridgei* ssp. *brackenridgei* was known from 2 occurrences on Lanai, 5 occurrences on Maui, and 4 occurrences on Hawaii, and *H. brackenridgei* ssp. *mokuleianus* was known from 5 occurrences totaling fewer than 206 individuals on Oahu. *Hibiscus brackenridgei* ssp. *molokaiana* was reported from one occurrence on Oahu and had not been seen on Molokai since 1920 (68 FR 12982, March 18, 2003; 68 FR 25934, May 14, 2003; 68 FR 35950, June 17, 2003; 68 FR 39624, July 2, 2003). No critical habitat was designated for this species on Lanai in 2003 (68 FR 1220, January 9, 2003). Currently, *H. brackenridgei* ssp. *brackenridgei* is extant on the islands of Lanai, Maui, and Hawaii. On Lanai, there are two individuals within fenced exclosures on Keomuku Road, and one individual within a fenced exclosure at Kaena; both exclosures are in the lowland dry ecosystem. Historically, this subspecies was also known from Lanai's coastal ecosystem (TNC 2007; Oppenheimer 2010t, in litt.). On west Maui, there are a few individuals in Kaonohue Gulch in the lowland dry ecosystem. On east Maui, there is 1 occurrence of about 10 individuals in a small gulch downslope from the historical location at Keokea, in the lowland dry ecosystem (TNC 2007; PEPP 2008, pp. 64–65; PEPP 2009, pp. 76–78; Oppenheimer 2010t, in litt.; 2010u, in litt.; 2010bb, in litt). Historically, on Molokai, *Hibiscus brackenridgei* ssp. *molokaiana* was found in the coastal ecosystem at Kihaapilani (TNC 2007; HBMP 2008).

Huperzia mannii (wawaeiole), is a fern ally in the hanging fir-moss family (Lycopodiaceae) that is typically epiphytic on native plants such as *Metrosideros polymorpha* or *Acacia koa.* This species is known from Kauai, Maui, and the island of Hawaii (Palmer 2003, p. 256). At the time we designated critical habitat on Kauai and Maui in 2003, this species was known from Maui and the island of Hawaii (68 FR 25934, May 14, 2003). No critical habitat was designated for this species on Hawaii in 2003 (68 FR 39624, July 2, 2003). Currently, on Maui there are 6 occurrences totaling 97 to 100 individuals. On west Maui, 14 to 17 individuals of *H. mannii* occur in the Lihau section of the West Maui Natural Area Reserve, in the montane mesic ecosystem. This species also occurred historically in the lowland wet and montane wet ecosystems (HBMP 2008). On east Maui, 2 individuals are reported north of Waikamoi Preserve at Puuokakae and Opana Gulch, in the montane wet ecosystem; 10 individuals occur at Kipahulu in the lowland wet ecosystem; approximately 40 individuals occur at Cable Ridge in the lowland mesic ecosystem; approximately 30 individuals occur at Kaapahu in the lowland mesic ecosystem; and 1 individual was observed at Manawainui (Kipahulu FR) in the montane mesic ecosystem (Haleakala National Park 2004, pp. 5–7; Haleakala National Park 2006, p. 3; TNC 2007; HBMP 2008; Perlman 2009i, in litt., 2009j, in litt.; Wood 2009k, in litt.; Welton and Haus 2008, pp. 12–13; Welton 2010a, in litt.).

Ischaemum byrone (Hilo ischaemum), a perennial in the grass family (Poaceae), is known from Kauai, Oahu, Molokai, east Maui and the island of Hawaii (O'Connor 1999, pp. 1,556–1,557). At the time we designated critical habitat in 2003, *I. byrone* was known from two occurrences on Kauai, two occurrences on Molokai, six occurrences on Maui, and six occurrences on Hawaii Island (68 FR 9116, February 27, 2003; 68 FR 12982, March 18, 2003; 68 FR 25934, May 14, 2003; 68 FR 39624, July 2, 2003). Currently, *I. byrone* is known from six or more occurrences on Molokai and Maui, totaling as many as several thousand individuals. On Molokai, *I. byrone* is relatively common in the coastal ecosystem from Wailau to Waiehu, and there are an estimated 200 individuals (TNC 2007; HBMP 2008; Oppenheimer 2009e, in litt.). On east

Maui, there are an unknown number of individuals at Pauwalu Point; 20 individuals in scattered patches at Mokuhuki islet; many individuals at Keawaiki Bay; and an unknown number of individuals on the shoreline at Kalahu Point, and at Waiohonu Stream outlet and Muolea Point, all in the coastal ecosystem. These occurrences may total several thousands of individuals, depending on rainfall (TNC 2007; HBMP 2008; Oppenheimer 2010b, in litt.).

Isodendrion pyrifolium (wahine noho kula), a perennial shrub in the violet family (Violaceae), is known from Niihau, Oahu, Molokai, Lanai, Maui, and Hawaii (Wagner *et al.* 1999aa, p. 1,331). At the time we designated critical habitat on Molokai, Maui, and Oahu in 2003, *I. pyrifolium* was known from a single occurrence on the island of Hawaii (68 FR 12982, March 18, 2003; 68 FR 35950, June 17, 2003; 68 FR 39624, July 2, 2003). Currently, there are no extant occurrences on Lanai, Molokai, or Maui. Historically, *I. pyrifolium* was found on Molokai in the lowland mesic ecosystem, and on west Maui in the lowland wet, dry cliff, and wet cliff ecosystems. We have no habitat information for the historical occurrences on Lanai (TNC 2007; HBMP 2008; PEPP 2008, p.103).

Kadua cordata ssp. *remyi* (kopa), which is currently listed as *Hedyotis schlechtendahliana* var. *remyi* and for which we are proposing a taxonomic revision in this rule to *Kadua cordata* ssp. *remyi,* is a perennial subshrub in the coffee family (Rubiaceae), and is known from Lanai (Wagner *et al.* 1999a, pp. 1,150–1,152). In 2003, this subspecies was known from eight individuals; however, no critical habitat was designated for this subspecies on Lanai (68 FR 1220, January 9, 2003). Currently, two wild and three out-planted individuals are reported from Kaiholena-Hulopoe ridge, in the lowland wet ecosystem. Historically, this species also occurred in the lowland mesic ecosystem (TNC 2007; HBMP 2008; PEPP 2009, pp. 5, 82; Oppenheimer 2010cc, in litt.).

Kadua coriacea (kioele), which is currently listed as *Hedyotis coriacea* but for which we proposed a taxonomic revision to *Kadua coriacea* on August 2, 2011, at 76 FR 46362, is a perennial shrub in the coffee family (Rubiaceae), and is known from Oahu, Maui, and the island of Hawaii (Wagner *et al.* 1999a, p. 1,141). At the time we designated critical habitat on Maui and Oahu in 2003, this species was known from one individual in the lowland dry ecosystem at Lihau, on west Maui, and four occurrences on the island of Hawaii (68 FR 25934, May 14, 2003; 68 FR 35950, June 17, 2003). However, no critical habitat was designated for this species on Hawaii in 2003 (68 FR 39264, July 2, 2003). In 2008, the only known individual on Maui was burned during a wildfire and died (PEPP 2008, p. 67).

Kadua laxiflora (pilo), which is currently listed as *Hedyotis mannii* and for which we are proposing a taxonomic revision to *Kadua laxiflora* in this rule, is a perennial subshrub in the coffee family (Rubiaceae), and is known from Molokai, Lanai, and west Maui (Wagner *et al.* 1999a, p. 1,148). At the time we designated critical habitat on Maui in 2003, this species was known from a total of five occurrences on Lanai (two occurrences), Molokai (one occurrence), and west Maui (two occurrences) (68 FR 1220, January 9, 2003; 68 FR 12982, March 18, 2003; 68 FR 25934, May 14, 2003). However, no critical habitat was designated for this species on Lanai or Molokai in 2003 (68 FR 1220, January 9, 2003; 68 FR 12982, March 18, 2003). Currently, on Lanai, there are two individuals at Hauola Gulch in the montane wet ecosystem. There are historical reports from the lowland mesic, lowland wet, and wet cliff ecosystems on this island. On west Maui, there are four individuals at Kauaula Valley, in the wet cliff ecosystem. Historically, this species was also reported from the lowland wet and dry cliff ecosystems (TNC 2007; HBMP 2008; Oppenheimer 2009f, in litt.; PEPP 2009, pp. 3, 14, 24, 82–83; Perlman 2008g, in litt.;) There are no extant individuals on Molokai, although there are historical reports from the lowland mesic and montane mesic ecosystems (TNC 2007; HBMP 2008).

Kanaloa kahoolawensis (kohe malama malama o kanaloa), a perennial shrub in the pea family (Fabaceae), occurs only on Kahoolawe (Lorence and Wood 1994, p. 137). Soil cores suggest *K. kahoolawensis* was quite widespread in lowland dry areas throughout the main Hawaiian Islands during the early Pleistocene (Burney *et al.* 2001, p. 632; Athens 2002, p. 74). At the time we designated critical habitat in 2003, *K. kahoolawensis* was known from two individuals on the Aleale sea stack on the south central coast of Kahoolawe (68 FR 25934, May 14, 2003). Currently, *K. kahoolawensis* is known from the same location with one surviving individual, in the coastal ecosystem (TNC 2007; HBMP 2008; NTBG 2008).

Kokia cookei (Cooke's kokio), a small tree in the mallow family (Malvaceae), is known from Molokai, historically in the lowland dry ecosystem (Bates 1999, p. 890; TNC 2007; HBMP 2008). At the time *K. cookei* was listed in 1979, there were no individuals remaining in the wild, and one individual in an arboretum on Oahu, and no critical habitat was designated for this species on Molokai (44 FR 62470, October 30, 1979; 68 FR 12982, March 18, 2003). Currently, one individual is in cultivation at Waimea Arboretum, and there are propagules at the Volcano Rare Plant Facility, Lyon Arboretum, Amy Greenwell Ethnobotanical Garden, Leeward Community College, Hoolawa Farms, and Maui Nui Botanical Garden (Seidman 2007, in litt.; Orr 2007, in litt.).

Labordia tinifolia var. *lanaiensis* (kamakahala), a perennial shrub or small tree in the logania family (Loganiaceae), is known from Lanai (Wagner *et al.* 1999z, pp. 861–862). In 2003, this variety was known from one occurrence totaling three to eight individuals along the summit of Lanaihale; however, no critical habitat was designated for this species on Lanai (68 FR 1220, January 9, 2003). Currently, *L. tinifolia* var. *lanaiensis* is found in one occurrence of at least five individuals in the head waters of Awehi Gulch on the southeastern end of the summit ridge of Lanaihale, in the wet cliff ecosystem. This variety was historically also found in the lowland mesic, lowland wet, and montane wet ecosystems (TNC 2007; HBMP 2008; Oppenheimer 2010t, in litt.; Oppenheimer 2010d, in litt.).

Labordia triflora (kamakahala), a perennial shrub or small tree in the logania family (Loganiaceae), is known from east Molokai (Wagner *et al.* 1999z, p. 423). At the time we designated critical habitat in 2003, this species was known from 10 individuals (68 FR 12982, March 18, 2003). Currently, 4 occurrences totaling 20 individuals are reported from Kua, Wawaia, Kumueli, and Manawai Gulch, in the lowland mesic ecosystem (TNC 2007; PEPP 2007, p. 48; HBMP 2008; PEPP 2008, p. 85).

Lysimachia lydgatei (NCN), a shrub in the primrose family (Primulaceae), is known from west Maui (Wagner *et al.* 1999bb, p. 1,082). At the time we designated critical habitat in 2003, there were four occurrences (68 FR 25934, May 14, 2003). Currently, there are 2 occurrences totaling approximately 30 individuals. Both occurrences are found at Puehuehunui, in the montane mesic and wet cliff ecosystems (TNC 2007; HBMP 2008; Oppenheimer 2010dd, in litt.; Perlman 1997, in litt.; Wood 2009l, in litt.). This species is also historically known from the lowland dry ecosystem on west Maui (TNC 2007; HBMP 2008).

Lysimachia maxima (NCN), a perennial shrub in the primrose family (Primulaceae), is known from Molokai

(Wagner *et al.* 1999bb, p. 1,083). At the time we designated critical habitat in 2003, this species was known from one occurrence (68 FR 12982, March 18, 2003). Currently, *L. maxima* is known from 2 occurrences totaling 28 individuals on east Molokai. There are 20 individuals near Ohialele along the Pelekunu rim, and 8 individuals in 2 distinct patches in east Kawela Gulch, in the lowland wet and montane wet ecosystems (PEPP 2007, p. 48; TNC 2007; HBMP 2008; PEPP 2008, p. 85).

Marsilea villosa (ihi ihi), a perennial fern in the marsilea family (Marsileaceae), is known from Niihau, Oahu, and Molokai (Palmer 2003, pp. 180–182). At the time we designated critical habitat on Oahu in 2003, this species was found in four occurrences on Molokai, and in five occurrences on Oahu (68 FR 12982, March 18, 2003; 68 FR 35950, June 17, 2003). No critical habitat was designated for this species on Molokai in 2003 (68 FR 12982, March 18, 2003). Currently, *M. villosa* is known from eight occurrences on Molokai, totaling possibly thousands of individuals in areas that flood periodically, such as small depressions and flood plains with clay soils. There is one small occurrence at Kamakaipo, north of Laau Point, and seven occurrences between Kaa and Ilio Point, covering areas from 20 sq ft (6 sq m) to over 2 ac (0.8 ha), all in the coastal ecosystem (TNC 2007; HBMP 2008; Bakutis 2009b, in litt.; Chau 2010, in litt.; Garnett 2010b in litt.; Oppenheimer 2010u, in litt.; Perlman 2006b, in litt.; Wood 2009m, in litt.).

Melanthera kamolensis (nehe), which is currently listed as *Lipochaeta kamolensis* and for which we are proposing a taxonomic revision to *Melanthera kamolensis* in this rule, is a perennial herb in the sunflower family (Asteraceae), and is known from east Maui (Wagner *et al.* 1990a, p. 337). At the time we designated critical habitat in 2003, this species was known from one occurrence (68 FR 25934, May 14, 2003). Currently, a single occurrence of *M. kamolensis* is found in Kamole Gulch, totaling between 30 and 40 individuals, in the lowland dry ecosystem. A second occurrence just west of Kamole appears to be a hybrid swarm of *M. kamolensis* and *M. rockii,* with approximately 100 individuals (TNC 2007; HBMP 2008; Medieros 2010, in litt.).

Melicope adscendens (alani), a perennial sprawling shrub in the rue family (Rutaceae), is known from Maui (Stone *et al.* 1999, p. 1,183). At the time we designated critical habitat in 2003, there were 16 occurrences (68 FR 25934, May 14, 2003). Currently, *M. adscendens* is known from 2 occurrences totaling 33 individuals within the Auwahi I and Auwahi II fenced exclosures, in the lowland dry and montane mesic ecosystems on east Maui (TNC 2007; HBMP 2008; PEPP 2009, p. 85; Buckman 2010, in litt.).

Melicope balloui (alani), perennial tree or shrub in the rue family (Rutaceae), is known from east Maui (Stone *et al.* 1999, pp. 1,183–1,184). At the time we designated critical habitat in 2003, there were 3 occurrences totaling 50 individuals (68 FR 25934, May 14, 2003). Currently, there are approximately 50 individuals near Palikea Stream in Kipahulu Valley, in the lowland wet ecosystem, and a few individuals at Puuokakae in the montane wet ecosystem (TNC 2007; HBMP 2008; Wood 2009n, in litt.).

Melicope knudsenii (alani), a perennial tree in the rue family (Rutaceae), is known from Kauai and Maui (Stone *et al.* 1999, pp. 1,192–1,193). At the time we designated critical habitat in 2003, there were 10 occurrences on Kauai and 4 occurrences on Maui (68 FR 9116, February 27, 2003; 68 FR 25934, May 14, 2003). Currently, on east Maui, there are two individuals at Auwahi, in the montane dry ecosystem (TNC 2007; HBMP 2008; Oppenheimer 2010b, in litt.).

Melicope mucronulata (alani), a perennial tree in the rue family (Rutaceae), is known from Molokai and east Maui (Stone *et al.* 1999, p. 1,196). At the time we designated critical habitat on Molokai and Maui in 2003, there were two occurrences on Molokai and two occurrences on east Maui (68 FR 12982, March 18, 2003; 68 FR 25934, May 14, 2003). Currently, there are two occurrences on Molokai, one individual at Kupaia Gulch, and three individuals at Onini Gulch, in the lowland mesic ecosystem (TNC 2007; HBMP 2008; PEPP 2008, p. 69; PEPP 2009, p. 86). This species was historically also found in the montane mesic ecosystem on Molokai (TNC 2007; HBMP 2008). The occurrence status of *M. mucronulata* in the lowland dry and montane dry ecosystems on east Maui is unknown.

Melicope munroi (alani), a perennial shrub in the rue family (Rutaceae), is known from Lanai and Molokai (Stone *et al.* 1999, p. 1,196). In 2003, there were two occurrences on Lanai; however, no critical habitat was designated for this species on Lanai or Molokai (68 FR 1220, January 9, 2003; 68 FR 12982, March 18, 2003). Currently, on Lanai, *M. munroi* is known from at least 2 occurrences of fewer than 40 individuals on the Lanaihale summit and the ridge of Waialala Gulch, in the montane wet and wet cliff ecosystems (TNC 2007; HBMP 2008; Oppenheimer 2010t, in litt.). This species has not been seen on Molokai since 1910, where it was last observed in the lowland mesic ecosystem (68 FR 12982, March 18, 2003).

Melicope ovalis (alani), a perennial tree in the rue family (Rutaceae), is known from east Maui (Stone *et al.* 1999, p. 1,198). At the time we designated critical habitat in 2003, there were two occurrences (68 FR 25934, May 14, 2003). Currently, there are approximately 50 individuals in 4 occurrences in the lowland wet ecosystem in Keanae Valley, and in the montane wet and wet cliff ecosystems at Kipahulu Valley and Palikea Stream (TNC 2007; Bily *et al.* 2008 p. 45; HBMP 2008; Oppenheimer 2010b, in litt.; Welton 2010a, in litt.; Wood 2009o, in litt.).

Melicope reflexa (alani), a sprawling shrub in the rue family (Rutaceae), is endemic to east Molokai (Stone *et al.* 1999, p. 1,203). At the time we designated critical habitat in 2003, there were three occurrences (68 FR 12982, March 18, 2003). Currently, there are two occurrences totaling at least six individuals. There are at least 5 individuals at Puuohelo and one individual at Puniuohua in the lowland wet ecosystem (TNC 2007; HBMP 2008; Oppenheimer 2010ee, in litt.). Historically, this species was also found in the lowland mesic and montane wet ecosystems (TNC 2007; HBMP 2008; Oppenheimer 2010u, in litt.; Wood 2010b, in litt.).

Neraudia sericea (NCN), a perennial shrub in the nettle family (Urticaceae), is known from Molokai, Lanai, Maui, and Kahoolawe (Wagner *et al.* 1999cc, p. 1,304). At the time we designated critical habitat in 2003, *N. sericea* was known from Molokai and Maui (68 FR 12982, March 18, 2003; 68 FR 25934, May 14, 2003). Currently, this species is found only on east Maui at Kahikinui, where there are fewer than five individuals in the montane mesic ecosystem. This species has not been observed in the lowland dry ecosystem on east Maui since the early 1900s. Historically, *N. sericea* was found in the lowland dry and dry cliff ecosystems on Lanai, the lowland mesic and montane mesic ecosystems on Molokai, the lowland dry and dry cliff ecosystems on west Maui, and the lowland dry ecosystem on Kahoolawe (TNC 2007; HBMP 2008; Medieros 2010, in litt.).

Nototrichium humile (kului), a trailing shrub in the amaranth family (Amaranthaceae), is known from Oahu and east Maui (Wagner *et al.* 1999dd, pp. 193–194). At the time we designated critical habitat on Maui and Oahu in

2003, *N. humile* was only known from 25 occurrences on Oahu (68 FR 25934, May 14, 2003; 68 FR 35950, June 17, 2003). This species has not been seen on Maui since 1976, when one individual was reported from the lowland dry ecosystem (TNC 2007; HBMP 2008).

Peucedanum sandwicense (makou), a perennial herb in the parsley family (Apiaceae), is known from Kauai, Oahu, Molokai, Maui, and Keopuka islet off the coast of east Maui (Constance and Affolter 1999, p. 208). At the time we designated critical habitat in 2003, *P. sandwicense* was known from 15 occurrences on Kauai, 5 occurrences on Molokai, 3 occurrences on Maui, and 4 occurrences on Oahu (68 FR 9116, February 27, 2003; 68 FR 12982, March 18, 2003; 68 FR 25934, May 14, 2003; 68 FR 35950, June 17, 2003). Currently, *P. sandwicense* is known from 6 occurrences totaling over 45 individuals on Molokai and east Maui. On Molokai, there are 3 occurrences totaling 32 to 37 individuals, at Mokapu islet (25 individuals), Lepau Point (2 individuals), and near the top of the Kalaupapa Trail (5 to 10 individuals), all in the coastal ecosystem. There is a report of an individual found near the lowland wet ecosystem, but this plant has not been relocated since 1989 (TNC 2007; HBMP 2008; NTBG 2010a, in litt.; 2010b, in litt.). On east Maui, *P. sandwicense* occurs on Keopuku islet (15 individuals), Pauwalu Point (an unknown number of individuals), and Honolulu Nui (an unknown number of individuals), in the coastal ecosystem. Historically, this species was found on west Maui in the lowland wet ecosystem (TNC 2007; HBMP 2008; NTBG 2010a, in litt., 2010b, in litt.).

Phyllostegia hispida (NCN), a perennial vine in the mint family (Lamiaceae), is known from Molokai (Wagner *et al.* 1999h, pp. 817–818). Until an individual was rediscovered in 1996, *P. hispida* was thought to be extinct in the wild. This individual died in 1998, and *P. hispida* was thought to be extirpated, until another plant was found in 2005. Propagules were taken and propagated; however, the wild individual died. This sequence of events occurred again in 2006 and 2007 (74 FR 11319, March 17, 2009). At the time we listed *P. hispida* in 2009, no critical habitat was designated for this species on Molokai (74 FR 11319, March 17, 2009). Currently *P. hispida* is known from 4 occurrences totaling 25 individuals in the montane wet and wet cliff ecosystems on Molokai (TNC 2007; PEPP 2009, pp. 7, 15, 90–93). Historically, this species also occurred in the lowland wet ecosystem (TNC 2007; HBMP 2008).

Phyllostegia mannii (NCN), a vine in the mint family (Lamiaceae), is known from Molokai and Maui (Wagner *et al.* 1999h, pp. 820–821). At the time we designated critical habitat on Molokai and Maui in 2003, this species was only known from one individual on east Molokai. It had not been observed on Maui for over 70 years (68 FR 25934, May 14, 2003). Currently, on Molokai, there are three individuals in Hanalilolilo, in the montane wet ecosystem. Historically, *P. mannii* occurred in Molokai's lowland mesic and lowland wet ecosystems, and the montane wet and montane mesic ecosystems on east Maui (TNC 2007; HBMP 2008; Perlman 2009k, in litt.; Oppenheimer 2010u, in litt.; Wood 2010c, in litt.).

Plantago princeps (laukahi kuahiwi), a short-lived shrub or herb in the plantain family (Plantaginaceae), is known from the islands of Kauai, Oahu, Molokai, Maui, and Hawaii (Wagner *et al.* 1999ee, pp. 1,054–1,055). Wagner *et al.* recognize four varieties of *P. princeps: P. princeps* var. *anomala* (Kauai and Oahu), *P. princeps* var. *laxiflora* (Molokai, Maui, and Hawaii), *P. princeps* var. *longibracteata* (Kauai and Oahu), and *P. princeps* var. *princeps* (Oahu) (Wagner *et al.* 1999ee, pp. 1,054–1,055). At the time we designated critical habitat on Kauai, Molokai, Maui, and Oahu in 2003, there was one known occurrence of *P. princeps* var. *laxiflora* on Molokai and eight occurrences on Maui (68 FR 9116, February 27, 2003; 68 FR 12982, March 18, 2003; 68 FR 25934, May 14, 2003; 68 FR 35050, June 17, 2003). Currently, *P. princeps* var. *laxiflora* is known from 6 occurrences totaling approximately 70 individuals on Maui (Oppenheimer 2010a, in litt.). On east Maui, there are 3 occurrences totaling 41 to 46 individuals in the dry cliff and wet cliff ecosystems, at Waikau (1 individual), Kaupo Gap (about 30 individuals), and Palikea (10 to 15 individuals). On west Maui, there are 3 occurrences totaling 15 individuals in the wet cliff ecosystem, on the rim of Kauaula Valley, at the headwaters of Nakalaloa Stream, and in Iao Valley (TNC 2007; HBMP 2008; Oppenheimer 2009g, in litt.). On Molokai, this species was found in the lowland wet and montane mesic ecosystems as recently as 1987 (TNC 2007; HBMP 2008; Oppenheimer 2010u, in litt.).

Platanthera holochila (NCN), a perennial herb in the orchid family (Orchidaceae), is known from Kauai, Oahu, Molokai, and Maui (Wagner *et al.* 1999ff, p. 1,474). At the time we designated critical habitat on Kauai, Maui, and Oahu in 2003, there were two known occurrences on Kauai, one occurrence on Molokai, and six occurrences on Maui (68 FR 9116, February 27, 2003; 68 FR 25934, May 14, 2003). No critical habitat was designated for this species on Molokai in 2003 (68 FR 12982, March 18, 2003). Currently, there are 4 known occurrences totaling 44 individuals on Molokai and west Maui. On Molokai, there is 1 occurrence at Hanalilolilo totaling 24 individuals in the montane wet ecosystem. There are 3 occurrences on west Maui, at Waihee Valley in the wet cliff ecosystem (12 individuals), Waihee Valley in the wet cliff ecosystem (6 individuals), and Pohakea Gulch in the montane wet ecosystem (2 individuals). Historically, this species was also found in the montane wet ecosystem on east Maui (TNC 2007; HBMP 2008; Oppenheimer 2010u, in litt.).

Portulaca sclerocarpa (poe), a perennial herb in the purslane family (Portulacaceae), is known from a single collection from Poopoo islet off the south coast of Lanai, and the island of Hawaii (Wagner *et al.* 1999gg, p. 1,074). At the time we designated critical habitat in 2003, there was 1 known occurrence on Poopoo islet and 24 occurrences on Hawaii Island (68 FR 1220, January 9, 2003; 68 FR 39624, July 2, 2003). Currently, on Lanai, this species is only known from an unknown number of individuals in the coastal ecosystem on Poopoo islet (TNC 2007; HBMP 2008).

Pteris lidgatei (NCN), a terrestrial fern in the maidenhair fern family (Adiantaceae), is known from Oahu, Molokai, and Maui (Palmer 2003, p. 229). At the time we designated critical habitat on Molokai, Maui, and Oahu in 2003, this species was known from two occurrences on Maui and nine occurrences on Oahu (68 FR 12982, March 18, 2003; 68 FR 25934, May 14, 2003; 68 FR 35950, June 17, 2003). Currently, *P. lidgatei* is known from four occurrences totaling over nine individuals on Molokai and Maui. On Molokai, there are six to eight individuals in upper Kumueli Gulch in the montane wet ecosystem. Historically, this species was also found in Molokai's wet cliff ecosystem. On west Maui, *P. lidgatei* is known from a single individual at Kauaula Valley in the wet cliff ecosystem, an unknown number of individuals in both the upper Kauaula Valley in the lowland wet ecosystem and upper Kahakuloa Stream in the wet cliff ecosystem (PEPP 2007, pp. 54–55; TNC 2007; HBMP 2008; PEPP 2009, p. 103; Oppenheimer 2010i, in litt.; 2010u, in litt.).

Remya mauiensis (Maui remya), a perennial shrub in the sunflower family (Asteraceae), is known from west Maui (Wagner *et al.* 1999m, p. 353). At the time we designated critical habitat in 2003, there were five known occurrences totaling 21 individuals (68 FR 25934, May 14, 2003). Currently, *R. mauiensis* is found in 6 occurrences totaling approximately 500 individuals at Kauaula (lowland mesic ecosystem), Puehuehunui (lowland mesic and montane mesic ecosystems), Ukumehame (wet cliff ecosystem), Papalaua (montane mesic ecosystem), Pohakea (lowland dry ecosystem), and Manawainui (lowland dry ecosystem) (TNC 2007; HBMP 2008; Oppenheimer 2010ff, in litt.). Historically, this species also occurred in Maui's lowland wet ecosystem (TNC 2007; HBMP 2008).

Sanicula purpurea (NCN), a perennial herb in the parsley family (Apiaceae), is known from bogs and surrounding wet forest on Oahu and west Maui (Constance and Affolter 1999, p. 210). At the time we designated critical habitat in 2003, this species was known from seven occurrences on west Maui and five occurrences on Oahu (68 FR 25934, May 14, 2003; 68 FR 35950, June 17, 2003). Currently, on west Maui, as many as 50 individuals are found in 4 known occurrences in bogs in the montane wet ecosystem (TNC 2007; HBMP 2008; Oppenheimer 2010gg, in litt.; Perlman 2007d, in litt.; Wood 2010d, in litt.).

Schenkia sebaeoides (awiwi), which is currently listed as *Centaurium sebaeoides* and for which we are proposing a taxonomic revision to *Schenkia sebaeoides* in this rule, is an annual herb in the gentian family (Gentianaceae) known from the islands of Kauai, Oahu, Molokai, Lanai, and west Maui (Wagner *et al.* 1990b, p. 725; 68 FR 1220, January 9, 2003). At the time we designated critical habitat on Kauai, Molokai, Maui, and Oahu in 2003, the species was reported from one occurrence on Lanai, three occurrences on Kauai, two occurrences on Molokai, three occurrences on Maui, and two occurrences on Oahu (68 FR 1220, January 9, 2003; 68 FR 9116, February 27, 2003; 68 FR 12982, March 18, 2003; 68 FR 25934, May 14, 2003; 68 FR 35950, June 17, 2003). No critical habitat was designated for this species on Lanai in 2003 (68 FR 1220, January 9, 2003). Currently, on Lanai, Molokai, and Maui, there are at least eight occurrences, with the highest number of individuals on Molokai. The annual number of individuals on each island varies widely depending upon rainfall (HBMP 2008; Oppenheimer 2009i, in litt.). On Lanai, there is 1 occurrence totaling between 20 and 30 individuals, in the lowland dry ecosystem (TNC 2007; HBMP 2008). On Molokai, there are 2 or more occurrences containing thousands of individuals in the coastal ecosystem (TNC 2007; HBMP 2008). On west Maui, there are 5 occurrences, totaling several thousand individuals, along the north coast from Haewa Point to Puu Kahulanapa, in the coastal ecosystem (Oppenheimer 2010i, in litt.).

Schiedea haleakalensis (NCN), perennial shrub in the pink family (Caryophyllaceae), is known from east Maui (Wagner *et al.* 1999j, pp. 512–514). At the time we designated critical habitat in 2003, this species was known from two occurrences in Haleakala National Park (68 FR 25934, May 14, 2003). Currently, *S. haleakalensis* is found in 2 occurrences totaling fewer than 50 individuals, at Leleiwi Pali and along the cliffs of Kaupo Gap in the subalpine and dry cliff ecosystems, within Haleakala National Park (Welton 2010a, in litt.).

Schiedea lydgatei (NCN), a perennial subshrub in the pink family (Caryophyllaceae), is known from east Molokai (Wagner *et al.* 1999j, p. 516). At the time we designated critical habitat in 2003, this species was known from four occurrences totaling more than 1,000 individuals (68 FR 12982, March 18, 2003). Currently, there are over 200 individuals between Kawela and Makolelau gulches, in the lowland mesic ecosystem (TNC 2007; HBMP 2008; PEPP 2009, p. 109; Oppenheimer 2010u, in litt.).

Schiedea sarmentosa (NCN), a perennial herb in the pink family (Caryophyllaceae), is endemic to Molokai (Wagner *et al.* 2005b, pp. 116–119). At the time we designated critical habitat in 2003, this species was known from five occurrences with an estimated total of over 1,000 individuals (68 FR 12982, March 18, 2003). Currently, *S. sarmentosa* is known from three occurrences from Onini Gulch to Makolelau, with as many as several thousand individuals, in the lowland mesic ecosystem (TNC 2007; HBMP 2008; Oppenheimer 2010hh, in litt.; Perlman 2009l, in litt.; Perlman 2010, in litt.; Wood 2010e, in litt.).

Sesbania tomentosa (ohai), a perennial shrub or small tree in the pea family (Fabaceae), is known from Nihoa and Necker islands in the Northwestern Hawaiian Islands (NWHI) and all of the main Hawaiian Islands (Geesink *et al.* 1999, pp. 704–705). At the time we designated critical habitat in 2003, *S. tomentosa* was known from 1 occurrence on Kauai, 9 occurrences on Molokai, 7 occurrences on Maui, several thousand individuals on Nihoa Island, ''in great abundance'' on Necker Island, 3 occurrences on Oahu, and 31 occurrences on Hawaii Island (68 FR 9116, February 27, 2003; 68 FR 12982, March 18, 2003; 68 FR 25934, May 14, 2003; 68 FR 28054, May 22, 2003; 68 FR 35950, June 17, 2003; 68 FR 39624, July 2, 2003). Currently, *S. tomentosa* is known from Kauai, Molokai, Maui, Kahoolawe, Nihoa and Necker, Oahu, and Hawaii. The number of individuals at any one location varies widely, depending on rainfall (TNC 2007; NTBG 2009k). The estimated number of individuals in the NWHI (Nihoa and Necker) is approximately 5,500 individuals, and in the main Hawaiian Islands 1,600 to 2,000 individuals, totaling as many as 7,500 individuals in 20 occurrences. Currently, on Molokai, Maui, and Kahoolawe, there are approximately 10 known occurrences, totaling between 1,000 and 2,000 individuals. On Molokai, there is one occurrence on the northwest shore from Moomomi to Nenehanaupo, totaling about 35 individuals, and about 1,000 or more individuals on the south coast scattered from Kamiloloa to the Kawela plain, in the coastal and lowland dry ecosystems. Historically, this species also occurred in Molokai's lowland mesic ecosystem (TNC 2007; Cole 2008, in litt.; NTBG 2009k). On west Maui, there are 3 occurrences totaling 80 individuals from Nakalele Point to Mokolea Point, in the coastal ecosystem. Historically, this species also occurred in the lowland dry ecosystem on west Maui (TNC 2007; NTBG 2009k; Oppenheimer 2009h, in litt.). On east Maui, there is one occurrence of 10 individuals in the lowland dry ecosystem (TNC 2007; Cole 2008, in litt.; Oppenheimer 2009h, in litt.; Oppenheimer 2010i, in litt.). On Kahoolawe, about 300 individuals occur in the coastal ecosystem on Puu Koae islet. *Sesbania tomentosa* has not been seen in the coastal and lowland dry ecosystems on Lanai for over 50 years (TNC 2007; HBMP 2008).

Silene alexandri (NCN), a perennial subshrub in the pink family (Caryophyllaceae), is known from Molokai (Wagner *et al.* 1999j, p. 522). At the time we designated critical habitat in 2003, *S. alexandri* was extirpated in the wild, but individuals remained in cultivation (68 FR 12982, March 18, 2003). Currently, *S. alexandri* is known from 1 occurrence of 25 individuals east of Kawela Gulch, in the lowland mesic ecosystem (TNC 2007; HBMP 2008; PEPP 2009, p. 111; Oppenheimer 2010u, in litt.).

Silene lanceolata (NCN), a perennial subshrub in the pink family (Caryophyllaceae), is known from

Kauai, Oahu, Molokai, Lanai, and the island of Hawaii (Wagner *et al.* 1999j, p. 523). At the time we designated critical habitat on Molokai and Oahu in 2003, *S. lanceolata* was known from Molokai, Oahu, and the island of Hawaii (68 FR 12982, March 18, 2003; 68 FR 35950, June 17, 2003; 68 FR 39624, July 2, 2003). However, no critical habitat was designated for this species on Lanai, Kauai, or Hawaii in 2003 (68 FR 1220, January 9, 2003; 68 FR 9116, February 27, 2003; 68 FR 39624, July 2, 2003). Currently, on Molokai, there are 2 occurrences totaling approximately 200 individuals at Kapuaokoolau and along cliffs between Kawela and Makolelau, in the lowland mesic ecosystem (TNC 2007; HBMP 2008; Oppenheimer 2010u, in litt.). This species has not been observed in the lowland dry ecosystem on Lanai since the 1930s (TNC 2007; HBMP 2008).

Solanum incompletum (popolo ku mai), a perennial shrub in the nightshade family (Solanaceae), is reported from Kauai, Molokai, Lanai, Maui, and the island of Hawaii (Symon 1999, pp. 1,270–1,271). At the time we designated critical habitat in 2003, this species was only known from one occurrence on the island of Hawaii (68 FR 39624, July 2, 2003). Currently, there are no known occurrences on Lanai, Molokai, or Maui (HBMP 2008; PEPP 2009, p. 112). Historically, this species occurred in the lowland dry, lowland mesic, and dry cliff ecosystems on Lanai, and in the lowland dry, lowland mesic, and subalpine ecosystems on east Maui. It is unclear when and where this plant was collected on Molokai (TNC 2007; HBMP 2008).

Spermolepis hawaiiensis (NCN), an annual herb in the parsley family (Apiaceae), is known from Kauai, Oahu, Molokai, Lanai, and the island of Hawaii (Constance and Affolter 1999, p. 212). At the time we designated critical habitat on Kauai, Molokai, Maui, and Oahu in 2003, *S. hawaiiensis* was known from 3 occurrences on Lanai, 2 occurrences on Kauai, 1 occurrence on Molokai, 5 occurrences on Maui, 6 occurrences on Oahu, and 30 occurrences on Hawaii Island (68 FR 1220, January 9, 2003; 68 FR 9116, February 27, 2003; 68 FR 12982, March 18, 2003; 68 FR 25934, May 14, 2003; 68 FR 35950, June 17, 2003). No critical habitat was designated for this species on Hawaii in 2003 (68 FR 39624, July 2, 2003). Currently, on Lanai, Molokai, and Maui, there are 9 occurrences totaling a few thousand individuals. On Lanai, there are 3 occurrences at Makiki Ridge, Kahewai Gulch to Puhialelu Ridge, and Kapoho Gulch, totaling between 500 and 600 individuals in the lowland dry and lowland mesic ecosystems. On Molokai, there are thousands of individuals at Makolelau and Kapuaokoolau, in the lowland mesic and montane mesic ecosystems (Perlman 2007e, in litt.; TNC 2007; HBMP 2008; HBMP 2010; Oppenheimer 2010u, in litt.). On east Maui, there is one occurrence at Kanaio, with possibly 1,000 individuals, in the lowland dry ecosystem. On west Maui, there are at least 3 occurrences that may total over 1,000 individuals at Puu Hipa, Olowalu, and Ukumehame in the lowland dry ecosystem. A recent (2010) fire at Olowalu burned at least 50 individuals (TNC 2007; HBMP 2008; Oppenheimer 2010b, in litt. 2010i, in litt.).

Stenogyne bifida (NCN), a climbing perennial herb in the mint family (Lamiaceae), is known from Molokai (Weller and Sakai 1999, p. 835). At the time we designated critical habitat in 2003, there were five known occurrences (68 FR 12982, March 18, 2003). Currently, *S. bifida* is known from one individual on the east fork of Kawela Gulch, in the montane wet ecosystem (TNC 2007; HBMP 2008; PEPP 2009, p. 113; Tangalin 2009, in litt.). The status of the plants in the montane mesic ecosystem, farther west, is unknown (Oppenheimer 2009i, in litt.). Historically, this species was also found in Molokai's lowland mesic, lowland wet, montane mesic, and wet cliff ecosystems (TNC 2007; HBMP 2008).

Tetramolopium capillare (pamakani), a perennial sprawling shrub in the sunflower family (Asteraceae), is known from west Maui (Lowrey 1999, p. 363). At the time we designated critical habitat in 2003, this species was known from five occurrences (68 FR 25934, May 14, 2003). Although *Tetramolopium capillare* was last observed in the wet cliff (Kauaula) and dry cliff (Ukumehame) ecosystems in 2001, and in the lowland dry ecosystem (Ukumehame) in 1995, these plants are no longer extant (TNC 2007; HBMP 2008; Oppenheimer 2010i, in litt.). Currently, there are no known occurrences on west Maui (PEPP 2009, p. 113).

Tetramolopium lepidotum ssp. *lepidotum* (NCN), a perennial shrub in the sunflower family (Asteraceae), is known from Oahu and Lanai (Lowrey 1999, p. 376). At the time we designated critical habitat in 2003, this subspecies was only known from five occurrences on Oahu (68 FR 35950, June 17, 2003). Currently, *T. lepidotum* ssp. *lepidotum* is only found on Oahu. This subspecies was last observed in the lowland dry ecosystem on Lanai in the early 1900s (TNC 2007; HBMP 2008; PEPP 2009, pp. 113–114).

Tetramolopium remyi (NCN), a perennial shrub in the sunflower family (Asteraceae), is known from Lanai and west Maui (Lowrey 1999, pp. 367–368). At the time we designated critical habitat in 2003, there was one occurrence on Lanai totaling approximately 150 individuals, and there were an unknown number of individuals in the Kuia area on west Maui (68 FR 1220, January 9, 2003; 68 FR 25934, May 14, 2003). Currently, there is one known individual on Lanai at Awehi, in the lowland dry ecosystem (TNC 2007; HBMP 2008; Oppenheimer 2010ii, in litt.; Perlman 2008h, in litt.). There are an unknown number of individuals in the Kuia area on west Maui in the lowland dry ecosystem (TNC 2007; HBMP 2008).

Tetramolopium rockii (NCN), a perennial shrub in the sunflower family (Asteraceae), is endemic to the island of Molokai (Lowrey 1999, p. 368). There are two varieties: *T. rockii* var. *calcisabulorum* and *T. rockii* var. *rockii* (Lowrey 1999, p. 368). At the time we designated critical habitat in 2003, *T. rockii* was known from four occurrences totaling thousands of individuals (68 FR 12982, March 18, 2003). *Tetramolopium rockii* var. *calcisabulorum* was reported from Kaiehu Point to Kapalauoa, intergrading with var. *rockii.* *Tetramolopium rockii* var. *rockii* occurred from Kalawao to Kahinaakalani, Kaiehu point to Kapalauoa, and Moomomi to Kahinaakalani. Currently, numbers fluctuate considerably from year to year but remain in the thousands, and occurrences are found along the northwest shore of Molokai, from Kaa Gulch to Kahinaakalani, and on Kalaupapa peninsula from Alau to Makalii, in the coastal ecosystem (Canfield 1990, p. 20; TNC 2007; HBMP 2008; NTBG 2009l; Perlman 2006c, in litt.; Wood 2010f, in litt.).

Vigna o-wahuensis (NCN), a twining perennial herb in the pea family (Fabaceae), is known from all of the main Hawaiian Islands except Kauai (Geesink *et al.* 1999, pp. 720–721). At the time we designated critical habitat on Maui, Oahu, and Hawaii in 2003, *V. o-wahuensis* was known from 6 occurrences totaling approximately 30 individuals on Lanai, Molokai, Maui, and Kahoolawe, and the island of Hawaii (68 FR 1220, January 9, 2003; 68 FR 12982, March 18, 2003; 68 FR 25934, May 14, 2003; 68 FR 39624, July 2, 2003). However, no critical habitat was designated for this species on Lanai or Molokai in 2003 (68 FR 1220, January 9, 2003; 68 FR 12982, March 18, 2003).

Currently, there are 22 individuals in 3 occurrences on Molokai, Maui, and Kahoolawe. On Molokai, 2 occurrences totaling 12 individuals are known from Makakupaia and Makolelau, in the lowland mesic ecosystem. On east Maui, there are approximately 10 individuals at Kanaio Beach in the coastal ecosystem. On Kahoolawe, there is one individual in the lowland dry ecosystem. Historically, *V. o-wahuensis* was found in the lowland dry and lowland mesic ecosystems on Lanai, and in the coastal ecosystem on Kahoolawe (TNC 2007; HBMP 2008; Perlman 2005, in litt.; Wood 2010g, in litt.).

Viola lanaiensis (NCN), a perennial subshrub in the violet family (Violaceae), is known from Lanai (Wagner *et al.* 1999aa, pp. 1,334–1,336). In 2003, there were two known occurrences totaling fewer than 80 individuals; however, no critical habitat was designated for this species on Lanai (68 FR 1220, January 9, 2003). Currently, 6 to11 individuals are found within a fenced exclosure in Awehi Gulch, in the wet cliff ecosystem. Historically, this species was also reported in the montane wet and dry cliff ecosystems (TNC 2007; HBMP 2008; PEPP 2008, p. 84; PEPP 2009, p. 117).

Zanthoxylum hawaiiense (ae), a perennial tree in the rue family (Rutaceae), is known from Kauai, Molokai, Lanai, Maui, and the island of Hawaii (Stone *et al.* 1999, pp. 1,214–1,215). At the time we designated critical habitat on Kauai, Molokai, and Maui in 2003, *Z. hawaiiense* was known from 3 occurrences on Kauai, 5 individuals on Molokai, 9 occurrences on Maui, and 186 occurrences on the island of Hawaii (68 FR 9116, February 27, 2003; 68 FR 12982, March 18, 2003; 68 FR 25934, May 14, 2003; 68 FR 39624, July 2, 2003). No critical habitat was designated for this species on Hawaii in 2003 (68 FR 39624, July 2, 2003). Currently, on Molokai and Maui, this species is known from 5 or 6 occurrences totaling 14 individuals. On Molokai, there are two mature individuals in the lowland wet ecosystem, one individual above Kamalo in the montane wet ecosystem, and one individual in Makolelau Gulch in the lowland mesic ecosystem. On west Maui, there are seven individuals at Puehuehunui in the montane mesic and lowland mesic ecosystems. On east Maui, at Auwahi, there are three individuals in the montane dry and lowland dry ecosystems. Historically, this species also occurred in Maui's subalpine and montane mesic ecosystems (Evans *et al.* 2003, pp. 41, 47; TNC 2007; HBMP 2008; Perlman 2001, in litt.; NTBG 2005; Wood 2007, in litt.; PEPP 2009, pp. 22, 27, 119). *Zanthoxylum hawaiiense* was last seen on Lanai in the lowland wet ecosystem in 1947 (TNC 2007; HBMP 2008).

Status of Two Hawaiian Forest Birds Since Listing

Kiwikiu

The Maui parrotbill, or kiwikiu (*Pseudonestor xanthophrys*), is a small Hawaiian honeycreeper found only on the island of Maui, currently in the mid- to upper-elevation montane mesic and montane wet ecosystems (USFWS 2006, p. 2–79; TNC 2007). The Hawaiian honeycreepers are in the subfamily Drepanidinae of the finch family, Fringillidae (AOU 1998, p. 673). The kiwikiu is most common in wet forests dominated by *Metrosideros polymorpha* trees and a few mesic areas dominated by *M. polymorpha* and *Acacia koa* trees with an intact, dense, diverse native understory and subcanopy of ferns, sedges, epiphytes, shrubs and small to medium trees (USFWS 2006, p. 2–79). In 1980, the number of kiwikiu was estimated by the Hawaii Forest Bird Survey (HFBS) at 500 ± 230 (95 percent confidence interval) birds with an average density of 10 birds per 0.39 sq mi (1 sq km) (Scott *et al.* 1986, p. 115). Currently, the kiwikiu is found only on Haleakala on east Maui, in 12,355 ac (50 sq km) at elevations between 4,000 and 7,700 ft (1,200 to 2,350 m) (USFWS 2006, p. 2–79). The kiwikiu is insectivorous and often feeds in a deliberate manner, using its massive hooked bill to dig, tear, crack, crush, and chisel the bark and softer woods on a variety of native shrubs and small- to medium-sized trees, especially *Rubus hawaiensis* (akala), *Broussaisia arguta* (kanawao), and *M. polymorpha* (USFWS 2006, p. 2–77). Kiwikiu also pluck and bite open fruits, especially *B. arguta* fruits, in search of insects, but do not eat the fruit itself (USFWS 2006, pp. 2–77–2–78). The open cup nest, composed mainly of lichens (*Usnea* sp.) and *Leptecophylla tameiameiae* (pukiawe) twigs, is built by the female an average of 40 ft (12 m) above the ground in a forked branch just under the outer canopy foliage (USFWS 2006, p. 2–78). Based on collections of subfossil bones, the current geographic range is much restricted compared to the known prehistorical range, which included mesic leeward forests and low elevations between 660 and 1,000 ft (200 to 300 m) on east Maui as well as Molokai (James and Olson 1991, p. 80; Olson and James 1991, pp. 14–15; TNC 2007). Surveys from 1995 to 1997 at Hanawi, a study site located in the core of the species' range, showed that the kiwikiu occurred there at approximately the same density (40 birds per 0.39 sq mi (1 sq km)) as in 1980 (Simon *et al.* 2002, p. 477). However, subsequent surveys across the species' range have not conclusively shown that its densities are stable (Camp *et al.* 2009, p. 39).

Akohekohe

The crested honeycreeper, or akohekohe (*Palmeria dolei*), is a small forest bird found only on the island of Maui, currently in the mid- to upper-elevation montane mesic and montane wet ecosystems (USFWS 2006, p. 2–139; TNC 2007). Like the kiwikiu, the akohekohe is also a Hawaiian honeycreeper in the subfamily Drepanidinae of the finch family, Fringillidae (AOU 1998, p. 678). The akohekohe is most common in the wet forest habitat described above for the kiwikiu, except that the lower limit of the akohekohe's elevational range is higher (roughly 5,576 ft (1,700 m)), than the lower limit of the kiwikiu's elevational range (USFWS 2006, p. 2–139). In 1980, the number of akohekohe was estimated by the HFBS at 3,800 ± 700 (95 percent confidence interval) individuals (Scott *et al.* 1986, p. 168). Currently the akohekohe is found only on Haleakala, east Maui, in 14,080 ac (58 sq km) at elevations between 5,000 and 6,900 ft (1,500 to 2,100 m) (USFWS 2006, p. 2–140). The akohekohe is primarily nectarivorous, but also feeds on caterpillars, spiders, and dipterans (flies) (USFWS 2006, p. 2–138). Nectar is primarily sought from flowers of *Metrosideros polymorpha* trees but also from several subcanopy tree and shrub species (USFWS 2006, p. 2–139). The open cup nest is built by the female an average 46 ft (14 m) above the ground in the terminal ends of branches below the canopy foliage of *M. polymorpha* trees (USFWS 2006, p. 2–139). Based on collections of subfossil bones, the current geographic range is much restricted compared to the known prehistorical range, which included dry leeward areas of east and west Maui, and Molokai (Berlin and VanGelder 1999, p. 3). The HFBS and subsequent surveys of the akohekohe range yielded densities of 81 ± 10 birds per 0.39 sq mi (1 sq km) in 1980, 98 ± 11 birds per 0.39 sq mi (1 sq km) from 1992 to 1996, and 116 ± 14 birds per 0.39 sq mi (1 sq km) between 1997 and 2001 (Camp *et al.* 2009, p. 81; Gorresen *et al.* 2009, pp. 123–124). Densities in the core of the species' range within the Hanawi Natural Area Reserve were 183 ± 59 birds per 0.39 sq mi (1 sq km) in 1988,

and 290 ± 10 birds per 0.39 sq mi (1 sq km) from 1995 to 1997 (Berlin and VanGelder 1999, p. 11). These results indicate that the species' rangewide and core densities have both increased and the current population may be larger than previously estimated (Gorresen *et al.* 2009, p. 124).

Methods

As required by section 4(b) of the Act, we used the best scientific data available in determining those areas that contain the physical or biological features essential to the conservation of the 135 species, and for which designation of critical habitat is considered prudent, by identifying the occurrence data for each species and determining the ecosystems upon which they depend. This information was developed by using:

- The known locations of the 135 species, including site-specific species information from the HBMP database (HBMP 2008), the TNC database (TNC 2007), and our own rare plant database;
- Species information from the plant database housed at NTBG;
- Maps of habitat essential to the recovery of Hawaiian plants, as determined by the Hawaii and Pacific Plant Recovery Coordinating Committee (HPPRCC 1998, 32 pp. + appendices);
- Recovery area as determined in the revised Recovery Plan for Hawaiian Forest Birds (USFWS 2006);
- Maps of important habitat for the recovery of plants protected under the Act (USFWS 1999, pp. F8–F11);
- The Nature Conservancy's Ecoregional Assessment of the Hawaiian High Islands (2006) and ecosystem maps (TNC 2007);
- Color mosaic 1:19,000 scale digital aerial photographs for the Hawaiian Islands (April to May 2005);
- Island-wide Geographic Information System (GIS) coverage (e.g., Gap Analysis Program (GAP) vegetation data of 2005);
- 1:24,000 scale digital raster graphics of U.S. Geological Survey (USGS) topographic quadrangles;
- Geospatial data sets associated with parcel data from Maui County (includes Molokai, Lanai, Maui, and Kahoolawe) (2008);
- Final critical habitat designations for *Gouania hillebrandii* and for listed plant species on the islands of Lanai, Molokai, Maui, and Kahoolawe (49 FR 44753, November 9, 1984; 68 FR 1220, January 9, 2003; 68 FR 12982, March 18, 2003; 68 FR 25934, May 14, 2003);
- Recent biological surveys and reports; and
- Discussions with qualified individuals familiar with these species and ecosystems.

Based upon all of this data, we determined that one or more of the 11 ecosystems described in this rule are currently occupied or were occupied at the time of listing by one or more of the 135 species addressed in this rule and contain the physical or biological features essential to the conservation of the species, or are currently not occupied by one or more of the 135 species but are areas and essential for the conservation of the species (coastal (TNC 2006a), lowland dry (TNC 2006b), lowland mesic (TNC 2006c), lowland wet (TNC 2006d), montane wet (TNC 2006e), montane mesic (TNC 2006f), montane dry (TNC 2006g), subalpine (TNC 2006h), alpine (TNC 2006i), dry cliff (TNC 2006j), and wet cliff (TNC 2006k).

Physical or Biological Features

In accordance with section 3(5)(A)(i) and 4(b)(1)(A) of the Act and the regulations at 50 CFR 424.12, in determining which areas within the geographical area occupied at the time of listing to propose as critical habitat, we consider the physical and biological features essential to the conservation of the species and which may require special management considerations or protection. These physical or biological features provide the essential life-history requirements of the species, and include, but are not limited to:

(1) Space for individual and population growth and for normal behavior;

(2) Food, water, air, light, minerals, or other nutritional or physiological requirements;

(3) Cover or shelter;

(4) Sites for breeding, reproduction, rearing (or development) of offspring, germination, or seed dispersal; and

(5) Habitats that are protected from disturbance or are representative of the historical geographical and ecological distributions of a species.

For plant species, ecosystems that provide appropriate seasonal wetland and dry land habitats, host species, pollinators, soil types, and associated plant communities are taken into consideration when determining the physical or biological features essential for a species.

Under section 4(a)(3)(A)(ii) of the Act we may, as appropriate, revise a critical habitat designation. For the reasons described above, we are proposing to revise critical habitat for 85 plants from Molokai, Lanai, Maui, and Kahoolawe, based on new information received since the original designations and the need to designate unoccupied habitat to conserve the species. In addition, the recovery plans (Recovery Plan for *Gouania hillebrandii* (Rhamnaceae), July 1990; Lanai Plant Cluster Recovery Plan, September 1995; Recovery Plan for *Marsilea villosa,* April 1996; Recovery Plan for Molokai Plant Cluster, September 1996; Recovery Plan for the Maui Plant Cluster, July 1997; Molokai II: Addendum to the Recovery Plan for the Molokai Plant Cluster, May 1998; Recovery Plan for the Multi-Island Plants, July 1999; and Addendum to the Recovery Plan for Multi-Island Plants, September 2002) identify several actions needed to recover these species, including: (1) Protecting habitat and controlling threats; (2) expanding existing wild populations; (3) conducting essential research; (4) developing and maintaining monitoring plans; (5) reestablishing wild populations within the historic range; and (6) validating and revising recovery criteria. We have derived the specific physical and biological features required for each of the plant species from studies of the species' habitat, ecology, and life history. In addition, we have reevaluted the physical or biological feature for each of the 85 species based on ecosystem definitions using species information from the 1984 and 2003 critical habitat designations, and new scientific information that has become available since that time.

In 1984 and 2003, the physical or biological features for each plant species were defined on the basis of the habitat features of the areas actually occupied by the plants, which included plant community, associated native plant species, locale information (e.g., steep rocky cliffs, talus slopes, gulches, stream banks), and elevation (49 FR 44753 November 9, 1984; 68 FR 1220, January 9, 2003; 68 FR 12982, March 18, 2003; 68 FR 25934, May 14, 2003). In this proposed rule, we are proposing critical habitat in areas occupied by the species at the time of listing as well as areas currently unoccupied by the species but determined to be essential for their conservation (i.e., areas necessary to bring the species to the point at which the measures provided under the Act are no longer necessary). The physical or biological features have now been more precisely identified for these 85 plant species, and now include elevation, precipitation, substrate, canopy, subcanopy, and understory characteristics. Since 2003, we have found that many areas where these species are currently or recently reported from are marginal habitat and that the species occurs there due to

remoteness or inaccessibility to feral ungulates. Therefore, the 1984 and 2003 critical habitat designations may not have included all of the unoccupied areas that are essential for the conservation of the species.

When designating critical habitat in occupied areas, we focus on the essential physical or biological features that may be essential to the conservation of the species and which may require special management considerations or protections. In unoccupied habitat, we focus on whether the area is essential to the conservation of the species. We have determined that the physical or biological features identified in the original critical habitat designations for these 85 plant species can be improved, based on new information that has become available. The currently proposed physical or biological features for occupied areas, in conjunction with the unoccupied areas needed to expand and reestablish wild populations within their historical range, provide a more accurate picture of the geographic areas needed for the recovery of each species. We believe this information will be helpful to Federal agencies and our other partners, as we collectively work to recover these imperiled species.

Under the Act and its implementing regulations, we are required to identify the physical or biological features essential to the conservation of the 135 species for which we are proposing critical habitat; this includes both new proposed designations and proposed revised designations. We identify these features in areas occupied at the time of listing, focusing on the features' primary constituent elements. We consider the primary constituent elements (PCEs) to be the elements of physical or biological features that provide for a species' life-history processes and are essential to the conservation of the species. The PCEs identified in this proposed rule take into consideration the ecosystems in which each species occurs and reflect a distribution that we believe is essential to achieving the species' recovery needs within those ecosystems.

In this proposal, PCEs for each of the 135 species are defined based on those physical or biological features essential to support the successful functioning of the ecosystem upon which each species depends, and which may require special management considerations or protection. As the conservation of each species is dependent upon a functioning ecosystem to provide its fundamental life requirements, such as a certain soil type, minimum level of rainfall, or suitable native host plant, we consider the physical or biological features present in the ecosystems described in this rule to provide the necessary PCEs for each species in this proposal. The ecosystem's features collectively provide the suite of environmental conditions within each ecosystem essential to meeting the requirements of each species, including the appropriate microclimatic conditions for germination and growth of the plants (e.g., light availability, soil nutrients, hydrologic regime, temperature); maintenance of upland habitat to provide for the proper ecological functioning of forest elements for the three tree snails and the two forest birds; and, in all cases, space within the appropriate habitats for population growth and expansion, as well as to maintain the historical geographical and ecological distribution of each species. In many cases, due to our limited knowledge of the specific life-history requirements for the species that are little-studied and occur in remote and inaccessible areas, the more general description of the physical or biological features that provide for the successful function of the ecosystem that is essential to the conservation of the species represents the best, and in many cases, the only, scientific information available. Accordingly, for purposes of this proposed rule, the physical or biological features of a properly functioning ecosystem are, at least in part, the physical or biological features essential to the conservation of the 135 species at issue here that occur in those ecosystems.

Table 4 identifies the physical or biological features of a functioning ecosystem for each of the ecosystem types identified in this proposed rule, and each species identified in this rule requires the physical or biological features for each ecosystem in which that species occurs, as noted in Table 4. These physical or biological features provide the PCEs for the individual species in each ecosystem. The physical or biological features are defined here by elevation, annual levels of precipitation, substrate type and slope, and the characteristic native plant genera that are found in the canopy, subcanopy, and understory levels of the vegetative community where applicable. If further information is available indicating additional, specific life-history requirements for some species, PCEs relating to these requirements are described separately and are termed ''unique PCEs for species,'' which are also identified in Table 5. The PCEs for each species are therefore composed of the physical or biological features found in its functioning ecosystem(s) in combination with additional unique requirements, if any, as shown in Table 5. Note that the PCEs identified in Table 5 for each species are directly related to the physical or biological features presented in detail in Table 4; thus, both Tables 4 and 5 must be read together to fully describe all of the PCEs for each species.

TABLE 4—PHYSICAL OR BIOLOGICAL FEATURES IN EACH ECOSYSTEM

[Read In association With Table 5]

Ecosystem	Elevation	Annual precipitation	Substrate	One or more of these associated native plant genera		
				Canopy	Subcanopy	Understory
Coastal [1]	<980 ft (< 300 m)	<20 in (<50 cm)	Well-drained, calcareous, talus slopes; weathered clay soils; ephemeral pools; mudflats.	*Hibiscus, Myoporum, Santalum, Scaevola.*	*Gossypium, Sida, Vitex.*	*Eragrostis, Jacquemontia, Lyceum, Nama, Sesuvium, Sporobolus, Vigna.*
Lowland Dry [2]	<3,300 ft (<1,000 m).	<50 in (<130 cm)	Weathered silty loams to stony clay, rocky ledges, little-weathered lava.	*Diospyros, Myoporum, Pleomele, Santalum, Sapindus.*	*Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia.*	*Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Sicyos.*

TABLE 4—PHYSICAL OR BIOLOGICAL FEATURES IN EACH ECOSYSTEM—Continued

[Read In association With Table 5]

Ecosystem	Elevation	Annual precipitation	Substrate	One or more of these associated native plant genera		
				Canopy	Subcanopy	Understory
Lowland Mesic [3]	<3,300 ft (<1,000 m).	50–75 in (130–190 cm).	Shallow soils, little to no herbaceous layer.	*Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*	*Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*	*Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*
Lowland Wet [4] ...	<3,300 ft (<1,000 m).	>75 in (>190 cm)	Clays; ashbeds; deep, well-drained soils; lowland bogs.	*Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*	*Cibotium, Claoxylon, Kadua, Melicope.*	*Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*
Montane Wet [5] ..	3,300–6,500 ft (1,000 –2,000 m).	>75 in (>190 cm)	Well-developed soils, montane bogs.	*Acacia, Charpentiera, Cheirodendron, Metrosideros.*	*Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*	Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*
Montane Mesic [6]	3,300–6,500 ft (1,000–2,000 m).	50–75 in (130–190 cm).	Deep ash deposits, thin silty loams.	*Acacia, Ilex, Metrosideros, Myrsine, Nestegis, Nothocestrum, Pisonia, Pittosporum, Psychotria, Sophora, Zanthoxylum.*	*Alyxia, Charpentiera, Coprosma, Dodonaea, Kadua, Labordia, Leptecophylla, Phyllostegia, Vaccinium.*	Ferns, *Carex, Peperomia.*
Montane Dry [7] ...	3,300–6,500 ft (1,000–2,000 m).	<50 in (<130 cm)	Dry cinder or ash soils, loamy volcanic sands, blocky lava, rock outcroppings.	*Acacia, Metrosideros, Myoporum, Santalum, Sophora.*	*Chamaesyce, Coprosma, Dodonaea, Dubautia, Leptecophylla, Osteomeles, Wikstroemia.*	*Bidens, Eragrostis, Melanthera, Vaccinium.*
Subalpine [8]	6,500–9,800 ft (2,000–3,000 m).	15–40 in (38–100 cm).	Dry ash, sandy loam, rocky undeveloped soils, weathered lava.	*Chamaesyce, Chenopodium, Metrosideros, Myoporum, Santalum, Sophora.*	*Coprosma, Dodonaea, Dubautia, Geranium, Leptecophylla, Vaccinium, Wikstroemia.*	Ferns, *Bidens, Carex, Deschampsia, Eragrostis, Gahnia, Luzula, Panicum, Pseudognaphalium, Sicyos, Tetramolopium.*
Alpine [9]	> 9,800 ft (> 3,000 m).	30–50 in (75–125 cm).	Barren gravel, debris, cinders.	none	*Argyroxiphium, Dubautia, Silene, Tetramolopium.*	None.
Dry Cliff [10]	unrestricted	<75 in (<190 cm)	>65 degree slope, rocky talus.	none	*Antidesma, Chamaesyce, Diospyros, Dodonaea.*	*Bidens, Eragrostis, Melanthera, Schiedea.*
Wet Cliff [11]	unrestricted	>75 in (>190 cm)	>65 degree slope, shallow soils, weathered lava.	none	*Broussaisia, Cheirodendron, Leptecophylla, Metrosideros.*	Bryophytes, Ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

[1] The physical or biological features for the species in the Coastal ecosystem apply to the following units: Maui—Coastal—Units 1–11; Kahoolawe—Coastal—Units 1–3; Lanai—Coastal—Units 1–3; Molokai—Coastal—Units 1–7.

[2] The physical or biological features for the species in the Lowland Dry ecosystem apply to the following units: Maui—Lowland Dry—Units 1–6; Kahoolawe—Lowland Dry—Units 1–2; Lanai—Lowland Dry—Units 1–2; Molokai—Lowland Dry—Units 1–2.

[3] The physical or biological features for the species in the Lowland Mesic ecosystem apply to the following units: Maui—Lowland Mesic—Units 1–3; Lanai—Lowland Mesic—Unit 1; Molokai—Lowland Mesic—Unit 1.

[4] The physical or biological features for the species in the Lowland Wet ecosystem apply to the following units: Maui—Lowland Wet—Units 1–8; Lanai—Lowland Wet—Units 1–2; Molokai—Lowland Wet—Units 1–3.

[5] The physical or biological features for the species in the Montane Wet ecosystem apply to the following units: Maui—Montane Wet—Units 1–8; Lanai—Montane Wet—Unit 1; Molokai—Montane Wet—Units 1–3.

[6] The physical or biological features for the species in the Montane Mesic ecosystem apply to the following units: Maui—Montane Mesic—Units 1–6; Molokai—Montane Mesic—Unit 1.

[7] The physical or biological features for the species in the Montane Dry ecosystem apply to the following units: Maui—Montane Dry—Unit 1.
[8] The physical or biological features for the species in the Subalpine ecosystem apply to the following units: Maui—Subalpine—Units 1–2.
[9] The physical or biological features for the species in the Alpine ecosystem apply to the following units: Maui—Alpine—Unit 1.
[10] The physical or biological features for the species in the Dry Cliff ecosystem apply to the following units: Maui—Dry Cliff—Units 1–7; Lanai—Dry Cliff—Units 1–3.
[11] §The physical or biological features for the species in the Wet Cliff ecosystem apply to the following units: Maui—Wet Cliff—Units 1–8; Lanai—Wet Cliff—Units 1–2; Molokai—Wet Cliff—Units 1–3.

TABLE 5—PRIMARY CONSTITUENT ELEMENTS FOR THE MAUI NUI SPECIES ARE A COMBINATION OF THE PHYSICAL OR BIOLOGICAL FEATURES (SEE TABLE 4) IN THE APPLICABLE ECOSYSTEM(S) AS WELL AS UNIQUE PCES FOR SPECIES, IF ANY ARE IDENTIFIED

	Ecosystem											Species-specific physical or biological features
	Coastal	Lowland dry	Lowland mesic	Lowland wet	Montane wet	Montane mesic	Montane dry	Subalpine	Alpine	Dry cliff	Wet cliff	
Plants												
Abutilon eremitopetalum		LA.										
Acaena exigua					WMA							bogs.
Adenophorus periens					EMA, LA, MO.							epiphytic.
Alectryon macrococcus var. *auwahiensis*		EMA				EMA	EMA.					
Alectryon macrococcus var. *macrococcus*			MO	WMA		EMA, MO					WMA.	
Argyroxiphium sandwicense ssp. *macrocephalum.*						EMA		EMA	EMA			alpine cinder deserts.
Asplenium dielerectum		WMA, LA	WMA, MO	WMA, MO		EMA, MO				LA.		
Asplenium peruvianum var. *insulare*					EMA	EMA		EMA.				
Bidens campylotheca ssp. *pentamera*		WMA	WMA		EMA	EMA				EMA	EMA, WMA.	
Bidens campylotheca ssp. *waihoiensis*				EMA	EMA						EMA	stream banks.
Bidens conjuncta				WMA	WMA						WMA.	
Bidens micrantha ssp. *kalealaha*		EMA, LA	LA	WMA		EMA		EMA		LA.		
Bidens wiebkei	MO			MO	MO	MO.						
Bonamia menziesii		EMA, MO	LA, MO							WMA	WMA.	
Brighamia rockii	EMA, WMA, MO.									LA	MO.	
Calamagrostis hillebrandii					WMA							Bogs.
Canavalia molokaiensis	MO		MO	MO							MO.	
Canavalia pubescens	LA	EMA.										
Cenchrus agrimonioides		EMA, WMA.	LA.									
Clermontia lindseyana						EMA.						
Clermontia oblongifolia ssp. *brevipes*			MO	MO	MO						MO.	
Clermontia oblongifolia ssp. *mauiensis*			LA	EMA, WMA, LA.	EMA.							
Clermontia peleana				EMA								epiphytic.
Clermontia samuelii				EMA	EMA							bog margins.
Colubrina oppositifolia		EMA	WMA.									
Ctenitis squamigera		EMA, WMA.	EMA, WMA, MO.	WMA		WMA				LA	WMA, LA.	
Cyanea asplenifolia			EMA	EMA, WMA.								
Cyanea copelandii ssp. *haleakalalensis*			EMA	EMA	EMA						EMA.	
Cyanea dunbariae			MO	MO		MO.						
Cyanea duvalliorum				EMA	EMA.							
Cyanea gibsonii					LA						LA.	
Cyanea glabra				WMA	EMA	EMA					WMA.	
Cyanea grimesiana ssp. *grimesiana*				MO							MO.	
Cyanea hamatiflora ssp. *hamatiflora*				EMA	EMA	EMA.						
Cyanea horrida					EMA	EMA					EMA.	
Cyanea kunthiana				EMA, WMA.	EMA, WMA.	EMA.						
Cyanea lobata ssp. *baldwinii*					LA.							
Cyanea lobata ssp. *lobata*				WMA							WMA.	
Cyanea magnicalyx				WMA		WMA					WMA.	
Cyanea mannii			MO		MO	MO.						
Cyanea maritae				EMA	EMA.							
Cyanea mceldowneyi				EMA	EMA	EMA.						
Cyanea munroi											MO, LA.	
Cyanea obtusa		WMA				EMA.						
Cyanea procera			MO		MO	MO.						

Cyanea profuga			MO		MO.							
Cyanea solanacea			MO	MO	MO	MO.						
Cyperus fauriei		LA	MO			MO.						
Cyperus pennatiformis	EMA.											
Cyperus trachysanthos		MO LA										seasonally wet soil and pond margins.
Cyrtandra ferripilosa					EMA	EMA.						
Cyrtandra filipes			MO	WMA, MO							WMA.	
Cyrtandra munroi				WMA	LA						WMA, LA.	
Cyrtandra oxybapha					WMA	EMA.						
Diplazium molokaiense			MO, LA	WMA	EMA	EMA, WMA.				EMA, WMA, LA.		
Dubautia plantaginea ssp. *humilis*											WMA.	
Eugenia koolauensis		MO.										
Festuca molokaiensis			MO.									
Flueggea neowawraea		EMA	MO.									
Geranium arboreum						EMA	EMA	EMA.				
Geranium hanaense					EMA							Bogs.
Geranium hillebrandii					WMA	WMA						Bogs.
Geranium multiflorum					EMA	EMA		EMA.				
Gouania hillebrandii		WMA, KAH	MO.									
Gouania vitifolia											WMA.	
Hesperomannia arborescens				WMA	MO						WMA, MO, LA.	
Hesperomannia arbuscula		WMA		WMA						WMA	WMA.	
Hibiscus arnottianus ssp. *immaculatus*	MO										MO.	
Hibiscus brackenridgei	LA, MO	EMA, WMA, LA, KAH.										
Huperzia mannii			EMA	EMA, WMA.	EMA, WMA.	EMA, WMA.						epiphytic.
Ischaemum byrone	EMA, MO.											
Isodendrion pyrifolium			MO	WMA						WMA	WMA.	
Kadua cordata ssp. *remyi*			LA	LA.								
Kadua coriacea		WMA.										
Kadua laxiflora			MO, LA	WMA, LA	LA	MO				WMA	WMA, LA.	
Kanaloa kahoolawensis	KAH	KAH.										
Kokia cookei		MO.										
Labordia tinifolia var. *lanaiensis*			LA	LA	LA						LA.	
Labordia triflora			MO.									
Lysimachia lydgatei		WMA				WMA					WMA.	
Lysimachia maxima				MO	MO.							
Marsilea villosa	MO											seasonal wetland.
Melanthera kamolensis		EMA.										
Melicope adscendens		EMA				EMA.						
Melicope balloui				EMA	EMA.							
Melicope knudsenii							EMA.					
Melicope mucronulata		EMA	MO			MO	EMA.					
Melicope munroi			MO		LA						LA.	
Melicope ovalis				EMA	EMA						EMA.	
Melicope reflexa			MO	MO	MO.							
Mucuna sloanei var. *persericea*				EMA.								
Myrsine vaccinioides					WMA							Bogs.
Neraudia sericea		EMA, WMA, KAH, LA.	MO			EMA, MO				WMA, LA.		
Nototrichium humile		EMA.										
Peperomia subpetiolata					EMA.							
Peucedanum sandwicense	EMA, MO			WMA, MO.								
Phyllostegia bracteata				WMA	EMA, WMA.	EMA		EMA			EMA.	
Phyllostegia haliakalae			MO							LA	EMA, LA.	
Phyllostegia hispida				MO	MO						MO.	

TABLE 5—PRIMARY CONSTITUENT ELEMENTS FOR THE MAUI NUI SPECIES ARE A COMBINATION OF THE PHYSICAL OR BIOLOGICAL FEATURES (SEE TABLE 4) IN THE APPLICABLE ECOSYSTEM(S) AS WELL AS UNIQUE PCES FOR SPECIES, IF ANY ARE IDENTIFIED—Continued

	Ecosystem											Species-specific physical or biological features
	Coastal	Lowland dry	Lowland mesic	Lowland wet	Montane wet	Montane mesic	Montane dry	Subalpine	Alpine	Dry cliff	Wet cliff	
Phyllostegia mannii			MO	MO	EMA, MO	EMA.						
Phyllostegia pilosa			MO		EMA, MO.							
Pittosporum halophilum	MO.											
Plantago princeps				MO		MO				EMA	EMA, WMA.	
Platanthera holochila					EMA, WMA, MO.						WMA.	
Pleomele fernaldii		LA	LA	LA						LA	LA.	
Portulaca sclerocarpa	LA.											
Pteris lidgatei				WMA	MO						WMAMO.	
Remya mauiensis		WMA	WMA	WMA		WMA					WMA.	
Sanicula purpurea					WMA							Bogs.
Santalum haleakalae var. *lanaiense*		EMA, WMA.	WMA, LA, MO.	WMA, LA	LA	EMA, WMA, MO.	EMA				WMA, LA.	
Schenkia sebaeoides	WMA, MO	LA.										
Schiedea haleakalensis								EMA		EMA.		
Schiedea jacobii					EMA.							
Schiedea laui					MO.							
Schiedea lydgatei			MO.									
Schiedea salicaria		WMA.										
Schiedea sarmentosa			MO.									
Sesbania tomentosa	WMA, KAH, LA, MO.	EMA, WMA, KAH, LA, MO.	MO.									
Silene alexandri			MO.									
Silene lanceolata		LA	MO.									
Solanum incompletum		EMA, LA	EMA, LA					EMA		LA.		
Spermolepis hawaiiensis		EMA, WMA, LA.	LA, MO			MO.						
Stenogyne bifida			MO	MO	MO	MO					MO.	
Stenogyne kauaulaensis						WMA.						
Tetramolopium capillare		WMA								WMA	WMA.	
Tetramolopium lepidotum ssp. *lepidotum*		LA.										
Tetramolopium remyi		WMA, LA.										
Tetramolopium rockii	MO.											
Vigna o-wahuensis	EMA, KAH	LA, KAH	LA, MO.									
Viola lanaiensis					LA					LA	LA.	
Wikstroemia villosa				EMA, WMA.	EMA	EMA.						
Zanthoxylum hawaiiense		EMA	WMA, MO	LA, MO	MO	EMA, WMA.	EMA	EMA.				
Birds												
Akohekohe			WMA, MO	EMA, WMA, MO.	EMA, WMA, MO.	EMA, WMA, MO.		EMA		EMA, WMA.	EMA, WMA, MO.	
Kiwikiu			WMA, MO	EMA, WMA, MO.	EMA, WMA, MO.	EMA, WMA, MO.		EMA		EMA, WMA.	EMA, WMA, MO.	
Snails												
Newcombia cumingi (Newcomb's tree snail).				WMA.								
Partulina semicarinata (Lanai tree snail)				LA	LA						LA.	

Partulina variabilis (Lanai tree snail)	.....	.....	.....	.....	LA	LA	.....	.....	.....	.....	.....	LA.

EMA = east Maui
WMA = west Maui
LA = Lanai
MO = Molokai
KAH = Kahoolawe

Some of the species addressed in this proposed rule occur in more than one ecosystem. The PCEs for these species are described separately for each ecosystem in which they occur. The reasoning behind this approach is that each species requires a different suite of environmental conditions depending upon the ecosystem in which it occurs. For example, *Bidens campylotheca* ssp. *pentamera* will occur in association with different native plant species, depending on whether it is found within the lowland dry, lowland mesic, montane wet, montane mesic, dry cliff, or wet cliff ecosystems. Each of the physical or biological features described in each ecosystem in which the species occurs are essential to the conservation of the species, to retain its geographical and ecological distribution across the different ecosystem types in which it may occur. Each physical or biological feature is also essential to retaining the genetic representation that allows this species to successfully adapt to different environmental conditions in various native ecosystems. Although some of these species occur in multiple native ecosystems, their declining abundance in the face of ongoing threats, such as increasing numbers of nonnative plant competitors, indicates that they are not such broad habitat generalists as to be able to persist in highly altered habitats. Based on an analysis of the best available scientific information, functioning native ecosystems provide the fundamental biological requirements for the narrow-range endemics addressed in this proposed rule.

Some examples may help to clarify our approach to describing the PCEs for each individual species. If we want to determine the PCEs for the plant *Abutilon eremitopetalum,* we look at Table 5 and see that the PCEs for *A. eremitopetalum* are provided by the physical or biological features in the lowland dry ecosystem. Table 4 indicates that the physical or biological features in the lowland dry ecosystem include elevations of less than 3,300 ft (1,000 m); annual precipitation of less than 50 in (130 cm); weathered silty loams to stony clay, rocky ledges, and little-weathered lava; and potential habitat for one or more genera of the subcanopy and understory plants *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola,* and *Wikstroemia,* and one or more of the genera of the canopy species *Diospyros, Myoporum, Pleomele, Santalum,* and *Sapindus.* As we do not specifically know the unique PCEs for *A. eremitopetalum* and this plant is found only in the lowland dry ecosystem, we believe that the physical or biological features for the lowland dry ecosystem best approximate the PCEs for *A. eremitopetalum.* Thus we use the physical and biological features provided in the ecosystem in which *A. eremitopetalum* is found as the PCEs for *A. eremitopetalum.*

As another example, Table 4 indicates the physical or biological features for the plant *Geranium hillebrandii* include the ecosystem-level physical or biological features for the montane wet and montane mesic ecosystems, depending on the locations, and also that this species has a species-specific PCE: bogs. The PCEs for *G. hillebrandii* are thus composed of the physical or biological features for each of the two ecosystems it occupies, as described in Table 4 for the montane wet and montane mesic ecosystems, as well as bogs. Table 5 is read in a similar fashion in conjunction with Table 4 to describe the PCEs for each of the 135 species for which we are proposing to designate critical habitat in this proposed rule.

Criteria Used to Identify Critical Habitat Boundaries

We considered several factors in the selection and proposal of specific boundaries for critical habitat for these 135 species. We propose to designate critical habitat on lands that contain the physical or biological features essential to conserving multiple species, based on their shared dependence on the functioning ecosystems they have in common. Because the 11 ecosystem types addressed in this proposed rule do not form a single contiguous area, they are divided into geographic units: 100 plant critical habitat units, 88 forest bird critical habitat units, and 11 tree snail critical habitat units on the islands of Molokai, Lanai, Maui, and Kahoolawe. The 88 forest bird and 10 of the 11 tree snail critical habitat units completely overlap the 100 plant critical habitat units. The critical habitat unit designated for Newcomb's snail on west Maui only partially overlaps Maui—Lowland Wet—2.

The proposed critical habitat is a combination of areas currently occupied by the species in that ecosystem, as well as areas that may be currently unoccupied. Due to the extremely remote and inaccessible nature of the area, surveys are relatively infrequent and may be limited in scope; therefore, it is difficult to say with certainty whether individual representatives of a rare species may or may not be present. However, the best available scientific information suggests that these species either currently occupy these areas or have occupied these areas in the past. A properly functioning ecosystem provides the life-history requirements of the species that make up that ecosystem, and the physical or biological features found in such an ecosystem are the PCEs essential for the conservation of the species that occur there. In other words, the occupied areas provide the physical or biological features essential to the conservation of the species occurring in the ecosystems we analyzed, by providing for the successful functioning of the ecosystem on which the species depend. However, due to the small population sizes, few numbers of individuals, and reduced geographic range of each of the 135 species for which critical habitat is here proposed, we have determined that a designation limited to the known present range of each species would be inadequate to achieve the conservation of those species. The areas believed to be unoccupied, and that may have been unoccupied at the time of listing, have been determined to be essential for the conservation and recovery of the species because they provide the physical or biological features necessary for the expansion of existing wild populations and reestablishment of wild populations within the historical range of the species. For 17 of the plant species (*Acaena exigua, Clermontia peleana, Cyanea glabra, C. grimesiana* ssp. *grimesiana, Cyperus trachysanthos, Eugenia koolauensis, Gouania vitifolia, Isodendrion pyrifolium, Kadua coriacea, Kokia cookei, Nototrichium humile, Phyllostegia bracteata, P. haliakalae, Schiedea jacobii, Solanum incompletum, Tetramolopium capillare,* and *T. lepidotum* ssp. *lepidotum*), we are proposing to designate unoccupied areas only, as these species are not believed to be extant on Molokai, Lanai, Maui, or Kahoolawe. Designating unoccupied critical habitat for these species would promote conservation actions to restore their historical, geographical and ecological representation, which is essential for their recovery. Critical habitat boundaries for all species were delineated to include the functioning ecosystems on which they depend.

In some cases, we have identified areas of critical habitat for species in multiple ecosystem areas. With the exception of *Acaena exigua, Clermontia peleana, Cyanea glabra, C. grimesiana* ssp. *grimesiana, Cyperus trachysanthos, Eugenia koolauensis, Gouania vitifolia, Isodendrion pyrifolium, Kadua coriacea, Kokia cookei, Nototrichium humile, Phyllostegia bracteata, P. haliakalae, Schiedea jacobii, Solanum incompletum, Tetramolopium capillare,*

and *T. lepidotum* ssp. *Lepidotum,* which are believed to be no longer extant on Molokai, Lanai, Maui, or Kahoolawe, all of the critical habitat units in these ecosystems contain some areas that are currently unoccupied, and that may have been unoccupied at the time of listing, but have been determined to be essential for the conservation of the species. Because of the small numbers of individuals or low population sizes of each of the 135 species, each requires suitable habitat and space for the expansion of existing populations to achieve a level that could approach recovery. For example, although the plant *Huperzia mannii* is found in multiple critical habitat units across four ecosystem types, its entire distribution is comprised of a total of fewer than 100 individuals. The unoccupied areas of each unit are essential for the expansion of this species to achieve viable population numbers and maintain its historical geographical and ecological distribution.

On Maui, there are two distinct geographic areas (east and west Maui) separated by an isthmus. Sixty-three of the plant species and the tree snail *Newcombia cumingi,* for which we are proposing critical habitat, are historically known from only east or west Maui. Thirty-seven plant species (*Adenophorus periens, Alectryon macrococcus* var. *auwahiensis, Argyroxiphium sandwicense* ssp. *macrocephalum, Asplenium peruvianum* var. *insulare, Bidens campylotheca* ssp. *waihoiensis, Clermontia lindseyana, C. peleana, C. samuellii, Cyanea copelandii* ssp. *haleakalaensis, C. duvalliorum, C. hamatiflora* ssp. *hamatiflora, C. horrida, C. kunthiana, C. maritae, C. mceldowneyi, Cyperus pennatiformis, Cyrtandra ferripilosa, Flueggea neowawraea, Geranium arboreum, G. multiflorum, Ischaemum byrone, Melanthera kamolensis, Melicope adscendens, M. balloui, M. knudsenii, M. mucronulata, M. ovalis, Mucuna sloanei* var. *persericea, Nototrichium humile, Peperomia subpetiolata, Phyllostegia haliakalae, P. mannii, P. pilosa, Schiedea haleakalensis, S. jacobii, Solanum incompletum,* and *Vigna o-wahuensis*) are known only from the east Maui mountains and 26 plant species (*Acaena exigua, Bidens conjuncta, Calamagrostis hillebrandii, Centaurium sebaeoides, Cyanea lobata* ssp. *lobata, C. magnicalyx, Cyrtandra filipes, C. munroi, Dubautia plantaginea* ssp. *humilis, Geranium hillebrandii, Gouania hillebrandii, G. vitifolia, Hesperomannia arborescens, H. arbuscula, Isodendrion pyrifolium, Kadua coriacea, K. laxiflora, Lysimachia lydgatei, Myrsine vaccinioides, Pteris lydgatei, Remyi mauiensis, Sanicula purpurea, Schiedea salicaria, Stenogyne kauaulaensis, Tetramolopium capillare,* and *T. remyi*), and the tree snail *Newcombia cumingi,* are known only from the west Maui mountains. For these species, we propose critical habitat in ecosystems only in the geographic area of historical occurrence.

Current and historical species location information was used to develop initial critical habitat boundaries in each of the 11 ecosystems that would individually and collectively provide for the conservation of the 135 species addressed in this proposed rule. The initial boundaries were superimposed over digital topographic maps of the islands of Molokai, Lanai, Maui, and Kahoolawe and further evaluated. In general, land areas that were identified as highly degraded were removed from the proposed critical habitat units, and natural or manmade features (e.g., ridge lines, valleys, streams, coastlines, roads, obvious land features, etc.) were used to delineate the proposed critical habitat boundaries.

The critical habitat areas described below constitute our best assessment of the physical or biological features essential for the recovery and conservation of the 135 species, and the unoccupied areas needed for the expansion of reduced populations. The approximate size of each of the 100 plant critical habitat units, the 88 forest bird critical habitat units, and the 11 tree snail critical habitat units, and the status of their land ownership, are identified in Tables 6A through 6H. The ecosystems in which critical habitat for each of the plant, forest bird, and tree snail species is proposed are identified in Tables 7A through 7C, along with areas under consideration for exclusion from critical habitat designation under section 4(b)(2) of the Act (see Exclusions, below). All forest bird and tree snail proposed critical habitat units overlap areas also proposed for designation as plant critical habitat.

When determining critical habitat boundaries within this proposed rule, we made every effort to avoid including developed areas such as buildings, paved areas, and other structures that lack the physical or biological features essential for the conservation of the 135 species. The scale of the maps we prepared under the parameters for publication within the Code of Federal Regulations may not reflect the exclusion of such developed areas. Any such structures and the land under them inadvertently left inside critical habitat boundaries shown on the maps of this proposed rule have been excluded by text in the proposed rule and are not proposed for designation as critical habitat. Therefore, Federal actions involving these areas would not trigger section 7 consultation with respect to critical habitat unless the specific action would affect the adjacent critical habitat or its primary constituent elements.

TABLE 6A—CRITICAL HABITAT PROPOSED FOR 60 PLANT SPECIES ON THE ISLAND OF MOLOKAI

[Totals may not sum due to rounding]

Proposed critical habitat area	Size of unit in acres	Size of unit in hectares	Landownership (acres)			
			State	Federal	County	Private
Molokai—Coastal						
—Unit 1	250	101	0	54	0	195
—Unit 2	3,544	1,434	1,032	0	0	2,511
—Unit 3	862	349	859	3	0	<1
—Unit 4	10	4	10	0	0	0
—Unit 5	1	0.5	1	0	0	0
—Unit 6	1,913	774	202	0	0	1,711
—Unit 7	306	124	3	0	0	303
Total Coastal	6,886	2,786	2,106	57	0	4,720
Molokai—Lowland Dry						
—Unit 1	70	28	0	0	0	70

TABLE 6A—CRITICAL HABITAT PROPOSED FOR 60 PLANT SPECIES ON THE ISLAND OF MOLOKAI—Continued

[Totals may not sum due to rounding]

Proposed critical habitat area	Size of unit in acres	Size of unit in hectares	Landownership (acres)			
			State	Federal	County	Private
—Unit 2	3,201	1,295	945	0	0	2,255
Total Lowland Dry	3,271	1,323	945	0	0	2,325
Molokai—Lowland Mesic						
—Unit 1	10,330	4,180	3,538	0	0	6,792
Total Lowland Mesic	10,330	4,180	3,538	0	0	6,792
Molokai—Lowland Wet						
—Unit 1	3,628	1,468	2,195	0	0	1,433
—Unit 2	1,952	790	1,356	0	0	597
—Unit 3	8,074	3,267	1,128	0	0	6,945
Total Lowland Wet	13,654	5,525	4,679	0	0	8,975
Molokai—Montane Wet						
—Unit 1	4,818	1,950	1,518	0	0	3,300
—Unit 2	910	368	871	0	0	39
—Unit 3	803	325	77	0	0	726
Total Montane Wet	6,531	2,643	2,466	0	0	4,065
Molokai—Montane Mesic						
—Unit 1	1,629	659	257	0	0	1,373
Total Montane Mesic	1,629	659	257	0	0	1,373
Molokai—Wet Cliff						
—Unit 1	1,888	764	1,399	0	0	489
—Unit 2	1,280	518	462	0	0	818
—Unit 3	1,362	551	1,137	0	0	225
Total Wet Cliff	4,530	1,833	2,998	0	0	1,532
Total All Units	46,831	18,949	16,922	57	0	29,782

TABLE 6B—CRITICAL HABITAT PROPOSED FOR 38 PLANT SPECIES ON THE ISLAND OF LANAI

[Totals may not sum due to rounding]

Proposed critical habitat area	Size of unit in acres	Size of unit in hectares	Landownership (acres)			
			State	Federal	County	Private
Lanai—Coastal:						
—Unit 1	373	151	0	0	0	373
—Unit 2	2	1	2	0	0	0
—Unit 3	509	206	0	0	0	509
Total Coastal	886	359	2	0	0	883
Lanai—Lowland Dry:						
—Unit 1	9,766	3,952	0	0	0	9,766
—Unit 2	939	380	0	0	0	939
Total Lowland Dry	10,705	4,332	0	0	0	10,705
Lanai—Lowland Mesic:						
—Unit 1	11,172	4,521	0	0	3	11,170
Total Lowland Mesic	11,172	4,521	0	0	3	11,170
Lanai—Lowland Wet:						
—Unit 1	374	152	0	0	0	374
—Unit 2	232	94	0	0	0	232
Total Lowland Wet	606	245	0	0	0	606
Lanai—Montane Wet:						

TABLE 6B—CRITICAL HABITAT PROPOSED FOR 38 PLANT SPECIES ON THE ISLAND OF LANAI—Continued

[Totals may not sum due to rounding]

Proposed critical habitat area	Size of unit in acres	Size of unit in hectares	Landownership (acres)			
			State	Federal	County	Private
—Unit 1	248	101	0	0	0	248
Total Montane Wet	248	101	0	0	0	248
Lanai—Dry Cliff:						
—Unit 1	83	34	0	0	0	83
—Unit 2	354	143	0	0	0	354
—Unit 3	398	161	0	0	0	398
Total Dry Cliff	835	338	0	0	0	835
Lanai—Wet Cliff:						
—Unit 1	731	296	0	0	0	731
—Unit 2	230	93	0	0	0	230
Total Wet Cliff	961	389	0	0	0	961
Total All Units	25,413	10,285	0	0	2	25,408

TABLE 6C—CRITICAL HABITAT PROPOSED FOR 91 PLANT SPECIES ON THE ISLAND OF MAUI

[Totals may not sum due to rounding]

Proposed critical habitat area	Size of unit in acres	Size of unit in hectares	Landownership (acres)			
			State	Federal	County	Private
Maui—Coastal:						
—Unit 1	2	1	2	0	0	0
—Unit 2	68	28	42	0	0	26
—Unit 3	54	22	13	0	0	40
—Unit 4	243	98	107	0	0	136
—Unit 5	27	11	27	0	0	0
—Unit 6	357	144	357	0	0	0
—Unit 7	187	76	40	0	0	147
—Unit 8	597	242	597	0	0	<1
—Unit 9	393	159	184	0	5	205
—Unit 10	434	176	215	0	0	219
—Unit 11	6	3	6	0	0	0
Total Coastal	2,368	960	1,590	0	5	773
Maui—Lowland Dry:						
—Unit 1	22,196	8,983	12,999	0	0	9,197
—Unit 2	2,612	1,057	1,851	0	0	762
—Unit 3	1,089	441	0	0	<1	1,089
—Unit 4	1,283	519	1,283	0	0	0
—Unit 5	5,448	2,205	3,685	0	0	1,763
—Unit 6	579	234	4	0	0	575
Total Lowland Dry	33,207	13,439	19,822	0	1	13,386
Maui—Lowland Mesic:						
—Unit 1	1,930	781	1,172	502	0	256
—Unit 2	3,424	1,386	1,315	0	0	2,109
—Unit 3	477	193	477	0	0	0
Total Lowland Mesic	5,831	2,360	2,964	502	0	2,365
Maui—Lowland Wet:						
—Unit 1	26,703	10,807	10,822	2,038	0	13,844
—Unit 2	5,066	2,050	65	0	0	5,001
—Unit 3	1,427	577	1,247	0	0	180
—Unit 4	1,165	472	864	0	301	0
—Unit 5	2,112	855	30	0	0	2,082
—Unit 6	639	259	136	0	0	503
—Unit 7	898	364	898	0	0	0
—Unit 8	230	93	230	0	0	0

TABLE 6C—CRITICAL HABITAT PROPOSED FOR 91 PLANT SPECIES ON THE ISLAND OF MAUI—Continued

[Totals may not sum due to rounding]

Proposed critical habitat area	Size of unit in acres	Size of unit in hectares	Landownership (acres)			
			State	Federal	County	Private
Total Lowland Wet	38,240	15,477	14,292	2,038	301	21,610
Maui—Montane Wet:						
—Unit 1	7,815	3,162	1,067	0	0	6,747
—Unit 2	16,687	6,753	4,075	875	0	11,737
—Unit 3	2,228	902	0	2,228	0	0
—Unit 4	1,833	742	180	1,653	0	0
—Unit 5	387	156	222	165	0	0
—Unit 6	3,964	1,604	1,113	0	471	2,380
—Unit 7	608	246	80	0	0	528
—Unit 8	46	19	0	0	0	46
Total Montane Wet	33,568	13,584	6,737	4,921	471	21,438
Maui—Montane Mesic:						
—Unit 1	20,972	8,487	7,277	2,897	18	10,781
—Unit 2	366	148	124	0	0	242
—Unit 3	218	88	174	0	0	44
—Unit 4	72	29	72	0	0	0
—Unit 5	304	123	170	0	0	134
—Unit 6	94	38	0	0	0	94
Total Montane Mesic	22,026	8,913	7,817	2,897	18	11,295
Maui—Montane Dry:						
—Unit 1	4,988	2,019	2,962	323	0	1,703
Total Montane Dry	4,988	2,019	2,962	323	0	1,703
Maui—Subalpine:						
—Unit 1	19,401	7,851	10,866	2,770	0	5,764
—Unit 2	10,931	4,424	0	9,836	0	1,095
Total Subalpine	30,332	12,275	10,866	12,606	0	6,859
Maui—Alpine:						
—Unit 1	2,107	853	761	918	0	428
Total Alpine	2,107	853	761	918	0	428
Maui—Dry Cliff:						
—Unit 1	1,018	412	0	755	0	264
—Unit 2	688	279	0	688	0	0
—Unit 3	293	119	0	200	0	93
—Unit 4	315	127	0	315	0	0
—Unit 5	1,536	622	1,298	0	0	238
—Unit 6	279	113	279	0	0	0
—Unit 7	808	327	0	0	0	808
Total Dry Cliff	4,937	1,999	1,577	1,958	0	1,403
Maui—Wet Cliff:						
—Unit 1	460	186	0	0	0	460
—Unit 2	1,407	569	475	912	0	20
—Unit 3	438	177	5	433	0	0
—Unit 4	184	75	184	0	0	0
—Unit 5	2,048	829	35	0	0	2,013
—Unit 6	9,103	3,684	1,858	0	2,917	4,328
—Unit 7	781	316	557	0	0	224
—Unit 8	337	137	337	0	0	0
Total Wet Cliff	14,758	5,973	3,451	1,345	2,917	7,045
Total All Units	192,362	77,852	72,839	27,508	3,713	88,305

TABLE 6D—CRITICAL HABITAT PROPOSED FOR SIX PLANT SPECIES ON THE ISLAND OF KAHOOLAWE

[Totals may not sum due to rounding]

Proposed critical habitat area	Size of unit in acres	Size of unit in hectares	Landownership (acres)			
			State	Federal	County	Private
Kahoolawe—coastal:						
—Unit 1	1,515	613	1,515	0	0	0
—Unit 2	12	5	12	0	0	0
—Unit 3	339	137	339	0	0	0
Total Coastal	1,866	755	1,866	0	0	0
Kahoolawe—Lowland Dry:						
—Unit 1	1,380	559	1,380	0	0	0
—Unit 2	3,205	1,297	3,205	0	0	0
Total Lowland Dry	4,585	1,856	4,585	0	0	0
Total All Units	6,451	2,611	6,451	0	0	0

TABLE 6E—CRITICAL HABITAT PROPOSED FOR TWO FOREST BIRD SPECIES (AKOHEKOHE AND KIWIKIU) ON THE ISLAND OF MAUI

[Totals may not sum due to rounding]

Proposed critical habitat area	Size of unit in acres	Size of unit in hectares	Landownership (acres)			
			State	Federal	County	Private
Lowland Mesic:						
Maui—Unit 1	477	193	477	0	0	0
Total Lowland Mesic	477	193	477	0	0	0
Lowland Wet:						
Maui—Unit 2	26,703	10,807	10,822	2,038	0	13,844
Maui—Unit 3	5,066	2,050	65	0	0	5,001
Maui—Unit 4	1,427	577	1,247	0	0	180
Maui—Unit 5	1,165	472	864	0	301	0
Maui—Unit 6	2,112	855	30	0	0	2,082
Maui—Unit 7	639	259	136	0	0	503
Maui—Unit 8	898	364	898	0	0	0
Maui—Unit 9	230	93	230	0	0	0
Total Lowland Wet	38,240	15,477	14,292	2,038	301	21,610
Montane Wet:						
Maui—Unit 10	7,815	3,162	1,067	0	0	6,747
Maui—Unit 11	16,687	6,753	4,075	875	0	11,737
Maui—Unit 12	2,228	902	0	2,228	0	0
Maui—Unit 13	1,833	742	180	1,653	0	0
Maui—Unit 14	387	156	222	165	0	0
Maui—Unit 15	3,964	1,604	1,113	0	471	2,380
Maui—Unit 16	608	246	80	0	0	528
Maui—Unit 17	46	19	0	0	0	46
Total Montane Wet	33,568	13,584	6,737	4,921	471	21,438
Montane Mesic:						
Maui—Unit 18	20,972	8,487	7,277	2,897	18	10,781
Maui—Unit 19	366	148	124	0	0	242
Maui—Unit 20	218	88	174	0	0	44
Maui—Unit 21	72	29	72	0	0	0
Maui—Unit 22	304	123	170	0	0	134
Maui—Unit 23	94	38	0	0	0	94
Total Montane Mesic	22,026	8,913	7,817	2,897	18	11,295
Subalpine:						
Maui—Unit 24	19,401	7,851	10,866	2,770	0	5,764
Maui—Unit 25	10,931	4,424	0	9,836	0	1,095
Total Subalpine	30,332	12,275	10,866	12,606	0	6,859
Dry Cliff:						

TABLE 6E—CRITICAL HABITAT PROPOSED FOR TWO FOREST BIRD SPECIES (AKOHEKOHE AND KIWIKIU) ON THE ISLAND OF MAUI—Continued

[Totals may not sum due to rounding]

Proposed critical habitat area	Size of unit in acres	Size of unit in hectares	Landownership (acres)			
			State	Federal	County	Private
Maui—Unit 26	1,018	412	0	755	0	264
Maui—Unit 27	293	119	0	200	0	93
Maui—Unit 28	315	127	0	315	0	0
Maui—Unit 29	1,536	622	1,298	0	0	238
Total Dry Cliff	3,162	1,280	1,298	1,270	0	595
Wet Cliff:						
Maui—Unit 30	460	186	0	0	0	460
Maui—Unit 31	1,407	569	475	912	0	20
Maui—Unit 32	438	177	5	433	0	0
Maui—Unit 33	184	75	184	0	0	0
Maui—Unit 34	2,048	829	35	0	0	2,013
Maui—Unit 35	9,103	3,684	1,858	0	2,917	4,328
Maui—Unit 36	781	316	557	0	0	224
Total Wet Cliff	14,421	5,836	3,114	1,345	2,917	7,045
Total All Units	142,226	57,558	44,601	25,077	3,707	68,842

TABLE 6F—CRITICAL HABITAT PROPOSED FOR TWO FOREST BIRD SPECIES (AKOHEKOHE AND KIWIKIU) ON THE ISLAND OF MOLOKAI

[Totals may not sum due to rounding]

Proposed critical habitat area	Size of unit in acres	Size of unit in hectares	Landownership (acres)			
			State	Federal	County	Private
Lowland Mesic						
Molokai—Unit 37	10,330	4,180	3,538	0	0	6,792
Total Lowland Mesic	10,330	4,180	3,538	0	0	6,792
Lowland Wet						
Molokai—Unit 38	3,628	1,468	2,195	0	0	1,433
Molokai—Unit 39	1,952	790	1,356	0	0	597
Total Lowland Wet	5,580	2,258	3,551	0	0	2,030
Montane Wet						
Molokai—Unit 40	4,818	1,950	1,518	0	0	3,300
Molokai—Unit 41	910	368	871	0	0	39
Total Montane Wet	5,728	2,318	2,389	0	0	3,339
Montane Mesic						
Molokai—Unit 42	1,629	659	257	0	0	1,373
Total Montane Mesic	1,629	659	257	0	0	1,373
Wet Cliff						
Molokai—Unit 43	1,888	764	1,399	0	0	489
Molokai—Unit 44	1,280	518	462	0	0	818
Total Wet Cliff	3,168	1,282	1,861	0	0	1,307
Total All Units	26,435	10,697	11,596	0	0	14,841

TABLE 6G—CRITICAL HABITAT PROPOSED FOR TWO LANAI TREE SNAIL SPECIES (PARTULINA SEMICARINATA AND P. VARIABILIS) ON THE ISLAND OF LANAI

[Totals may not sum due to rounding]

Proposed critical habitat area	Size of unit in acres	Size of unit in hectares	Landownership (acres)			
			State	Federal	County	Private
Lowland Wet						
Lanai—Unit 1	374	152	0	0	0	374
Lanai—Unit 2	232	94	0	0	0	232
Total Lowland Wet	606	246	0	0	0	606
Montane Wet						
Lanai—Unit 3	248	101	0	0	0	248
Total Montane Wet	248	101	0	0	0	248
Wet Cliff						
Lanai—Unit 4	731	296	0	0	0	731
Lanai—Unit 5	230	93	0	0	0	230
Total Wet Cliff	961	389	0	0	0	961
Total All Units	1,815	736	0	0	0	1,815

TABLE 6H—CRITICAL HABITAT PROPOSED FOR NEWCOMBIA CUMINGI ON THE ISLAND OF MAUI

[Totals may not sum due to rounding]

Proposed critical habitat area	Size of unit in acres	Size of unit in hectares	Landownership (acres)			
			State	Federal	County	Private
Lowland Wet						
Maui—Unit 1	599	242	56	0	0	542
Total Lowland Wet	599	242	56	0	0	542
Total All Units	599	242	56	0	0	542

TABLE 7A—PLANT SPECIES FOR WHICH CRITICAL HABITAT IS PROPOSED FOR DESIGNATION IN EACH ECOSYSTEM, AND AREAS UNDER CONSIDERATION FOR EXCLUSION UNDER SECTION 4(B)(2) OF THE ACT

Species	Ecosystem											Considered for exclusion from critical habitat ac (ha)	Total critical habitat proposed (inclusive of areas considered for exclusion) ac (ha)
	Coastal	Lowland dry	Lowland mesic	Lowland wet	Montane wet	Montane mesic	Montane dry	Subalpine	Alpine	Dry cliff	Wet cliff		
Plants:													
Abutilon eremitopetalum		LA										0 (0)	10,705 (4,332)
Acaena exigua *					WMA							1,364 (552)	4,618 (1,869)
Adenophorus periens					EMA, LA, MO.							9,463 (3,828)	35,729 (14,459)
Alectryon macrococcus var. *auwahiensis.*		EMA				EMA	EMA					14,575 (5,899)	51,857 (20,987)
Alectryon macrococcus var. *macrococcus.*			MO	WMA		EMA, MO					WMA	16,054 (6,498)	56,737 (22,962)
Argyroxiphium sandwicense ssp. *macrocephalum.*						EMA		EMA	EMA			10,151 (4,108)	53,411 (21,615)
Asplenium dielerectum		WMA, LA	WMA, MO	WMA, MO		EMA, MO				LA		14,641 (5,926)	80,873 (32,728)
Asplenium peruvianum var. *insulare.*					EMA	EMA		EMA				18,180 (7,356)	80,254 (32,477)
Bidens campylotheca ssp. *pentamera.*		WMA	WMA		EMA	EMA				EMA	EMA, WMA.	18,551 (7,507)	78,205 (31,648)
Bidens campylotheca ssp. *waihoiensis.*				EMA	EMA						EMA	9,016 (3,648)	58,142 (23,529)
Bidens conjuncta				WMA	WMA						WMA	9,264 (3,750)	28,424 (11,505)
Bidens micrantha ssp. *kalealaha.*		EMA, LA	LA	WMA		EMA		EMA		LA		22,690 (9,183)	111,450 (45,104)
Bidens wiebkei	MO			MO	MO	MO						3,156 (1,277)	28,700 (111,613)
Bonamia menziesii		EMA, MO	LA, MO							WMA	WMA	9,482 (3,838)	66,562 (26,533)
Brighamia rockii	MO, EMA, WMA.									LA	MO	1,141 (462)	14,619 (5,917)
Calamagrostis hillebrandii					WMA							1,364 (552)	4,618 (1,869)
Canavalia molokaiensis	MO		MO	MO							MO	1,324 (536)	35,400 (14,324)
Canavalia pubescens	LA	EMA										6,874 (2,782)	26,783 (10,840)
Cenchrus agrimonioides		EMA, WMA.	LA									6,874 (2,782)	44,379 (17,960)
Clermontia lindseyana						EMA						6,953 (2,814)	20,972 (8,487)
Clermontia oblongifolia ssp. *brevipes.*			MO	MO	MO						MO	1,819 (736)	3,515 (142.348)
Clermontia oblongifolia ssp. *mauiensis.*			LA	EMA, WMA, LA.	EMA							14,526 (5,878)	78,968 (31,958)
Clermontia peleana *				EMA								802 (325)	26,703 (10,807)
Clermontia samuelii				EMA	EMA							8,846 (3,579)	55,653 (22,522)
Colubrina oppositifolia		EMA	WMA									7,681 (3,109)	29,798 (12,060)

Ctenitis squamigera		EMA, WMA.	EMA, WMA, MO.	WMA		WMA				LA	WMA, LA	15,969 (6,464)	76,025 (30,768)
Cyanea asplenifolia			EMA	EMA, WMA.								6,482 (2,624)	40,170 (16,258)
Cyanea copelandii ssp. *haleakalaensis.*			EMA	EMA	EMA						EMA	9,016 (3,648)	60,072 (24,310)
Cyanea dunbariae			MO	MO		MO						1,201 (486)	25,613 (10,364)
Cyanea duvalliorum				EMA	EMA							8,846 (3,579)	55,653 (22,522)
Cyanea gibsonii					LA						LA	0 (0)	1,209 (490)
Cyanea glabra *				WMA	EMA	EMA					WMA	22,897 (9,266)	61,459 (24,872)
Cyanea grimesiana ssp. *grimesiana* *.				MO							MO	12 (5)	18,184 (7,358)
Cyanea hamatiflora ssp. *hamatiflora.*				EMA	EMA	EMA						15,799 (6,393)	76,625 (31,009)
Cyanea horrida					EMA	EMA					EMA	15,167 (6,137)	52,411 (21,209)
Cyanea kunthiana				EMA, WMA.	EMA, WMA.	EMA						22,843 (9,244)	92,780 (37,548)
Cyanea lobata ssp. *baldwinii*					LA							0 (0)	248 (101)
Cyanea lobata ssp. *lobata*				WMA							WMA	7,900 (3,198)	23,806 (9,636)
Cyanea magnicalyx				WMA		WMA					WMA	7,900 (3,198)	24,861 (10,062)
Cyanea mannii			MO		MO	MO						1,819 (736)	18,490 (7,482)
Cyanea maritae				EMA	EMA							8,846 (3,579)	55,653 (22,522)
Cyanea mceldowneyi				EMA	EMA	EMA						15,799 (6,393)	76,625 (31,009)
Cyanea munroi											MO, LA	12 (5)	5,491 (2,222)
Cyanea obtusa		WMA				EMA						6,953 (2,814)	28,282 (11,445)
Cyanea procera			MO		MO	MO						1,819 (736)	18,490 (7,482)
Cyanea profuga			MO		MO							1,807 731)	16,861 (6,823)
Cyanea solanacea			MO	MO	MO	MO						1,819 (736)	32,144 (13,007)
Cyperus fauriei		LA	MO			MO						400 (162)	22,664 (9,171)
Cyperus pennatiformis	EMA											0 (0)	1,535 (622)
Cyperus trachysanthos *		LA, MO										0 (0)	13,976 (5,655)
Cyrtandra ferripilosa					EMA	EMA						14,997 (6,068)	49,922 (20,202)
Cyrtandra filipes			MO	WMA, MO							WMA	8,288 (3,355)	47,790 (19,341)
Cyrtandra munroi				WMA	LA						WMA, LA	7,900 (3,198)	25,015 (10,126)
Cyrtandra oxybapha					WMA	EMA						8,317 (3,366)	25,590 (10,356)
Diplazium molokaiense			LA, MO	WMA	EMA	EMA, WMA.				EMA, WMA, LA.		21,422 (8,668)	99,609 (40,310)
Dubautia plantaginea ssp. *humilis.*											WMA	2,220 (899)	12,269 (4,966)
Eugenia koolauensis *		MO										0 (0)	3,271 (1,323)
Festuca molokaiensis			MO									388 (157)	10,330 (4,180)

TABLE 7A—PLANT SPECIES FOR WHICH CRITICAL HABITAT IS PROPOSED FOR DESIGNATION IN EACH ECOSYSTEM, AND AREAS UNDER CONSIDERATION FOR EXCLUSION UNDER SECTION 4(B)(2) OF THE ACT—Continued

Species	Ecosystem											Considered for exclusion from critical habitat ac (ha)	Total critical habitat proposed (inclusive of areas considered for exclusion) ac (ha)
	Coastal	Lowland dry	Lowland mesic	Lowland wet	Montane wet	Montane mesic	Montane dry	Subalpine	Alpine	Dry cliff	Wet cliff		
Flueggea neowawraea		EMA	MO									7,262 (2,939)	36,227 (14,661)
Geranium arboreum						EMA	EMA	EMA				10,884 (4,405)	56,292 (22,781)
Geranium hanaense					EMA							8,044 (3,255)	28,950 (11,715)
Geranium hillebrandii					WMA	WMA						1,364 (552)	5,673 (2,295)
Geranium multiflorum					EMA	EMA		EMA				18,180 (7,356)	80,254 (32,477)
Gouania hillebrandii		WMA, KAH	MO									388 (157)	22,225 (8,994)
Gouania vitifolia *											WMA	2,220 (899)	12,269 (4,966)
Hesperomannia arborescens				WMA	MO						WMA, LA, MO.	9,331 (3,777)	35,828 (14,501)
Hesperomannia arbuscula		WMA		WMA						WMA	WMA	7,900 (3,198)	33,739 (13,656)
Hibiscus arnottianus ssp. *immaculatus.*	MO										MO	936 (379)	11,416 (4,619)
Hibiscus brackenridgei	LA, MO	EMA, WMA, LA, MO, KAH.										7,798 (3,156)	59,540 (24,095)
Huperzia mannii			EMA	EMA, WMA.	EMA, WMA.	EMA, WMA.						22,843 (9,244)	95,765 (38,755)
Ischaemum byrone	EMA, MO											924 (374)	8,421 (3,408)
Isodendrion pyrifolium *			MO	WMA						WMA	WMA	8,288 (3,355)	36,759 (14,878)
Kadua cordata ssp. *remyi*			LA	LA								0 (0)	11,778 (4,766)
Kadua coriacea *		WMA										0 (0)	7,310 (2,958)
Kadua laxiflora			LA, MO	WMA, LA	LA	MO				WMA	WMA, LA	9,101 (3,684)	51,375 (20,793)
Kanaloa kahoolawensis	KAH	KAH										0 (0)	6,451 (2,611)
Kokia cookei *		MO										0 (0)	3,271 (1,323)
Labordia tinifolia var. *lanaiensis.*			LA	LA	LA						LA	0 (0)	12,987 (5,256)
Labordia triflora			MO									388 (157)	10,330 (4,180)
Lysimachia lydgatei		WMA				WMA					WMA	2,220 (899)	20,634 (8,350)
Lysimachia maxima				MO	MO							1,419 (574)	20,185 (8,168)
Marsilea villosa	MO											924 (374)	6,886 (2,786)
Melanthera kamolensis		EMA										6,874 (2,782)	25,897 (10,487)
Melicope adscendens		EMA				EMA						13,827 (5,596)	46,869 (18,968)

Melicope balloui				EMA	EMA							8,846 (3,579)	55,653 (22,522)
Melicope knudsenii							EMA					748 (303)	4,988 (2,019)
Melicope mucronulata		EMA	MO			MO	EMA					8,823 (3,571)	42,844 (17,339)
Melicope munroi			MO		LA						LA	388 (157)	11,539 (4,670)
Melicope ovalis				EMA	EMA						EMA	9,016 (3,648)	58,142 (23,529)
Melicope reflexa			MO	MO	MO							1,807 (731)	30,515 (12,348)
Mucuna sloanei var. *persericea.*				EMA								802 (325)	26,703 (10,807)
Myrsine vaccinioides					WMA							1,364 (552)	4,618 (1,869)
Neraudia sericea		EMA, WMA, LA, KAH.	MO			EMA, MO				WMA, LA		15,028 (6,082)	84,886 (34,353)
Nototrichium humile *		EMA										6,874 (2,782)	25,897 (10,481)
Peperomia subpetiolata					EMA							8,044 (3,255)	28,950 (11,715)
Peucedanum sandwicense	EMA, MO			WMA, MO								6,604 (2,673)	33,612 (13,603)
Phyllostegia bracteata *				WMA	EMA, WMA.	EMA		EMA			EMA	25,394 (10,276)	98,898 (40,023)
Phyllostegia haliakalae *			MO							LA	EMA, LA	558 (226)	14,615 (5,914)
Phyllostegia hispida				MO	MO						MO	1,431 (579)	21,391 (8,656)
Phyllostegia mannii			MO	MO	EMA, MO	EMA						16,804 (6,799)	80,437 (32,550)
Phyllostegia pilosa			MO		EMA, MO							9,851 (3,985)	45,811 (18,538)
Pittosporum halophilum	MO											924 (374)	6,886 (2,786)
Plantago princeps				MO		MO				EMA	EMA, WMA.	3,560 (1,442)	32,355 (13,093)
Platanthera holochila					EMA, WMA, MO.						WMA	13,047 (5,279)	52,368 (21,193)
Pleomele fernaldii		LA	LA	LA						LA	LA	0 (0)	24,279 (9,825)
Portulaca sclerocarpa	LA											0 (0)	886 (359)
Pteris lidgatei				WMA	MO						WMA, MO	9,331 (3,777)	34,867 (14,112)
Remya mauiensis		WMA	WMA	WMA		WMA					WMA	8,707 (3,524)	36,072 (14,599)
Sanicula purpurea					WMA							1,364 (552)	4,618 (1,869)
Santalum haleakalae var. *lanaiense.*		EMA, WMA.	WMA, LA, MO.	WMA, LA	LA	EMA, WMA, MO.	EMA				WMA, LA	24,483 (9,909)	112,875 (45,681)
Schenkia sebaeoides	WMA, MO	LA										1,129 (457)	18,424 (7,456)
Schiedea haleakalensis								EMA		EMA		3,540 (1,434)	32,646 (13,211)
Schiedea jacobii *					EMA							8,044 (3,254)	28,950 (11,715)
Schiedea laui					MO							1,419 (574)	6,531 (2,643)
Schiedea lydgatei			MO									388 (157)	10,330 (4,180)
Schiedea salicaria		WMA										0 (0)	7,310 (2,958)

TABLE 7A—PLANT SPECIES FOR WHICH CRITICAL HABITAT IS PROPOSED FOR DESIGNATION IN EACH ECOSYSTEM, AND AREAS UNDER CONSIDERATION FOR EXCLUSION UNDER SECTION 4(B)(2) OF THE ACT—Continued

Species	Ecosystem											Considered for exclusion from critical habitat ac (ha)	Total critical habitat proposed (inclusive of areas considered for exclusion) ac (ha)
	Coastal	Lowland dry	Lowland mesic	Lowland wet	Montane wet	Montane mesic	Montane dry	Subalpine	Alpine	Dry cliff	Wet cliff		
Schiedea sarmentosa	.....	.....	MO	.....	.....	.....	.....	.....	.....	.....	.....	388 (157)	10,330 (4,180)
Sesbania tomentosa	WMA, MO, LA, KAH.	EMA, WMA, LA, MO, KAH.	MO	.....	.....	.....	.....	.....	.....	.....	.....	8,391 (3,396)	72,569 (29,368)
Silene alexandri	.....	.....	MO	.....	.....	.....	.....	.....	.....	.....	.....	388 (157)	10,330 (4,180)
Silene lanceolata	.....	LA	MO	.....	.....	.....	.....	.....	.....	.....	.....	388 (157)	21,035 (8,512)
Solanum incompletum *	.....	EMA, LA	EMA, LA	.....	.....	.....	.....	EMA	.....	LA	.....	10,057 (4,070)	80,871 (32,728)
Spermolepis hawaiiensis	.....	EMA, WMA, LA.	LA, MO	.....	.....	MO	.....	.....	.....	.....	.....	8,075 (3,268)	67,043 (25,131)
Stenogyne bifida	.....	.....	MO	MO	MO	MO	.....	.....	.....	.....	MO	2,632 (1,065)	36,674 (14,840)
Stenogyne kauaulaensis	.....	.....	.....	.....	.....	WMA	.....	.....	.....	.....	.....	0 (0)	1,055 (426)
Tetramolopium capillare *	.....	WMA	.....	.....	.....	.....	.....	.....	.....	WMA	WMA	2,220 (899)	22,202 (8,986)
Tetramolopium lepidotum ssp. *lepidotum* *.	.....	LA	.....	.....	.....	.....	.....	.....	.....	.....	.....	0 (0)	10,705 (4,332)
Tetramolopium remyi	.....	WMA, LA	.....	.....	.....	.....	.....	.....	.....	.....	.....	0 (0)	18,015 (7,290)
Tetramolopium rockii	MO	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	924 (374)	6,886 (2,786)
Vigna o-wahuensis	EMA, KAH	LA, KAH	MO, LA	.....	.....	.....	.....	.....	.....	.....	.....	388 (157)	40,193 (16,266)
Viola lanaiensis	.....	.....	.....	.....	LA	.....	.....	.....	.....	LA	LA	0 (0)	2,044 (828)
Wikstroemia villosa	.....	.....	.....	EMA, WMA.	EMA	EMA	.....	.....	.....	.....	.....	21,479 (8,692)	59,528 (24,090)
Zanthoxylum hawaiiense	.....	EMA	WMA, MO	LA, MO	MO	EMA, WMA.	EMA	EMA	.....	.....	.....	20,372 (8,244)	118,266 (47,860)
Areas Considered for Exclusion by Ecosystem, ac (ha).	1,129 (457)	6,874 (2,782).	1,195 (484)	6,482 (2,623).	10,827 (4,380).	7,766 (3,143).	748 (303)	3,183 (1,288).	15 (6)	357 (144)	2,402 (973)	.....	.....
Total Area Proposed CH (including areas considered for exclusion).	12,006 (4,860).	51,768 (20,950).	27,333 (11,061).	52,500 (21,247).	40,347 (16,328).	23,656 (9,572).	4,988 (2,019).	30,332 (12,275).	2,107 (853)	5,772 (2,336).	20,249 (8,195).	.....	.....

EMA = critical habitat within indicated ecosystem in the east Maui mountains.
WMA = critical habitat within indicated ecosystem in the west Maui mountains.
LA = critical habitat within indicated ecosystem on Lanai.
MO = critical habitat within indicated ecosystem on Molokai.
KAH = critical habitat within indicated ecosystem on Kahoolawe.
The area known to be occupied by species for which the unit is designated also provides area essential to the conservation of all of the species that occur in that particular ecosystem, even if the area is currently unoccupied by those species. Those areas provide the space and appropriate environmental conditions for activities such as seed dispersal and reproduction that will serve to expand the existing populations.
* This species may no longer occur in the wild on Molokai, Lanai, Maui, or Kahoolawe.

TABLE 7B—FOREST BIRD SPECIES FOR WHICH CRITICAL HABITAT IS DESIGNATED IN EACH ECOSYSTEM, AND AREAS CONSIDERED FOR EXCLUSION UNDER SECTION 4(B)(2)

Species	Ecosystem											Considered for exclusion from critical habitat ac (ha)	Total critical habitat proposed ac (ha)
	Coastal	Lowland dry	Lowland mesic	Lowland wet	Montane wet	Montane mesic	Montane dry	Sub-alpine	Alpine	Dry cliff	Wet cliff		
Forest Bird:													
Akohekohe	.....	.....	WMA, MO	EMA, WMA, MO.	EMA, WMA, MO.	EMA, WMA, MO.	.....	EMA	.....	EMA, WMA.	EMA, WMA, MO.	31,405 (12,710)	168,663 (67,632)
Kiwikiu	.....	.....	WMA, MO	EMA, WMA, MO.	EMA, WMA, MO.	EMA, WMA, MO.	.....	EMA	.....	EMA, WMA.	EMA, WMA, MO.	31,405 (12,710)	168,663 (67,632)
Area Considered for Exclusion ac (ha).	.....	.....	388 (157)	6,482 (2,624).	10,827 (4,380).	7,766 (3,143).	.....	3,813 (1,288).	.....	357 (145)	2,402 (973)	.....	.....
Total Area Proposed Critical Habitat (including area considered for exclusion) ac (ha).	.....	.....	10,807 (4,373).	43,820 (17,735).	39,297 (15,902).	23,656 (9,572).	.....	30,332 (12,275).	.....	3,162 (1,279).	17,589 (7,118).	.....	.....

EMA = critical habitat within indicated ecosystem in the east Maui mountains.
WMA = critical habitat within indicated ecosystem in the west Maui mountains.
MO = critical habitat within indicated ecosystem on Molokai.
The area known to be occupied by species for which the unit is designated also provides area essential to the conservation of all of the species that occur in that particular ecosystem, even if the area is currently unoccupied by those species. Those areas provide the space and appropriate environmental conditions for activities such as food gathering and reproduction that will serve to expand the existing populations.

TABLE 7C—TREE SNAIL SPECIES FOR WHICH CRITICAL HABITAT IS DESIGNATED IN EACH ECOSYSTEM AND AREAS CONSIDERED FOR EXCLUSION UNDER 4(B)(2) FOREST BIRD SPECIES FOR WHICH CRITICAL HABITAT IS DESIGNATED IN EACH ECOSYSTEM, AND AREAS CONSIDERED FOR EXCLUSION UNDER SECTION 4(B)(2)

Species	Ecosystem											Considered for exclusion from critical habitat ac (ha)	Total critical habitat proposed ac (ha)
	Coastal	Lowland dry	Lowland mesic	Lowland wet	Montane wet	Montane mesic	Montane dry	Sub-alpine	Alpine	Dry cliff	Wet cliff		
Tree Snail:													
Newcombia cumingi	.....	.....	.....	WMA	.....	.....	.....	.....	.....	.....	.....	0 (0)	599 (242)
Area Considered for Exclusion ac (ha).	.....	.....	.....	0 (0)	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total Proposed CH ac (ha)	.....	.....	.....	599 (242)	.....	.....	.....	.....	.....	.....	.....	.....	.....
Partulina semicarinata	.....	.....	.....	LA	LA	.....	.....	.....	.....	.....	LA	0 (0)	1,815 (736)
Partulina variabilis	.....	.....	.....	LA	LA	.....	.....	.....	.....	.....	LA	0 (0)	1,815 (736)
Area Considered for Exclusion ac (ha).	.....	.....	.....	0 (0)	0 (0)	.....	.....	.....	.....	.....	0 (0)	.....	.....
Total Area Proposed CH (including area considered for exclusion) ac (ha).	.....	.....	.....	606 (246)	248 (101)	.....	.....	.....	.....	.....	961 (389)	.....	.....

WMA = critical habitat within indicated ecosystem in the west Maui mountains.
LA = critical habitat within indicated ecosystem on Lanai.
The area known to be occupied by species for which the unit is designated also provides area essential to the conservation of all of the species that occur in that particular ecosystem, even if the area is currently unoccupied by those species. Those areas provide the space and appropriate environmental conditions for activities such as food gathering and reproduction that will serve to expand the existing populations.

Special Management Considerations or Protections

The term critical habitat is defined in section 3(5)(A) of the Act, in part, as geographic areas on which are found these physical or biological features essential to the conservation of the species and ''which may require special management considerations or protection.''

In identifying critical habitat in occupied areas, we determine whether those areas that contain the features essential to the conservation of the species require any special management actions. Although the determination that special management may be required is not a prerequisite to designating critical habitat in unoccupied areas, special management is needed throughout all of the proposed critical habitat units. The following discussion of special management needs is therefore applicable to each of the 135 Maui Nui species for which we are herein proposing to designate critical habitat.

The 135 species for which we are proposing to designate critical habitat include 118 species that are currently found in the wild on Molokai, Lanai, Maui, and Kahoolawe, 10 plant species which were historically found on one or more of these islands, but are currently found only on other Hawaiian Islands (*Clermontia peleana, Cyanea grimesiana* ssp. *grimesiana, Cyperus trachysanthos, Eugenia koolauensis, Gouania vitifolia, Isodendrion pyrifolium, Kadua coriacea, Nototrichium humile, Solanum incompletum,* and *Tetramolopium lepidotum* ssp. *lepidotum*), 6 plant species that may not be currently extant in the wild (*Acaena exigua, Cyanea glabra, Phyllostegia bracteata, P. haliakalae, Schiedea jacobii,* and *Tetramolopium capillare*), and 1 plant species, *Kokia cookei,* which exists only in cultivation. For each of the 118 species currently found in the wild on Molokai, Lanai, Maui, and Kahoolawe, we have determined that the features essential to their conservation are those required for the successful functioning of the ecosystem(s) in which they occur (see Tables 4 and 5, above). As described earlier, in some cases, additional species-specific primary constituent elements were also identified (see Table 5, above). Special management considerations or protections are necessary throughout the critical habitat areas proposed here to avoid further degradation or destruction of the habitat that provides those features essential to their conservation. The primary threats to the physical or biological features essential to the conservation of all of these species include habitat destruction and modification by nonnative ungulates, competition with nonnative species, hurricanes, landslides, rockfalls, flooding, fire, drought, and climate change. The three tree snails are additionally threatened by predation by the rosy wolf snail. The reduction of these threats will require the implementation of special management actions within each of the critical habitat areas identified in this proposed rule.

All proposed critical habitat requires active management to address the ongoing degradation and loss of native habitat caused by nonnative ungulates (pigs, goats, mouflon sheep, axis deer, and cattle). Nonnative ungulates also impact the habitat through predation and trampling. Without this special management, habitat containing the features that are essential for the conservation of these species will continue to be degraded and destroyed.

All proposed critical habitat requires active management to address the ongoing degradation and loss of native habitat caused by nonnative plants. Special management is also required to prevent the introduction of new nonnative plant species into native habitats. Particular attention is required in nonnative plant control efforts to avoid creating additional disturbances that may facilitate the further introduction and establishment of invasive plant seeds. Precautions are also required to avoid the inadvertent trampling of listed plant species in the course of management activities.

The active control of nonnative plant species will help to address the threat posed by fire to 39 of the proposed ecosystem critical habitat units in particular: Maui—Coastal—Units 4 through 7; Maui—Lowland Dry—Units 1 through 6; Maui—Lowland Mesic—Units 1 and 2; Maui—Montane Mesic—Units 1, 2, and 5; Maui—Dry Cliff—Units 1, 5, and 7; Kahoolawe—Coastal—Units 1 through 3; Kahoolawe—Lowland Dry—Units 1 and 2; Lanai—Coastal—Units 1 and 3; Lanai—Lowland Dry—Units 1 and 2; Lanai—Lowland Mesic—Unit 1; Lanai—Dry Cliff—Units 1 through 3; Molokai—Coastal—Units 1, 2, 3, 6, and 7; Molokai—Lowland Dry—Units 1 and 2; and Molokai—Lowland Mesic—Unit 1. This threat is largely a result of the presence of nonnative plant species such as the grasses *Andropogon virginicus* and *Melinis minutiflora* that increase the fuel load and quickly regenerate after a fire. These nonnative grass species can outcompete native plants that are not adapted to fire, creating a grass-fire cycle that alters ecosystem functions (D'Antonio and Vitousek 1992, pp. 64—66; Brooks *et al.* 2004, p. 680).

Nine of the ecosystem critical habitat units (Maui—Lowland Wet—Units 1 and 4; Maui—Montane Wet—Units 1 through 3; Maui—Montane Mesic—Unit 2; Maui—Wet Cliff—Units 6 and 7; and Molokai—Montane Wet—Unit 1) may require special management to reduce the threat of landslides, rockfalls, and flooding. These threaten to further degrade habitat conditions in these units and have the potential to eliminate some occurrences of 50 plant species (e.g., *Adenophorus periens, Alectryon macrococcus, Asplenium peruvianum* var. *insulare, Bidens campylotheca* ssp. *pentamera, B. campylotheca* ssp. *waihoiensis, B. conjuncta, B. wiebkei, Bonamia menziesii, Clermontia oblongifolia* ssp. *brevipes, C. oblongifolia* ssp. *mauiensis, C. samuelii, Ctenitis squamigera, Cyanea asplenifolia, C. copelandii* ssp. *haleakalaensis, C. duvalliorum, C. hamatiflora* ssp. *hamatiflora, C. horrida, C. kunthiana, C. magnicalyx, C. mannii, C. maritae, C. mceldowneyi, C. profuga, C. solanaea, Cyrtandra filipes, C. munroi, Diplazium molokaiense, Dubautia plantaginea* ssp. *humilis, Geranium hanaense, G. multiflorum, Hesperomannia arborescens, Huperzia mannii, Kadua laxiflora, Lysimachia lydgatei, L. maxima, Melicope balloui, M. ovalis, Phyllostegia hispida, P. mannii, P. pilosa, Plantago princeps, Platanthera holochila, Pteris lidgatei, Remya mauiensis, Santalum haleakalae* var. *lanaiense, Schiedea laui, Stenogyne bifida, S. kauaulaensis, Wikstroemia villosa,* and *Zanthoxylum hawaiiense*) found on steep slopes and cliffs, or in narrow gulches.

In summary, we find that each of the areas we are proposing as critical habitat contains features essential for the conservation of the species that may require special management considerations or protection to ensure the conservation of the 135 species for which we are proposing critical habitat. These special management considerations and protections are required to preserve and maintain the essential features provided to these species by the ecosystems upon which they depend. The specific areas proposed for critical habitat that are outside the geographical area occupied by these species have been determined to be essential for their conservation.

Proposed Critical Habitat Designation

We are proposing 271,062 ac (109,695 ha) as critical habitat in 11 ecosystem types for 135 species. The proposed

critical habitat is comprised of 100 critical habitat units for the plants, 44 critical habitat units for each of the 2 forest birds, 5 critical habitat units for each of the Lanai tree snails, and one critical habitat unit for the Maui tree snail *Newcombia cumingi* (see Tables 6A–6H, above, for details). The proposed critical habitat includes land under State, County of Maui, Federal (Haleakala National Park; Kalaupapa National Historical Park (NHP), Department of Homeland Security—Coast Guard), and private ownership. The critical habitat units we describe below constitute our current best assessment of those areas that meet the definition of critical habitat for the 135 species of plants and animals.

Descriptions of Proposed Critical Habitat Units

Critical habitat designations for the 130 plant species, the 2 forest birds, and the 3 tree snails would be published in separate sections of the Code of Federal Regulations (CFR); critical habitat would be published in 50 CFR 17.99(c), (d), (e)(1), (e)(2), (f), (m), and (n) for plants on Molokai, Maui and Kahoolawe, and Lanai; in 50 CFR 17.95(b) for the two forest birds; and in 50 CFR 17.95(f) for the three tree snail species. However, the proposed critical habitat for plants, birds, and tree snails overlap each other in many areas of Molokai, Maui, and Lanai. For example, ''Lanai—Lowland Wet—Unit 1'' and the Lanai tree snail unit ''*Partulina variabilis*—Unit 1—Lowland Wet'' correspond to the same geographic area. Therefore, because the unit boundaries are the same, we are describing them only once to avoid redundancy and reduce publication costs for this proposed rule, as indicated by ''(and)'' following the unit name.

As provided under section 4(b)(2) of the Act, all or portions of each of these areas may be considered for exclusion from critical habitat when this rule is finalized. Exclusions are considered based on the relative benefits of including or excluding an area from critical habitat, and includes the consideration of information provided during the public comment period on potential economic or other impacts of this proposed critical habitat designation. Exclusions from critical habitat may be made at the discretion of the Secretary (as described below, under ''Exclusions''). The consideration of potential economic impacts or other relevant impacts of critical habitat applies solely to the designation of critical habitat, and is not a factor in our assessment of whether a species warrants listing as endangered or threatened under the Act.

Maui—Coastal—Unit 1 consists of 2 ac (1 ha) on Keopuka Rock on the northern coast of east Maui. This unit is State-owned, and is classified as a State Seabird Sanctuary. It is occupied by the plants *Ischaemum byrone* and *Peucedanum sandwicense,* and includes the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the coastal ecosystem (see Table 4). This unit also contains unoccupied habitat that is essential to the conservation of these species by providing the PCEs necessary for the expansion of the existing wild populations. Although Maui—Coastal—Unit 1 is not known to be occupied by *Brighamia rockii, Cyperus pennatiformis,* or *Vigna o-wahuensis,* we have determined this area to be essential for the conservation and recovery of these coastal species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Maui—Coastal—Unit 2 consists of 42 ac (17 ha) of State land, and 26 ac (11 ha) of privately owned land, from Wahinepee Stream to Moiki Point on the northern coast of east Maui. This unit includes the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the coastal ecosystem (see Table 4). Although Maui—Coastal—Unit 2 is not currently occupied by *Brighamia rockii, Cyperus pennatiformis, Ischaemum byrone, Peucedanum sandwicense,* or *Vigna o-wahuensis,* we have determined this area to be essential for the conservation and recovery of these coastal species because it provides the physical or biological features necessary for the reestablishment of wild populations within the historical ranges of the species. Due to their small numbers of individuals or low population sizes, these species require suitable habitat and space for expansion or reintroduction to achieve population levels that could achieve recovery.

Maui—Coastal—Unit 3 consists of 13 ac (5 ha) of State land, and 40 ac (16 ha) of privately owned land, from Waianu to Wailua Nui Bay on the northern coast of east Maui. This unit is occupied by the plant *Ischaemum byrone* and includes the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the coastal ecosystem (see Table 4). This unit also contains unoccupied habitat that is essential to the conservation of this species by providing the PCEs necessary for the expansion of the existing wild populations. Although Maui—Coastal—Unit 3 is not known to be occupied by *Brighamia rockii, Cyperus pennatiformis, Peucedanum sandwicense,* or *Vigna o-wahuensis,* we have determined this area to be essential for the conservation and recovery of these coastal species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Maui—Coastal—Unit 4 consists of 107 ac (43 ha) of State land, and 136 ac (55 ha) of privately owned land, from Papiha Point to Honolulu Nui Bay on the northeastern coast of east Maui. This unit is occupied by the plants *Ischaemum byrone* and *Peucedanum sandwicense,* and includes the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the coastal ecosystem (see Table 4). This unit also contains unoccupied habitat that is essential to the conservation of these species by providing the PCEs necessary for the expansion of the existing wild populations. Although Maui—Coastal—Unit 4 is not known to be occupied by *Brighamia rockii, Cyperus pennatiformis,* or *Vigna o-wahuensis,* we have determined this area to be essential for the conservation and recovery of these coastal species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Maui—Coastal—Unit 5 consists of 27 ac (11 ha) of State land from Keakulikuli Point to Pailoa Bay on the northeastern coast of east Maui. This unit is occupied by the plant *Ischaemum byrone* and includes the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory

native plant species identified as physical or biological features in the coastal ecosystem (See Table 4). This unit also contains unoccupied habitat that is essential to the conservation of this species by providing the PCEs necessary for the expansion of the existing wild populations. Although Maui—Coastal—Unit 5 is not known to be occupied by *Brighamia rockii, Cyperus pennatiformis, Peucedanum sandwicense,* or *Vigna o-wahuensis,* we have determined this area to be essential for the conservation and recovery of these coastal species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Maui—Coastal—Unit 6 consists of 357 ac (144 ha) of State land at Kamanamana on the southern coast of East Maui. This unit includes the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the coastal ecosystem (see Table 4). Although Maui—Coastal—Unit 6 is not currently occupied by *Brighamia rockii, Cyperus pennatiformis, Ischaemum byrone, Peucedanum sandwicense,* or *Vigna o-wahuensis,* we have determined this area to be essential for the conservation and recovery of these coastal species because it provides the PCEs necessary for the reestablishment of wild populations within the historical ranges of the species. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Maui—Coastal—Unit 7 consists of 40 ac (16 ha) of State land, and 147 ac (59 ha) of privately owned land at Naholoku, from Kailio Point to Mokulau, on the southern coast of east Maui. This unit includes the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the coastal ecosystem (see Table 4). Although Maui—Coastal—Unit 7 is not currently occupied by *Brighamia rockii, Cyperus pennatiformis, Ischaemum byrone, Peucedanum sandwicense,* or *Vigna o-wahuensis,* we have determined this area to be essential for the conservation and recovery of these coastal species because it provides the PCEs necessary for the reestablishment of wild populations within the historical ranges of the species. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Maui—Coastal—Unit 8 consists of 597 ac (241 ha) of State land and less than 1 ac (ha) of privately owned land from Kiakeana Point to Manawainui on the southern coast of east Maui. This unit includes the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the coastal ecosystem (see Table 4). Although Maui—Coastal—Unit 8 is not currently occupied by *Brighamia rockii, Cyperus pennatiformis, Ischaemum byrone, Peucedanum sandwicense,* or *Vigna o-wahuensis,* we have determined this area to be essential for the conservation and recovery of these coastal species because it provides the PCEs necessary for the reestablishment of wild populations within the historical ranges of the species. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Maui—Coastal—Unit 9 consists of 184 ac (74 ha) of State land, 5 ac (2 ha) of County land, and 205 ac (83 ha) of privately owned land, from Honokohau Bay to Kaikaina on the northwestern coast of west Maui. This unit is occupied by the plants *Sesbania tomentosa* and *Schenkia sebaeoides,* and includes the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the coastal ecosystem (see Table 4). This unit also contains unoccupied habitat that is essential to the conservation of these species by providing the PCEs necessary for the expansion of the existing wild populations. Although Maui—Coastal—Unit 9 is not known to be occupied by *Brighamia rockii,* we have determined this area to be essential for the conservation and recovery of this coastal species because it provides the PCEs necessary for the reestablishment of wild populations within its historical range. Due to the small numbers of individuals or low population sizes, this species requires suitable habitat and space for expansion or reintroduction to achieve population levels that could approach recovery.

Maui—Coastal—Unit 10 consists of 215 ac (87 ha) of State land and 219 ac (89 ha) of privately owned land, from Kahakuloa Head to Waihee Point on the northeastern coast of west Maui. This unit is occupied by the plants *Sesbania tomentosa* and *Schenkia sebaeoides,* and includes the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the coastal ecosystem (see Table 4). This unit also contains unoccupied habitat that is essential to the conservation of these species by providing the PCEs necessary for the expansion of the existing wild populations. Although Maui—Coastal—Unit 10 is not known to be occupied by *Brighamia rockii,* we have determined this area to be essential for the conservation and recovery of this coastal species because it provides the PCEs necessary for the reestablishment of wild populations within its historical range. Due to the small numbers of individuals or low population sizes, this species requires suitable habitat and space for expansion or reintroduction to achieve population levels that could approach recovery.

Maui—Coastal—Unit 11 consists of 6 ac (3 ha) of State land on Mokeehia Island on the northeastern coast of west Maui. This unit is occupied by the plant *Schenkia sebaeoides,* and includes the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the coastal ecosystem (see Table 4). This unit also contains unoccupied habitat that is essential to the conservation of this species by providing the PCEs necessary for the expansion of the existing wild populations. Although Maui—Coastal—Unit 11 is not currently occupied by *Brighamia rockii* or *Sesbania tomentosa,* we have determined this area to be essential for the conservation and recovery of these coastal species because it provides the PCEs necessary for the reestablishment of wild populations within the historical ranges of the species. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Maui—Lowland Dry—Unit 1 consists of 12,999 ac (5,260 ha) of State land, and 9,197 ac (3,722 ha) of privately owned land, from Kanaio to Kahualau Gulch on the southern slopes of east Maui. This unit is occupied by the plants *Alectryon macrococcus, Bonamia menziesii, Cenchrus agrimonioides, Flueggea*

neowawraea, Melanthera kamolensis, Melicope adscendens, Santalum haleakalae var. *lanaiense, Sesbania tomentosa, Spermolepis hawaiiensis,* and *Zanthoxylum hawaiiense* and includes the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the lowland dry ecosystem (see Table 4). This unit also contains unoccupied habitat that is essential to the conservation of these species by providing the PCEs necessary for the expansion of the existing wild populations. Although Maui—Lowland Dry—Unit 1 is not known to be occupied by *Bidens micrantha* ssp. *kalealaha, Canavalia pubescens, Colubrina oppositifolia, Ctenitis squamigera, Hibiscus brackenridgei, Melicope mucronulata, Neraudia sericea, Nototrichium humile,* or *Solanum incompletum,* we have determined this area to be essential for the conservation and recovery of these lowland dry species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Maui—Lowland Dry—Unit 2 consists of 1,851 ac (749 ha) of State land, and 762 ac (308 ha) of privately owned land, at Keokea on the southern slopes of east Maui. This unit is occupied by the plants *Bonamia menziesii, Canavalia pubescens,* and *Hibiscus brackenridgei,* and includes the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the lowland dry ecosystem (see Table 4). This unit also contains unoccupied habitat that is essential to the conservation of these species by providing the PCEs necessary for the expansion of the existing wild populations. Although Maui—Lowland Dry—Unit 2 is not known to be occupied by *Alectryon macrococcus, Bidens micrantha* ssp. *kalealaha, Cenchrus agrimonioides, Colubrina oppositifolia, Ctenitis squamigera, Flueggea neowawraea, Melanthera kamolensis, Melicope adscendens, M. mucronulata, Neraudia sericea, Nototrichium humile, Santalum haleakalae* var. *lanaiense, Sesbania tomentosa, Solanum incompletum, Spermolepis hawaiiensis,* or *Zanthoxylum hawaiiense,* we have determined this area to be essential for the conservation and recovery of these lowland dry species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Maui—Lowland Dry—Unit 3 consists of less than 1 ac (ha) of County land, and 1,089 ac (441 ha) of privately owned land, at Paeahu-Palauea on the southern slopes of east Maui. This unit is occupied by the plants *Canavalia pubescens* and *Hibiscus brackenridgei,* and includes the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the lowland dry ecosystem (see Table 4). This unit also contains unoccupied habitat that is essential to the conservation of these species by providing the PCEs necessary for the expansion of the existing wild populations. Although Maui—Lowland Dry—Unit 3 is not known to be occupied by *Alectryon macrococcus, Bidens micrantha* ssp. *kalealaha, Bonamia menziesii, Cenchrus agrimonioides, Colubrina oppositifolia, Ctenitis squamigera, Flueggea neowawraea, Melanthera kamolensis, Melicope adscendens, M. mucronulata, Neraudia sericea, Nototrichium humile, Santalum haleakalae* var. *lanaiense, Sesbania tomentosa, Solanum incompletum, Spermolepis hawaiiensis,* or *Zanthoxylum hawaiiense,* we have determined this area to be essential for the conservation and recovery of these lowland dry species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Maui—Lowland Dry—Unit 4 consists of 1,283 ac (519 ha) of State land (including the Department of Land and Natural Resources) at Ahihi-Kinau Natural Area Reserve on the southern slopes of east Maui. This unit is occupied by the plant *Canavalia pubescens,* and includes the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the lowland dry ecosystem (See Table 4). This unit also contains unoccupied habitat that is essential to the conservation of this species by providing the PCEs necessary for the expansion of the existing wild populations. Although Maui—Lowland Dry—Unit 4 is not known to be occupied by *Alectryon macrococcus, Bidens micrantha* ssp. *kalealaha, Bonamia menziesii, Cenchrus agrimonioides, Colubrina oppositifolia, Ctenitis squamigera, Flueggea neowawraea, Hibiscus brackenridgei, Melanthera kamolensis, Melicope adscendens, M. mucronulata, Neraudia sericea, Nototrichium humile, Santalum haleakalae* var. *lanaiense, Sesbania tomentosa, Solanum incompletum, Spermolepis hawaiiensis,* or *Zanthoxylum hawaiiense,* we have determined this area to be essential for the conservation and recovery of these lowland dry species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Maui—Lowland Dry—Unit 5 consists of 3,685 ac (1,491 ha) of State land, and 1,763 ac (713 ha) of privately owned land, from Panaewa to Waikapu Valley on the western and southern slopes of west Maui. This unit is occupied by the plants *Asplenium dielerectum, Bidens campylotheca* ssp. *pentamera, Cenchrus agrimonioides, Ctenitis squamigera, Gouania hillebrandii, Hibiscus brackenridgei, Remya mauiensis, Santalum haleakalae* var. *lanaiense, Sesbania tomentosa,* and *Spermolepis hawaiiensis,* and includes the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the lowland dry ecosystem (see Table 4). This unit also contains unoccupied habitat that is essential to the conservation of these species by providing the PCEs necessary for the expansion of the existing wild populations. Although Maui—Lowland Dry—Unit 5 is not known to be occupied by *Cyanea obtusa, Hesperomannia arbuscula, Kadua coriacea, Lysimachia lydgatei, Neraudia sericea, Schiedea salicaria, Tetramolopium capillare,* or *T. remyi,* we have determined this area to be essential for the conservation and recovery of these lowland dry species because it provides the PCEs necessary

for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Maui—Lowland Dry—Unit 6 consists of 4 ac (2 ha) of State land, and 575 ac (233 ha) of privately owned land, from Paleaahu Gulch to Puu Hona on the southern slopes of west Maui. This unit is occupied by the plants *Hibiscus brackenridgei* and *Schiedea salicaria,* and includes the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the lowland dry ecosystem (see Table 4). This unit also contains unoccupied habitat that is essential to the conservation of these species by providing the PCEs necessary for the expansion of the existing wild populations. Although Maui—Lowland Dry—Unit 6 is not known to be occupied by *Asplenium dielerectum, Bidens campylotheca* ssp. *pentamera, Cenchrus agrimonioides, Ctenitis squamigera, Cyanea obtusa, Gouania hillebrandii, Hesperomannia arbuscula, Kadua coriacea, Lysimachia lydgatei, Neraudia sericea, Remya mauiensis, Santalum haleakalae* var. *lanaiense, Sesbania tomentosa, Spermolepis hawaiiensis, Tetramolopium capillare,* or *T. remyi,* we have determined this area to be essential for the conservation and recovery of these lowland dry species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Maui—Lowland Mesic—Unit 1 consists of 1,172 ac (474 ha) of State land, 256 ac (104 ha) of privately owned land, and 502 ac (203 ha) of federally owned land (Haleakala National Park), from Manawainui Valley to Kukuiula on the eastern slopes of east Maui. This unit is occupied by the plants *Cyanea asplenifolia, C. copelandii* ssp. *haleakalaensis,* and *Huperzia mannii,* and includes the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the lowland mesic ecosystem (See Table 4). This unit also contains unoccupied habitat that is essential to the conservation of these species by providing the PCEs necessary for the expansion of the existing wild populations. Although Maui—Lowland Mesic—Unit 1 is not known to be occupied by *Ctenitis squamigera* or *Solanum incompletum,* we have determined this area to be essential for the conservation and recovery of these lowland mesic species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Maui—Lowland Mesic—Unit 2 consists of 1,315 ac (532 ha) of State land, and 2,109 ac (854 ha) of privately owned land, from Honokohau to Launiupoko on the western slopes of west Maui. This unit is occupied by the plants *Bidens campylotheca* ssp. *pentamera, Colubrina oppositifolia, Ctenitis squamigera, Remya mauiensis, Santalum haleakalae* var. *lanaiense,* and *Zanthoxylum hawaiiense,* and includes the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the lowland mesic ecosystem (see Table 4). This unit also contains unoccupied habitat that is essential to the conservation of these species by providing the PCEs necessary for the expansion of the existing wild populations. Although Maui—Lowland Mesic—Unit 2 is not known to be occupied by *Asplenium dielerectum,* we have determined this area to be essential for the conservation and recovery of this lowland mesic species because it provides the PCEs necessary for the reestablishment of wild populations within its historical range. Due to its small numbers of individuals or low population sizes, this species requires suitable habitat and space for expansion or reintroduction to achieve population levels that could approach recovery.

Maui—Lowland Mesic—Unit 3 (and)

Palmeria dolei—Unit 1—Lowland Mesic (and)

Pseudonestor xanthophrys—Unit 1—Lowland Mesic

This area consists of 477 ac (193 ha) of State land at Ukumehame on the southern slopes of west Maui. These units include the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the lowland mesic ecosystem (see Table 4). Although Maui—Lowland Mesic—Unit 3 is not currently occupied by the plants *Asplenium dielerectum, Bidens campylotheca* ssp. *pentamera, Colubrina oppositifolia, Ctenitis squamigera, Remya mauiensis, Santalum haleakalae* var. *lanaiense,* or *Zanthoxylum hawaiiense;* or by the akohekohe (*Palmeria dolei*) and kiwikiu (*Pseudonestor xanthophrys*), we have determined this area to be essential for the conservation and recovery of these lowland mesic species because it provides the PCEs for the reestablishment of wild populations within the historical ranges of the species. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Maui—Lowland Wet—Unit 1 (and)

Palmeria dolei—Unit 2—Lowland Wet (and)

Pseudonestor xanthophrys—Unit 2—Lowland Wet

This area consists of 10,822 ac (4,379 ha) of State land, 13,844 ac (5,602 ha) of privately owned land, and 2,038 ac (825 ha) of federally owned land (Haleakala National Park), from Haiku Uka to Kipahulu Valley on the northern and eastern slopes of east Maui. These units include the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the lowland wet ecosystem (see Table 4). They are are occupied by the plants *Bidens campylotheca* ssp. *waihoiensis, Clermontia samuelii, Cyanea asplenifolia, C. copelandii* ssp. *haleakalaensis, C. duvalliorum, C. hamatiflora* ssp. *hamatiflora, C. kunthiana, C. maritae, C. mceldowneyi, Huperzia mannii, Melicope balloui,* and *M. ovalis.* These units also contain unoccupied habitat that is essential to the conservation of these species by providing the PCEs necessary for the expansion of the existing wild populations. Although Maui—Lowland Wet—Unit 1 is not known to be occupied by the plants *Clermontia oblongifolia* ssp. *mauiensis, C. peleana, Mucuna sloanei* var. *persericea,* or *Wikstroemia villosa;* or by the forest birds, the akohekohe (*Palmeria dolei*) and kiwikiu (*Pseudonestor xanthophrys*), we have determined this area to be essential for the conservation and recovery of these lowland wet species because it provides the PCEs necessary for the reestablishment of

wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Maui—Lowland Wet—Unit 2 (and)

Palmeria dolei—Unit 3—Lowland Wet (and)

Pseudonestor xanthophrys—Unit 3—Lowland Wet (and)

This area consists of 65 ac (26 ha) of State land, and 5,001 ac (2,024 ha) of privately owned land (partially within Puu Kukui Watershed Preserve), from Kahana to Honokohua and Honolua valleys, on the northwestern slopes of west Maui. These units include the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the lowland wet ecosystem (see Table 4). They are occupied by the plants *Ctenitis squamigera, Cyanea asplenifolia, C. lobata, C. magnicalyx, Cyrtandra filipes, C. munroi,* and *Santalum haleakalae* var. *lanaiense.* These units also contain unoccupied habitat that is essential to the conservation of these species by providing the PCEs necessary for the expansion of the existing wild populations. Although Maui—Lowland Wet—Unit 2 is not known to be occupied by the plants *Alectryon macrococcus, Asplenium dielerectum, Bidens conjuncta, B. micrantha* ssp. *kalealaha, Clermontia oblongifolia* ssp. *mauiensis, Cyanea glabra, C. kunthiana, Diplazium molokaiense, Hesperomannia arborescens, H. arbuscula, Huperzia mannii, Isodendrion pyrifolium, Kadua laxiflora, Peucedanum sandwicense, Phyllostegia bracteata, Pteris lidgatei, Remya mauiensis,* or *Wikstroemia villosa;* or by the forest birds, the akohekohe (*Palmeria dolei*) and kiwikiu (*Pseudonestor xanthophrys*), we have determined this area to be essential for the conservation and recovery of these lowland wet species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Newcombia cumingi—Unit 1—Lowland Wet

This area consists of 543 ac (220 ha) of private land and 56 ac (23) of State land, between Honokahua and Honokowai valleys, on the western slopes of west Maui. This unit is occupied by the tree snail *Newcombia cumingi,* and includes the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the lowland wet ecosystem (see Table 4). This unit also contains unoccupied habitat that is essential to the conservation of this species by providing the PCEs necessary for the expansion of the existing wild populations. Due to the small numbers of individuals or low population sizes, this species requires suitable habitat and space for expansion or reintroduction to achieve population levels that could approach recovery.

Maui—Lowland Wet—Unit 3 (and)

Palmeria dolei—Unit 4—Lowland Wet (and)

Pseudonestor xanthophrys—Unit 4—Lowland Wet

This area consists of 1,247 ac (505 ha) of State land, and 180 ac (73 ha) of privately owned land (partially within Puu Kukui Watershed Preserve), at Honanana Valley on the northeastern slopes of west Maui. These units include the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the lowland wet ecosystem (see Table 4). They are occupied by the plants *Bidens conjuncta, Cyanea asplenifolia,* and *Pteris lidgatei.* These units also contain unoccupied habitat that is essential to the conservation of these species by providing the PCEs necessary for the expansion of the existing wild populations. Although Maui—Lowland Wet—Unit 3 is not known to be occupied by the plants *Alectryon macrococcus, Asplenium dielerectum, Bidens micrantha* ssp. *kalealaha, Clermontia oblongifolia* ssp. *mauiensis, Ctenitis squamigera, Cyanea glabra, C. kunthiana, C. lobata, C. magnicalyx, Cyrtandra filipes, C. munroi, Diplazium molokaiense, Hesperomannia arborescens, H. arbuscula, Huperzia mannii, Isodendrion pyrifolium, Kadua laxiflora, Peucedanum sandwicense, Phyllostegia bracteata, Remya mauiensis, Santalum haleakalae* var. *lanaiense,* or *Wikstroemia villosa;* or by the forest birds, the akohekohe (*Palmeria dolei*) and kiwikiu (*Pseudonestor xanthophrys*), we have determined this area to be essential for the conservation and recovery of these lowland wet species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Maui—Lowland Wet—Unit 4 (and)

Palmeria dolei—Unit 5—Lowland Wet (and)

Pseudonestor xanthophrys—Unit 5—Lowland Wet

This area consists of 864 ac (350 ha) of State land, and 301 ac (122 ha) of County land, at Kahakuloa Valley on the northeastern slopes of west Maui. These units include the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the lowland wet ecosystem (see Table 4). They are occupied by the plants *Bidens conjuncta, Cyanea asplenifolia, Cyrtandra munroi,* and *Hesperomannia arborescens.* These units also contain unoccupied habitat that is essential to the conservation of these species by providing the PCEs necessary for the expansion of the existing wild populations. Although Maui—Lowland Wet—Unit 4 is not known to be occupied by the plants *Alectryon macrococcus, Asplenium dielerectum, Bidens micrantha* ssp. *kalealaha, Clermontia oblongifolia* ssp. *mauiensis, Ctenitis squamigera, Cyanea glabra, C. kunthiana, C. lobata, C. magnicalyx, Cyrtandra filipes, Diplazium molokaiense, Hesperomannia arbuscula, Huperzia mannii, Isodendrion pyrifolium, Kadua laxiflora, Peucedanum sandwicense, Phyllostegia bracteata, Pteris lidgatei, Remya mauiensis, Santalum haleakalae* var. *lanaiense,* or *Wikstroemia villosa;* or by the forest birds, the akohekohe (*Palmeria dolei*) and kiwikiu (*Pseudonestor xanthophrys*), we have determined this area to be essential for the conservation and recovery of these lowland wet species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving

population levels necessary for recovery.

Maui—Lowland Wet—Unit 5 (and)

Palmeria dolei—Unit 6—Lowland Wet (and)

Pseudonestor xanthophrys—Unit 6—Lowland Wet

This area consists of 30 ac (12 ha) of State land, and 2,082 ac (843 ha) of privately owned land, at Iao Valley on the eastern side of west Maui. These units include the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the lowland wet ecosystem (see Table 4). They are occupied by the plants *Alectryon macrococcus, Asplenium dielerectum,* and *Hesperomannia arbuscula.* These units also contain unoccupied habitat that is essential to the conservation of these species by providing the PCEs necessary for the expansion of the existing wild populations. Although Maui—Lowland Wet—Unit 5 is not known to be occupied by the plants *Bidens conjuncta, B. micrantha* ssp. *kalealaha, Clermontia oblongifolia* ssp. *mauiensis, Ctenitis squamigera, Cyanea asplenifolia, C. glabra, C. kunthiana, C. lobata, C. magnicalyx, Cyrtandra filipes, C. munroi, Diplazium molokaiense, Hesperomannia arborescens, Huperzia mannii, Isodendrion pyrifolium, Kadua laxiflora, Peucedanum sandwicense, Phyllostegia bracteata, Pteris lidgatei, Remya mauiensis, Santalum haleakalae* var. *lanaiense,* or *Wikstroemia villosa;* or by the forest birds, the akohekohe (*Palmeria dolei*) and kiwikiu (*Pseudonestor xanthophrys*), we have determined this area to be essential for the conservation and recovery of these lowland wet species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Maui—Lowland Wet—Unit 6 (and)

Palmeria dolei—Unit 7—Lowland Wet (and)

Pseudonestor xanthophrys—Unit 7—Lowland Wet

This area consists of 136 ac (55 ha) of State land, and 503 ac (204 ha) of privately owned land, at upper Honokowai and Wahikuli valleys on the western slopes of west Maui. These units includes the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the lowland wet ecosystem (see Table 4). They are occupied by the plants *Alectryon macrococcus, Bidens micrantha* ssp. *kalealaha, Cyanea asplenifolia, C. lobata, Cyrtandra munroi,* and *Santalum haleakalae* var. *lanaiense.* These units also contain unoccupied habitat that is essential to the conservation of these species by providing the PCEs necessary for the expansion of the existing wild populations. Although Maui—Lowland Wet—Unit 6 is not known to be occupied by the plants *Asplenium dielerectum, Bidens conjuncta, Clermontia oblongifolia* ssp. *mauiensis, Ctenitis squamigera, Cyanea glabra, C. kunthiana, C. magnicalyx, Cyrtandra filipes, Diplazium molokaiense, Hesperomannia arborescens, H. arbuscula, Huperzia mannii, Isodendrion pyrifolium, Kadua laxiflora, Peucedanum sandwicense, Phyllostegia bracteata, Pteris lidgatei, Remya mauiensis,* or *Wikstroemia villosa;* or by the forest birds, the akohekohe (*Palmeria dolei*) and kiwikiu (*Pseudonestor xanthophrys*), we have determined this area to be essential for the conservation and recovery of these lowland wet species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Maui—Lowland Wet—Unit 7 (and)

Palmeria dolei—Unit 8—Lowland Wet (and)

Pseudonestor xanthophrys—Unit 8—Lowland Wet

This area consists of 898 ac (364 ha) of State land at Olowalu Valley, on the southern slopes of west Maui. These units include the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the lowland wet ecosystem (see Table 4). Although Maui—Lowland Wet—Unit 7 is not currently occupied by the plants *Alectryon macrococcus, Asplenium dielerectum, Bidens conjuncta, B. micrantha* ssp. *kalealaha, Clermontia oblongifolia* ssp. *mauiensis, Ctenitis squamigera, Cyanea asplenifolia, C. glabra, C. kunthiana, C. lobata, C. magnicalyx, Cyrtandra filipes, C. munroi, Diplazium molokaiense, Hesperomannia arborescens, H. arbuscula, Huperzia mannii, Isodendrion pyrifolium, Kadua laxiflora, Peucedanum sandwicense, Phyllostegia bracteata, Pteris lidgatei, Remya mauiensis, Santalum haleakalae* var. *lanaiense,* or *Wikstroemia villosa;* or by the forest birds, the akohekohe (*Palmeria dolei*) and kiwikiu (*Pseudonestor xanthophrys*), we have determined this area to be essential for the conservation and recovery of these lowland wet species because it provides the PCEs necessary for the reestablishment of wild populations within the historical ranges of the species. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Maui—Lowland Wet—Unit 8 (and)

Palmeria dolei—Unit 9—Lowland Wet (and)

Pseudonestor xanthophrys—Unit 9—Lowland Wet

This area consists of 230 ac (93 ha) of State land at upper Ukumehame Gulch, on the southern slopes of west Maui. These units include the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the lowland wet ecosystem (see Table 4). Although Maui—Lowland Wet—Unit 8 is not currently occupied by the plants *Alectryon macrococcus, Asplenium dielerectum, Bidens conjuncta, B. micrantha* ssp. *kalealaha, Clermontia oblongifolia* ssp. *mauiensis, Ctenitis squamigera, Cyanea asplenifolia, C. glabra, C. kunthiana, C. lobata, C. magnicalyx, Cyrtandra filipes, C. munroi, Diplazium molokaiense, Hesperomannia arborescens, H. arbuscula, Huperzia mannii, Isodendrion pyrifolium, Kadua laxiflora, Peucedanum sandwicense, Phyllostegia bracteata, Pteris lidgatei, Remya mauiensis, Santalum haleakalae* var. *lanaiense,* or *Wikstroemia villosa;* or by the forest birds, the akohekohe (*Palmeria dolei*) and kiwikiu (*Pseudonestor xanthophrys*), we have determined this area to be essential for the conservation and recovery of these lowland wet species because it provides the PCEs necessary for the reestablishment of wild populations within the historical ranges of the species. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion

or reintroduction are essential to achieving population levels necessary for recovery.

Maui—Montane Wet—Unit 1 (and)

Palmeria dolei—Unit 10—Montane Wet (and)

Pseudonestor xanthophrys—Unit 10—Montane Wet

This area consists of 1,067 ac (432 ha) of State land and 6,747 ac (2,730 ha) of privately owned land, at Haiku Uka on the northern slopes of east Maui. These units include the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the montane wet ecosystem (see Table 4). They are occupied by the plants *Asplenium peruvianum* var. *insulare, Clermontia oblongifolia* ssp. *mauiensis, Cyanea copelandii* ssp. *haleakalaensis, C. duvalliorum, C. horrida, C. kunthiana, C. maritae, C. mceldowneyi, Diplazium molokaiense, Huperzia mannii, Melicope balloui,* and *Phyllostegia pilosa;* and by the forest birds, the akohekohe (*Palmeria dolei*) and kiwikiu (*Pseudonestor xanthophrys*). These units also contain unoccupied habitat that is essential to the conservation of these species by providing the PCEs necessary for the expansion of the existing wild populations. Although Maui—Montane Wet—Unit 1 is not known to be occupied by the plants *Adenophorus periens, Bidens campylotheca* ssp. *pentamera, B. campylotheca* ssp. *waihoiensis, Clermontia samuellii, Cyanea glabra, C. hamatiflora* ssp. *hamatiflora, Cyrtandra ferripilosa, Geranium hanaense, G. multiflorum, Melicope ovalis, Peperomia subpetiolata, Phyllostegia bracteata, P. mannii, Platanthera holochila, Schiedea jacobii,* or *Wikstroemia villosa,* we have determined this area to be essential for the conservation and recovery of these montane wet species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Maui—Montane Wet—Unit 2 (and)

Palmeria dolei—Unit 11—Montane Wet (and)

Pseudonestor xanthophrys—Unit 11—Montane Wet

This area consists of 4,075 ac (1,649 ha) of State land, 11,737 ac (4,750 ha) of privately owned land, and 875 ac (354 ha) of federally owned land (Haleakala National Park), from Haiku Uka to Puukaukanu and upper Waihoi Valley, on the northern and northeastern slopes of east Maui. These units include the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the montane wet ecosystem (see Table 4). They are occupied by the plants *Asplenium peruvianum* var. *insulare, Bidens campylotheca* ssp. *pentamera, B. campylotheca* ssp. *waihoiensis, Clermontia samuellii, Cyanea copelandii* ssp. *haleakalaensis, C. duvalliorum, C. hamatiflora* ssp. *hamatiflora, C. horrida, C. kunthiana, C. mceldowneyi, Geranium hanaense, G. multiflorum,* and *Wikstroemia villosa;* and by the forest birds, the akohekohe (*Palmeria dolei*) and kiwikiu (*Pseudonestor xanthophrys*). These units also contain unoccupied habitat that is essential to the conservation of these species by providing the PCEs necessary for the expansion of the existing wild populations. Although Maui—Montane Wet—Unit 2 is not known to be occupied by the plants *Adenophorus periens, Clermontia oblongifolia* ssp. *mauiensis, Cyanea glabra, C. maritae, Cyrtandra ferripilosa, Diplazium molokaiense, Huperzia mannii, Melicope balloui, M. ovalis, Peperomia subpetiolata, Phyllostegia bracteata, P. mannii, P. pilosa, Platanthera holochila,* and *Schiedea jacobii,* we have determined this area to be essential for the conservation and recovery of these montane wet species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Maui—Montane Wet—Unit 3 (and)

Palmeria dolei—Unit 12—Montane Wet (and)

Pseudonestor xanthophrys—Unit 12—Montane Wet

This area consists of 2,228 ac (902 ha) of federally owned land (Haleakala National Park) in Kipahulu Valley, on the northeastern slopes of east Maui. These units include the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the montane wet ecosystem (see Table 4). They are occupied by the plants *Bidens campylotheca* ssp. *pentamera, B. campylotheca* ssp. *waihoiensis, Cyanea copelandii* ssp. *haleakalaensis, C. hamatiflora* ssp. *hamatiflora, C. maritae,* and *Melicope ovalis;* and by the forest bird, kiwikiu (*Pseudonestor xanthophrys*). These units also contain unoccupied habitat that is essential to the conservation of these species by providing the PCEs necessary for the expansion of the existing wild populations. Although Maui—Montane Wet—Unit 3 is not known to be occupied by the plants *Adenophorus periens, Asplenium peruvianum* var. *insulare, Clermontia oblongifolia* ssp. *mauiensis, C. samuellii, Cyanea duvalliorum, C. glabra, C. horrida, C. kunthiana, C. mceldowneyi, Cyrtandra ferripilosa, Diplazium molokaiense, Geranium hanaense, G. multiflorum, Huperzia mannii, Melicope balloui, Peperomia subpetiolata, Phyllostegia bracteata, P. mannii, P. pilosa, Platanthera holochila, Schiedea jacobii,* or *Wikstroemia villosa;* or by the forest bird akohekohe (*Palmeria dolei*), we have determined this area to be essential for the conservation and recovery of these montane wet species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Maui—Montane Wet—Unit 4 (and)

Palmeria dolei—Unit 13—Montane Wet (and)

Pseudonestor xanthophrys—Unit 13—Montane Wet

This area consists of 180 ac (73 ha) of State land and 1,653 ac (669 ha) of federally owned land (Haleakala National Park), in Kaapahu Valley on the northeastern slopes of east Maui. These units include the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the montane wet ecosystem (see Table 4). They are occupied by the plants *Clermontia samuellii, Cyanea copelandii* ssp. *haleakalaensis, C.*

hamatiflora ssp. *hamatiflora, C. horrida, C. kunthiana, C. maritae, Cyrtandra ferripilosa,* and *Huperzia mannii.* These units also contain unoccupied habitat that is essential to the conservation of these species by providing the PCEs necessary for the expansion of the existing wild populations. Although Maui—Montane Wet—Unit 4 is not known to be occupied by the plants *Adenophorus periens, Asplenium peruvianum* var. *insulare, Bidens campylotheca* ssp. *pentamera, B. campylotheca* ssp. *waihoiensis, Clermontia oblongifolia* ssp. *mauiensis, Cyanea duvalliorum, C. glabra, C. mceldowneyi, Diplazium molokaiense, Geranium hanaense, G. multiflorum, Melicope balloui, M. ovalis, Peperomia subpetiolata, Phyllostegia bracteata, P. mannii, P. pilosa, Platanthera holochila, Schiedea jacobii,* or *Wikstroemia villosa;* or by the forest birds, the akohekohe (*Palmeria dolei*) and kiwikiu (*Pseudonestor xanthophrys*), we have determined this area to be essential for the conservation and recovery of these montane wet species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Maui—Montane Wet—Unit 5 (and)

Palmeria dolei—Unit 14—Montane Wet (and)

Pseudonestor xanthophrys—Unit 14—Montane Wet

This area consists of 222 ac (90 ha) of State land, and 165 ac (67 ha) of federally owned land (Haleakala National Park), east of Kipahulu Valley on the eastern slopes of east Maui. These units include the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the montane wet ecosystem (see Table 4). Although Maui—Montane Wet—Unit 5 is not currently occupied by the plants *Adenophorus periens, Asplenium peruvianum* var. *insulare, Bidens campylotheca* ssp. *pentamera, B. campylotheca* ssp. *waihoiensis, Clermontia oblongifolia* ssp. *mauiensis, C. samuellii, Cyanea copelandii* ssp. *haleakalaensis, C. duvalliorum, C. glabra, C. hamatiflora* ssp. *hamatiflora, C. horrida, C. kunthiana, C. maritae, C. mceldowneyi, Cyrtandra ferripilosa, Diplazium molokaiense, Geranium hanaense, G. multiflorum, Huperzia mannii, Melicope balloui, M. ovalis, Peperomia subpetiolata, Phyllostegia bracteata, P. mannii, P. pilosa, Platanthera holochila, Schiedea jacobii,* or *Wikstroemia villosa;* or by the forest birds, the akohekohe (*Palmeria dolei*) and kiwikiu (*Pseudonestor xanthophrys*), we have determined this area to be essential for the conservation and recovery of these montane wet species because it provides the PCEs necessary for the reestablishment of wild populations within the historical ranges of the species. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Maui—Montane Wet—Unit 6 (and)

Palmeria dolei—Unit 15—Montane Wet (and)

Pseudonestor xanthophrys—Unit 15—Montane Wet

This area consists of 1,113 ac (451 ha) of State land, 471 ac (191 ha) of County land, and 2,380 ac (963 ha) of privately owned land, at the summit and surrounding areas on west Maui. These units include the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the montane wet ecosystem (see Table 4). They are occupied by the plants *Bidens conjuncta, Calamagrostis hillebrandii, Cyanea kunthiana, Geranium hillebrandii, Myrsine vaccinioides,* and *Sanicula purpurea.* These units also contain unoccupied habitat that is essential to the conservation of these species by providing the PCEs necessary for the expansion of the existing wild populations. Although Maui—Montane Wet—Unit 6 is not known to be occupied by the plants *Acaena exigua, Cyrtandra oxybapha, Huperzia mannii, Phyllostegia bracteata,* or *Platanthera holochila;* or by the forest birds, the akohekohe (*Palmeria dolei*) and kiwikiu (*Pseudonestor xanthophrys*), we have determined this area to be essential for the conservation and recovery of these montane wet species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Maui—Montane Wet—Unit 7 (and)

Palmeria dolei—Unit 16—Montane Wet (and)

Pseudonestor xanthophrys—Unit 16—Montane Wet

This area consists of 80 ac (32 ha) of State land, and 528 ac (214 ha) of privately owned land, at Hanaula and Pohakea Gulch on the southeastern slopes of west Maui. These units include the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the montane wet ecosystem (see Table 4). They are occupied by the plants *Cyrtandra oxybapha* and *Platanthera holochila,* and contain unoccupied habitat that is essential to the conservation of these species by providing the PCEs necessary for the expansion of the existing wild populations. Although Maui—Montane Wet—Unit 7 is not known to be occupied by the plants *Acaena exigua, Bidens conjuncta, Calamagrostis hillebrandii, Cyanea kunthiana, Geranium hillebrandii, Huperzia mannii, Myrsine vaccinioides, Phyllostegia bracteata,* or *Sanicula purpurea;* or by the forest birds, the akohekohe (*Palmeria dolei*) and kiwikiu (*Pseudonestor xanthophrys*), we have determined this area to be essential for the conservation and recovery of these montane wet species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Maui—Montane Wet—Unit 8 (and)

Palmeria dolei—Unit 17—Montane Wet (and)

Pseudonestor xanthophrys—Unit 17—Montane Wet

This area consists of 46 ac (19 ha) of privately owned land at the summit of Kapilau Ridge on the eastern slopes of west Maui. These units include the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the montane wet ecosystem (see Table 4). Although Maui—Montane Wet—Unit 8 is not currently occupied by the plants *Acaena exigua, Bidens conjuncta, Calamagrostis hillebrandii, Cyanea kunthiana, Cyrtandra oxybapha,*

Geranium hillebrandii, Huperzia mannii, Myrsine vaccinioides, Phyllostegia bracteata, Platanthera holochila, or *Sanicula purpurea;* or by the forest birds, the akohekohe (*Palmeria dolei*) and kiwikiu (*Pseudonestor xanthophrys*), we have determined this area to be essential for the conservation and recovery of these montane wet species because it provides the PCEs necessary for the reestablishment of wild populations within the historical ranges of the species. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Maui—Montane Mesic—Unit 1 (and)

Palmeria dolei—Unit 18—Montane Mesic (and)

Pseudonestor xanthophrys—Unit 18—Montane Mesic

This area consists of 7,277 ac (2,945 ha) of State land, 18 ac (7 ha) of County land, 10,781 ac (4,363 ha) of privately owned land, and 2,897 ac (1,172 ha) of federally owned land (Haleakala National Park), almost completely circumscribing the summit of Haleakala on east Maui. These units include the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the montane mesic ecosystem (see Table 4). They are occupied by the plants *Argyroxiphium sandwicense* ssp. *macrocephalum, Asplenium dielerectum, A. peruvianum* var. *insulare, Bidens campylotheca* ssp. *pentamera, Clermontia lindseyana, Cyanea horrida, C. mceldowneyi, C. obtusa, Cyrtandra ferripilosa, C. oxybapha, Diplazium molokaiense, Geranium arboreum, G. multiflorum, Huperzia mannii, Melicope adscendens, Neraudia sericea,* and *Santalum haleakalae* var. *lanaiense;* and by the forest birds, the akohekohe (*Palmeria dolei*) and kiwikiu (*Pseudonestor xanthophrys*). These units also contain unoccupied habitat that is essential to the conservation of these species by providing the PCEs necessary for the expansion of the existing wild populations. Although Maui—Montane Mesic—Unit 1 is not known to be occupied by the plants *Alectryon macrococcus, Bidens micrantha* ssp. *kalealaha, Cyanea glabra, C. hamatiflora* ssp. *hamatiflora, C. kunthiana, Phyllostegia bracteata, P. mannii, Wikstroemia villosa,* or *Zanthoxylum hawaiiense,* we have determined this area to be essential for the conservation and recovery of these montane mesic species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Maui—Montane Mesic—Unit 2 (and)

Palmeria dolei—Unit 19—Montane Mesic (and)

Pseudonestor xanthophrys—Unit 19—Montane Mesic

This area consists of 124 ac (50 ha) of State land, and 242 ac (98 ha) of privately owned land, at Helu and the upper reaches of Puehuehunui on the southern slopes of west Maui. These units include the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the montane mesic ecosystem (see Table 4). They are occupied by the plants *Ctenitis squamigera, Cyanea magnicalyx, Diplazium molokaiense, Lysimachia lydgatei, Santalum haleakalae* var. *lanaiense, Stenogyne kauaulaensis,* and *Zanthoxylum hawaiiense.* These units also contain unoccupied habitat that is essential to the conservation of these species by providing the PCEs necessary for the expansion of the existing wild populations. Although Maui—Montane Mesic—Unit 2 is not known to be occupied by the plants *Geranium hillebrandii, Huperzia mannii,* or *Remya mauiensis;* or by the forest birds, the akohekohe (*Palmeria dolei*) and kiwikiu (*Pseudonestor xanthophrys*), we have determined this area to be essential for the conservation and recovery of these montane mesic species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Maui—Montane Mesic—Unit 3 (and)

Palmeria dolei—Unit 20—Montane Mesic (and)

Pseudonestor xanthophrys—Unit 20—Montane Mesic

This area consists of 174 ac (70 ha) of State land, and 44 ac (18 ha) of privately owned land, at Lihau on the southwestern slopes of west Maui. These units include the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the montane mesic ecosystem (see Table 4). They are occupied by the plants *Geranium hillebrandii, Huperzia mannii,* and *Lysimachia lydgatei,* and contain unoccupied habitat that is essential to the conservation of these species by providing the PCEs necessary for the expansion of the existing wild populations. Although Maui—Montane Mesic—Unit 3 is not known to be occupied by the plants *Ctenitis squamigera, Cyanea magnicalyx, Diplazium molokaiense, Remya mauiensis, Santalum haleakalae* var. *lanaiense, Stenogyne kauaulaensis,* or *Zanthoxylum hawaiiense;* or by the forest birds, the akohekohe (*Palmeria dolei*) and kiwikiu (*Pseudonestor xanthophrys*), we have determined this area to be essential for the conservation and recovery of these montane mesic species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Maui—Montane Mesic—Unit 4 (and)

Palmeria dolei—Unit 21—Montane Mesic (and)

Pseudonestor xanthophrys—Unit 21—Montane Mesic

This area consists of 72 ac (29 ha) of State land at Halepohaku and upper Ukumehame Gulch on the southern slopes of west Maui. These units include the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the montane mesic ecosystem (see Table 4). They are occupied by the plant *Lysimachia lydgatei,* and contain unoccupied habitat that is essential to the conservation of this species by providing the PCEs necessary for the expansion of the existing wild populations. Although Maui—Montane Mesic—Unit 4 is not known to be occupied by the plants *Ctenitis squamigera, Cyanea magnicalyx, Diplazium molokaiense, Geranium hillebrandii, Huperzia mannii, Remya mauiensis, Santalum haleakalae* var. *lanaiense, Stenogyne kauaulaensis,* or *Zanthoxylum hawaiiense;* or by the forest birds, the akohekohe (*Palmeria dolei*) and kiwikiu (*Pseudonestor*

xanthophrys), we have determined this area to be essential for the conservation and recovery of these montane mesic species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Maui—Montane Mesic—Unit 5 (and)

Palmeria dolei—Unit 22—Montane Mesic (and)

Pseudonestor xanthophrys—Unit 22—Montane Mesic

This area consists of 170 ac (69 ha) of State land, and 134 ac (54 ha) of privately owned land, at the upper reaches of Papalaua and Pohakea gulches on the southeastern slopes of west Maui. These units include the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the montane mesic ecosystem (see Table 4). They are occupied by the plants *Remya mauiensis* and *Santalum haleakalae* var. *lanaiense,* and contain unoccupied habitat that is essential to the conservation of these species by providing the PCEs necessary for the expansion of the existing wild populations. Although Maui—Montane Mesic—Unit 5 is not known to be occupied by the plants *Ctenitis squamigera, Cyanea magnicalyx, Diplazium molokaiense, Geranium hillebrandii, Huperzia mannii, Lysimachia lydgatei, Stenogyne kauaulaensis,* or *Zanthoxylum hawaiiense;* or by the forest birds, the akohekohe (*Palmeria dolei*) and kiwikiu (*Pseudonestor xanthophrys*), we have determined this area to be essential for the conservation and recovery of these montane mesic species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Maui—Montane Mesic—Unit 6 (and)

Palmeria dolei—Unit 23—Montane Mesic (and)

Pseudonestor xanthophrys—Unit 23—Montane Mesic

This area consists of 94 ac (38 ha) of privately owned land at Kapilau Ridge on the eastern slopes of west Maui. These units include the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the montane mesic ecosystem (see Table 4). Although Maui—Montane Mesic—Unit 6 is not currently occupied by the plants *Ctenitis squamigera, Cyanea magnicalyx, Diplazium molokaiense, Geranium hillebrandii, Huperzia mannii, Lysimachia lydgatei, Remya mauiensis, Santalum haleakalae* var. *lanaiense, Stenogyne kauaulaensis,* or *Zanthoxylum hawaiiense;* or by the forest birds, the akohekohe (*Palmeria dolei*) and kiwikiu (*Pseudonestor xanthophrys*), we have determined this area to be essential for the conservation and recovery of these montane mesic species because it provides the PCEs necessary for the reestablishment of wild populations within the historical ranges of the species. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Maui—Montane Dry—Unit 1 consists of 2,962 ac (1,199 ha) of State land, 1,703 ac (689 ha) of privately owned land, and 323 ac (131 ha) of federally owned land (Haleakala National Park), from Kanaio to Naholoku and Kaupo Gap along the southern slopes of east Maui. This unit includes the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the montane dry ecosystem (see Table 4). It is occupied by the plants *Melicope knudsenii, Santalum haleakalae* var. *lanaiense,* and *Zanthoxylum hawaiiense,* and contains unoccupied habitat that is essential to the conservation of these species by providing the PCEs necessary for the expansion of the existing wild populations. Although Maui—Montane Dry—Unit 1 is not known to be occupied by the plants *Alectryon macrococcus, Geranium arboreum,* or *Melicope mucronulata,* we have determined this area to be essential for the conservation and recovery of these montane dry species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Maui—Subalpine—Unit 1 (and)

Palmeria dolei—Unit 24—Subalpine (and)

Pseudonestor xanthophrys—Unit 24—Subalpine

This area consists of 10,866 ac (4,397 ha) of State land, 5,764 ac (2,333 ha) of privately owned land, and 2,770 ac (1,121 ha) of federally owned land (Haleakala National Park), from Kanaio north to Puu Nianiau and east to Kaupo Gap on east Maui. These units include the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the subalpine ecosystem (see Table 4). They are occupied by the plants *Asplenium peruvianum* var. *insulare, Bidens micrantha* ssp. *kalealaha,* and *Geranium arboreum;* and by the forest birds, the akohekohe (*Palmeria dolei*) and kiwikiu (*Pseudonestor xanthophrys*). These units also contain unoccupied habitat that is essential to the conservation of these species by providing the PCEs necessary for the expansion of the existing wild populations. Although Maui—Subalpine—Unit 1 is not known to be occupied by the plants *Argyroxiphium sandwicense* ssp. *macrocephalum, Geranium multiflorum, Phyllostegia bracteata, Schiedea haleakalensis, Solanum incompletum,* or *Zanthoxylum hawaiiense,* we have determined this area to be essential for the conservation and recovery of these subalpine species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Maui—Subalpine—Unit 2 (and)

Palmeria dolei—Unit 25—Subalpine (and)

Pseudonestor xanthophrys—Unit 25—Subalpine

This area consists of 1,095 ac (443 ha) of privately owned land, and 9,836 ac (3,981 ha) of federally owned land (Haleakala National Park), from the

summit north to Koolau Gap and east to Kalapawili Ridge on east Maui. These units include the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the subalpine ecosystem (see Table 4). They are occupied by the plants *Argyroxiphium sandwicense* ssp. *macrocephalum, Geranium multiflorum,* and *Schiedea haleakalensis;* and by the forest bird, the akohekohe (*Palmeria dolei*). These units also contain unoccupied habitat that is essential to the conservation of these species by providing the PCEs necessary for the expansion of the existing wild populations. Although Maui—Subalpine—Unit 2 is not known to be occupied by the plants *Asplenium peruvianum* var. *insulare, Bidens micrantha* ssp. *kalealaha, Geranium arboreum, Phyllostegia bracteata, Solanum incompletum,* or *Zanthoxylum hawaiiense;* or by the forest bird, the kiwikiu (*Pseudonestor xanthophrys*), we have determined this area to be essential for the conservation and recovery of these subalpine species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Maui—Alpine—Unit 1 consists of 761 ac (308 ha) of State land, 428 ac (173 ha) of privately owned land, and 918 ac (371 ha) of federally owned land (Haleakala National Park), at the summit of Haleakala on east Maui. This unit includes the mixed herbland and shrubland, the moisture regime, and the subcanopy native plant species identified as physical or biological features in the alpine ecosystem (see Table 4). It is occupied by the plant *Argyroxiphium sandwicense* ssp. *macrocephalum,* and contains unoccupied areas we have determined to be essential for the conservation and recovery of this alpine species because it provides the PCEs necessary for the reestablishment of wild populations within its historical range. Due to its small numbers of individuals and low population sizes, this species requires suitable habitat and space for expansion or reintroduction to achieve population levels that could approach recovery.

Maui—Dry Cliff—Unit 1 (and)

Palmeria dolei—Unit 26—Dry Cliff (and)

Pseudonestor xanthophrys—Unit 26—Dry Cliff

This area consists of 264 ac (107 ha) of privately owned land and 755 ac (305 ha) of federally owned land (Haleakala National Park), from Pakaoao to Koolau Gap on east Maui. These units include the mixed herbland and shrubland, the moisture regime, and the subcanopy and understory native plant species identified as physical or biological features in the dry cliff ecosystem (see Table 4). They are occupied by the plant *Bidens campylotheca* ssp. *pentamera,* and contain unoccupied habitat that is essential to the conservation of this species by providing the PCEs necessary for the expansion of the existing wild populations. Although Maui—Dry Cliff—Unit 1 is not known to be occupied by the plants *Diplazium molokaiense, Plantago princeps,* or *Schiedea haleakalensis;* or by the forest birds, the akohekohe (*Palmeria dolei*) and kiwikiu (*Pseudonestor xanthophrys*), we have determined this area to be essential for the conservation and recovery of these dry cliff species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Maui—Dry Cliff—Unit 2 consists of 688 ac (279 ha) of federally owned land (Haleakala National Park) from Haupaakea Peak to Kaupo Gap on east Maui. This unit includes the mixed herbland and shrubland, the moisture regime, and the subcanopy and understory native plant species identified as physical or biological features in the dry cliff ecosystem (see Table 4). It is occupied by the plants *Plantago princeps* and *Schiedea haleakalensis,* and contains unoccupied habitat that is essential to the conservation of these species by providing the PCEs necessary for the expansion of the existing wild populations. Although Maui—Dry Cliff—Unit 2 is not known to be occupied by the plants *Bidens campylotheca* ssp. *pentamera* or *Diplazium molokaiense,* we have determined this area to be essential for the conservation and recovery of these dry cliff species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Maui—Dry Cliff—Unit 3 (and)

Palmeria dolei—Unit 27—Dry Cliff (and)

Pseudonestor xanthophrys—Unit 27—Dry Cliff

This area consists of 93 ac (38 ha) of privately owned land and 200 ac (81 ha) of federally owned land (Haleakala National Park) on the eastern wall of Koolau Gap on east Maui. These units include the mixed herbland and shrubland, the moisture regime, and the subcanopy and understory native plant species identified as physical or biological features in the dry cliff ecosystem (see Table 4). Although Maui—Dry Cliff—Unit 3 is not currently occupied by the plants *Bidens campylotheca* ssp. *pentamera, Diplazium molokaiense, Plantago princeps,* or *Schiedea haleakalensis;* or by the forest birds, the akohekohe (*Palmeria dolei*) and kiwikiu (*Pseudonestor xanthophrys*), we have determined this area to be essential for the conservation and recovery of these dry cliff species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Maui—Dry Cliff—Unit 4 (and)

Palmeria dolei—Unit 28—Dry Cliff (and)

Pseudonestor xanthophrys—Unit 28—Dry Cliff

This area consists of 315 ac (127 ha) federally owned land (Haleakala National Park), along Kalapawili Ridge on east Maui. These units include the mixed herbland and shrubland, the moisture regime, and the subcanopy and understory native plant species identified as physical or biological features in the dry cliff ecosystem (see Table 4). Although Maui—Dry Cliff—Unit 4 is not currently occupied by the plants *Bidens campylotheca* ssp. *pentamera, Diplazium molokaiense, Plantago princeps,* or *Schiedea haleakalensis;* or by the forest birds, the akohekohe (*Palmeria dolei*) and kiwikiu (*Pseudonestor xanthophrys*), we have determined this area to be essential for the conservation and recovery of these

dry cliff species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Maui—Dry Cliff—Unit 5 (and)

Palmeria dolei—Unit 29—Dry Cliff (and)

Pseudonestor xanthophrys—Unit 29—Dry Cliff

This area consists of 1,298 ac (525 ha) of State land, and 238 ac (96 ha) of privately owned land, from Helu and across Olowalu to Ukumehame Gulch, on west Maui. These units include the mixed herbland and shrubland, the moisture regime, and the subcanopy and understory native plant species identified as physical or biological features in the dry cliff ecosystem (see Table 4). Although Maui—Dry Cliff—Unit 5 is not currently occupied by the plants *Bonamia menziesii, Diplazium molokaiense, Hesperomannia arbuscula, Isodendrion pyrifolium, Kadua laxiflora, Neraudia sericea,* or *Tetramolopium capillare;* or by the forest birds, the akohekohe (*Palmeria dolei*) and kiwikiu (*Pseudonestor xanthophrys*), we have determined this area to be essential for the conservation and recovery of these dry cliff species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Maui—Dry Cliff—Unit 6 consists of 279 ac (113 ha) of State land along the east wall of Ukumehame Gulch on west Maui. This unit includes the mixed herbland and shrubland, the moisture regime, and the subcanopy and understory native plant species identified as physical or biological features in the dry cliff ecosystem (see Table 4). Although Maui—Dry Cliff—Unit 6 is not currently occupied by the plants *Bonamia menziesii, Diplazium molokaiense, Hesperomannia arbuscula, Isodendrion pyrifolium, Kadua laxiflora, Neraudia sericea,* or *Tetramolopium capillare,* we have determined this area to be essential for the conservation and recovery of these dry cliff species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Maui—Dry Cliff—Unit 7 consists of 808 ac (327 ha) of privately owned land at Waikapu Valley on west Maui. This unit includes the mixed herbland and shrubland, the moisture regime, and the subcanopy and understory native plant species identified as physical or biological features in the dry cliff ecosystem (see Table 4). Although Maui—Dry Cliff—Unit 7 is not currently occupied by the plants *Bonamia menziesii, Diplazium molokaiense, Hesperomannia arbuscula, Isodendrion pyrifolium, Kadua laxiflora, Neraudia sericea,* or *Tetramolopium capillare,* we have determined this area to be essential for the conservation and recovery of these dry cliff species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Maui—Wet Cliff—Unit 1 (and)

Palmeria dolei—Unit 30—Wet Cliff (and)

Pseudonestor xanthophrys—Unit 30—Wet Cliff

This area consists of 460 ac (186 ha) of privately owned land from upper Haiku Uka to Keanae Valley on the northern slopes of east Maui. These units include the mixed herbland and shrubland, the moisture regime, and the subcanopy and understory native plant species identified as physical or biological features in the wet cliff ecosystem (see Table 4). They are occupied by the plants *Bidens campylotheca* ssp. *pentamera* and *Cyanea horrida,* and by the forest bird, the kiwikiu (*Pseudonestor xanthophrys*). These units also contain unoccupied habitat that is essential to the conservation of these species by providing the PCEs necessary for the expansion of the existing wild populations. Although Maui—Wet Cliff—Unit 1 is not known to be occupied by the plants *Bidens campylotheca* ssp. *waihoiensis, Cyanea copelandii* ssp. *haleakalaensis, Melicope ovalis, Phyllostegia bracteata, P. haliakalae,* or *Plantago princeps;* or by the forest bird, the akohekohe (*Palmeria dolei*), we have determined this area to be essential for the conservation and recovery of these wet cliff species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Maui—Wet Cliff—Unit 2 (and)

Palmeria dolei—Unit 31—Wet Cliff (and)

Pseudonestor xanthophrys—Unit 31—Wet Cliff

This area consists of 475 ac (192 ha) of State land, 20 ac (8 ha) of privately owned land, and 912 ac (369 ha) of federally owned land (Haleakala National Park), from Kalapawili Ridge along Kipahulu Valley and north to Puuhoolio, on the northeastern slopes of east Maui. These units include the mixed herbland and shrubland, the moisture regime, and the subcanopy and understory native plant species identified as physical or biological features in the wet cliff ecosystem (see Table 4). They are occupied by the plants *Bidens campylotheca* ssp. *pentamera, B. campylotheca* ssp. *waihoiensis, Cyanea copelandii* ssp. *haleakalaensis, Melicope ovalis,* and *Plantago princeps.* These units also contains unoccupied habitat that is essential to the conservation of these species by providing the PCEs necessary for the expansion of the existing wild populations. Although Maui—Wet Cliff—Unit 2 is not known to be occupied by the plants *Cyanea horrida, Phyllostegia bracteata,* or *P. haliakalae;* or by the forest birds, the akohekohe (*Palmeria dolei*) and kiwikiu (*Pseudonestor xanthophrys*), we have determined this area to be essential for the conservation and recovery of these wet cliff species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Maui—Wet Cliff—Unit 3 (and)

Palmeria dolei—Unit 32—Wet Cliff (and)

Pseudonestor xanthophrys—Unit 32—Wet Cliff

This area consists of 5 ac (2 ha) of State land and 433 ac (175 ha) federally owned land (Haleakala National Park) along the south rim of Kipahulu Valley on east Maui. These units include the

mixed herbland and shrubland, the moisture regime, and the subcanopy and understory native plant species identified as physical or biological features in the wet cliff ecosystem (see Table 4). Although Maui—Wet Cliff—Unit 3 is not currently occupied by the plants *Bidens campylotheca* ssp. *pentamera, B. campylotheca* ssp. *waihoiensis, Cyanea copelandii* ssp. *haleakalaensis, C. horrida, Melicope ovalis, Phyllostegia bracteata, P. haliakalae,* or *Plantago princeps;* or by the forest birds, the akohekohe (*Palmeria dolei*) and kiwikiu (*Pseudonestor xanthophrys*), we have determined this area to be essential for the conservation and recovery of these wet cliff species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Maui—Wet Cliff—Unit 4 (and)

Palmeria dolei—Unit 33—Wet Cliff (and)

Pseudonestor xanthophrys—Unit 33—Wet Cliff

This area consists of 184 ac (75 ha) of State land along the north wall of Waihoi Valley, on the northeastern slopes of east Maui. These units include the mixed herbland and shrubland, the moisture regime, and the subcanopy and understory native plant species identified as physical or biological features in the wet cliff ecosystem (see Table 4). They are occupied by the plant *Bidens campylotheca* ssp. *waihoiensis,* and contain unoccupied habitat that is essential to the conservation of this species by providing the PCEs necessary for the expansion of the existing wild populations. Although Maui—Wet Cliff—Unit 4 is not known to be occupied by the plants *Bidens campylotheca* ssp. *pentamera, Cyanea copelandii* ssp. *haleakalaensis, C. horrida, Melicope ovalis, Phyllostegia bracteata, P. haliakalae,* or *Plantago princeps;* or by the forest birds, the akohekohe (*Palmeria dolei*) and kiwikiu (*Pseudonestor xanthophrys*), we have determined this area to be essential for the conservation and recovery of these wet cliff species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Maui—Wet Cliff—Unit 5 (and)

Palmeria dolei—Unit 34—Wet Cliff (and)

Pseudonestor xanthophrys—Unit 34—Wet Cliff

This area consists of 35 ac (14 ha) of State land and 2,013 ac (814 ha) of privately owned land, along Honokohau Stream on the north side of west Maui. These units include the mixed herbland and shrubland, the moisture regime, and the subcanopy and understory native plant species identified as physical or biological features in the wet cliff ecosystem (see Table 4). They are occupied by the plants *Bidens conjuncta, Cyanea lobata, Cyrtandra munroi,* and *Hesperomannia arborescens,* and contain unoccupied habitat that is essential to the conservation of these species by providing the PCEs necessary for the expansion of the existing wild populations. Although Maui—Wet Cliff—Unit 5 is not known to be occupied by the plants *Alectryon macrococcus, Bidens campylotheca* ssp. *pentamera, Bonamia menziesii, Ctenitis squamigera, Cyanea glabra, C. magnicalyx, Cyrtandra filipes, Dubautia plantaginea* ssp. *humilis, Gouania vitifolia, Hesperomannia arbuscula, Isodendrion pyrifolium, Kadua laxiflora, Lysimachia lydgatei, Plantago princeps, Platanthera holochila, Pteris lidgatei, Remya mauiensis, Santalum haleakalae* var. *lanaiense,* or *Tetramolopium capillare;* or by the forest birds, the akohekohe (*Palmeria dolei*) and kiwikiu (*Pseudonestor xanthophrys*), we have determined this area to be essential for the conservation and recovery of these wet cliff species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Maui—Wet Cliff—Unit 6 (and)

Palmeria dolei—Unit 35—Wet Cliff (and)

Pseudonestor xanthophrys—Unit 35—Wet Cliff

This area consists of 1,858 ac (752 ha) of State land, 2,917 ac (1,181 ha) of County land, and 4,328 ac (1,752 ha) of privately owned land, at the summit ridges of west Maui. These units include the mixed herbland and shrubland, the moisture regime, and the subcanopy and understory native plant species identified as physical or biological features in the wet cliff ecosystem (see Table 4). They are occupied by the plants *Alectryon macrococcus, Bidens conjuncta, Ctenitis squamigera, Cyanea magnicalyx, Cyrtandra filipes, C. munroi, Dubautia plantaginea* ssp. *humilis, Hesperomannia arborescens, Kadua laxiflora, Lysimachia lydgatei, Plantago princeps, Platanthera holochila, Pteris lidgatei, Remya mauiensis,* and *Santalum haleakalae* var. *lanaiense.* These units also contain unoccupied habitat that is essential to the conservation of these species by providing the PCEs necessary for the expansion of the existing wild populations. Although Maui—Wet Cliff—Unit 6 is not known to be occupied by the plants *Bidens campylotheca* ssp. *pentamera, Bonamia menziesii, Cyanea glabra, Cyanea lobata, Gouania vitifolia, Hesperomannia arbuscula, Isodendrion pyrifolium,* or *Tetramolopium capillare;* or by the forest birds, the akohekohe (*Palmeria dolei*) and kiwikiu (*Pseudonestor xanthophrys*), we have determined this area to be essential for the conservation and recovery of these wet cliff species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Maui—Wet Cliff—Unit 7 (and)

Palmeria dolei—Unit 36—Wet Cliff (and)

Pseudonestor xanthophrys—Unit 36—Wet Cliff

This area consists of 557 ac (225 ha) of State land and 224 ac (91 ha) of privately owned land, along Kapaloa and Amalu streams on the northwestern side of west Maui. These units include the mixed herbland and shrubland, the moisture regime, and the subcanopy and understory native plant species identified as physical or biological features in the wet cliff ecosystem (see Table 4). They are occupied by the plants *Alectryon macrococcus, Bonamia menziesii, Ctenitis squamigera, Cyrtandra filipes, C. munroi,* and *Platanthera holochila,* and contain unoccupied habitat that is essential to the conservation of these species by providing the PCEs necessary for the expansion of the existing wild populations. Although Maui—Wet Cliff—Unit 7 is not known to be occupied by the plants *Bidens*

campylotheca ssp. *pentamera, B. conjuncta, Cyanea glabra, C. lobata, C. magnicalyx, Dubautia plantaginea* ssp. *humilis, Gouania vitifolia, Hesperomannia arborescens, H. arbuscula, Isodendrion pyrifolium, Kadua laxiflora, Lysimachia lydgatei, Plantago princeps, Pteris lidgatei, Remya mauiensis, Santalum haleakalae* var. *lanaiense,* or *Tetramolopium capillare;* or by the forest birds, the akohekohe (*Palmeria dolei*) and kiwikiu (*Pseudonestor xanthophrys*), we have determined this area to be essential for the conservation and recovery of these wet cliff species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Maui—Wet Cliff—Unit 8 consists of 337 ac (137 ha) of State land along Kahakuloa Stream on the north side of west Maui. This unit includes the mixed herbland and shrubland, the moisture regime, and the subcanopy and understory native plant species identified as physical or biological features in the wet cliff ecosystem (see Table 4). It is occupied by the plant *Cyrtandra filipes,* and contains unoccupied habitat that is essential to the conservation of this species by providing the PCEs necessary for the expansion of the existing wild populations. Although Maui—Wet Cliff—Unit 8 is not known to be occupied by the plants *Alectryon macrococcus, Bidens campylotheca* ssp. *pentamera, B. conjuncta, Bonamia menziesii, Ctenitis squamigera, Cyanea glabra, C. lobata, C. magnicalyx, Cyrtandra munroi, Dubautia plantaginea* ssp. *humilis, Gouania vitifolia, Hesperomannia arborescens, H. arbuscula, Isodendrion pyrifolium, Kadua laxiflora, Lysimachia lydgatei, Plantago princeps, Platanthera holochila, Pteris lidgatei, Remya mauiensis, Santalum haleakalae* var. *lanaiense,* or *Tetramolopium capillare,* we have determined this area to be essential for the conservation and recovery of these wet cliff species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Kahoolawe—Coastal—Unit 1 consists of 1,515 ac (613 ha) of State land from Kaneloa to Lae o Kaule, including Aleale, along the southern and eastern coast of Kahoolawe. It is occupied by the plant *Kanaloa kahoolawensis* and includes the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the coastal ecosystem (see Table 4). This unit also contains unoccupied habitat that is essential to the conservation of this species by providing the PCEs necessary for the expansion of the existing wild populations. Although Kahoolawe—Coastal—Unit 1 is not known to be occupied by the plants *Sesbania tomentosa* or *Vigna o-wahuensis,* we have determined this area to be essential for the conservation and recovery of these coastal species because it provides the physical or biological features necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Kahoolawe—Coastal—Unit 2 consists of 12 ac (5 ha) of State land on Puukoae, an islet off the southern coast of Kahoolawe. It is occupied by the plant *Sesbania tomentosa* and includes the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the coastal ecosystem (see Table 4). This unit also contains unoccupied habitat that is essential to the conservation of this species by providing the PCEs necessary for the expansion of the existing wild populations. Although Kahoolawe—Coastal—Unit 2 is not known to be occupied by *Kanaloa kahoolawensis* or *Vigna o-wahuensis,* we have determined this area to be essential for the conservation and recovery of these coastal species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Kahoolawe—Coastal—Unit 3 consists of 339 ac (137 ha) of State land from Laepaki to Puhianenue along the western coast of Kahoolawe. This unit includes the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the coastal ecosystem (see Table 4). Although Kahoolawe—Coastal—Unit 3 is not known to be occupied by *Kanaloa kahoolawensis, Sesbania tomentosa,* or *Vigna o-wahuensis,* we have determined this area to be essential for the conservation and recovery of these coastal species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Kahoolawe—Lowland Dry—Unit 1 consists of 1,380 ac (559 ha) of State land, north of Waihonu Gulch on west Kahoolawe. This unit includes the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the lowland dry ecosystem (see Table 4). Although Kahoolawe—Lowland Dry—Unit 1 is not known to be occupied by *Gouania hillebrandii, Hibiscus brackenridgei, Kanaloa kahoolawensis, Neraudia sericea, Sesbania tomentosa,* or *Vigna o-wahuensis,* we have determined this area to be essential for the conservation and recovery of these lowland dry species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Kahoolawe—Lowland Dry—Unit 2 consists of 3,205 ac (1,297 ha) of State land from Lua o Kealialuna to Puu o Moaulaiki and Luamakika on the eastern side of Kahoolawe. This unit includes the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the lowland dry ecosystem (see Table 4). Although Kahoolawe—Lowland Dry—Unit 2 is not known to be occupied by *Gouania hillebrandii, Hibiscus brackenridgei, Kanaloa kahoolawensis, Neraudia sericea, Sesbania tomentosa,* or *Vigna o-wahuensis,* we have determined this area to be essential for the conservation and recovery of these lowland dry species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat

and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Lanai—Coastal—Unit 1 consists of 373 ac (151 ha) of privately owned land, from Huawai Bay to Kapihaa Bay on the southern coast of Lanai. This unit includes the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the coastal ecosystem (see Table 4). Although Lanai—Coastal—Unit 1 is not known to be occupied by *Canavalia pubescens, Hibiscus brackenridgei, Portulaca sclerocarpa,* or *Sesbania tomentosa,* we have determined this area to be essential for the conservation and recovery of these coastal species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Lanai—Coastal—Unit 2 consists of 2 ac (1 ha) on Poopoo islet off of the southern coast of Lanai, and is classified as a State Seabird Sanctuary. This unit includes the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the coastal ecosystem (see Table 4). Although Lanai—Coastal—Unit 2 is not known to be occupied by *Canavalia pubescens, Hibiscus brackenridgei, Portulaca sclerocarpa,* or *Sesbania tomentosa,* we have determined this area to be essential for the conservation and recovery of these coastal species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Lanai—Coastal—Unit 3 consists of 509 ac (206 ha) of privately owned land, from Laehi to Nahoko on the northeastern coast of Lanai. This unit includes the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the coastal ecosystem (see Table 4). Although Lanai—Coastal—Unit 3 is not known to be occupied by *Canavalia pubescens, Hibiscus brackenridgei, Portulaca sclerocarpa,* or *Sesbania tomentosa,* we have determined this area to be essential for the conservation and recovery of these coastal species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Lanai—Lowland Dry—Unit 1 consists of 9,766 ac (3,952 ha) of privately owned land, from Maunalei Gulch to Puumahanalua, along the northeastern and southeastern slopes of Lanai. This unit includes the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the lowland dry ecosystem (see Table 4). It is occupied by the plants *Abutilon eremitopetalum, Schenkia sebaeoides,* and *Spermolepis hawaiiensis,* and contains unoccupied habitat that is essential to the conservation of these species by providing the PCEs necessary for the expansion of the existing wild populations. Although Lanai—Lowland Dry—Unit 1 is not known to be occupied by the plants *Asplenium dielerectum, Bidens micrantha* ssp. *kalealaha, Cyperus fauriei, C. trachysanthos, Hibiscus brackenridgei, Neraudia sericea, Pleomele fernaldii, Sesbania tomentosa, Silene lanceolata, Solanum incompletum, Tetramolopium lepidotum* ssp. *lepidotum, T. remyi,* or *Vigna o-wahuensis,* we have determined this area to be essential for the conservation and recovery of these lowland dry species because it provides the physical or biological features necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Lanai—Lowland Dry—Unit 2 consists of 939 ac (380 ha) of privately owned land, south of Paliamano Gulch on the western slopes of Lanai. This unit includes the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the lowland dry ecosystem (see Table 4). Although Lanai—Lowland Dry—Unit 2 is not known to be occupied by the plants *Abutilon eremitopetalum, Asplenium dielerectum, Bidens micrantha* ssp. *kalealaha, Cyperus fauriei, C. trachysanthos, Hibiscus brackenridgei, Neraudia sericea, Pleomele fernaldii, Schenkia sebaeoides, Sesbania tomentosa, Silene lanceolata, Solanum incompletum, Spermolepis hawaiiensis, Tetramolopium lepidotum* ssp. *lepidotum, T. remyi,* or *Vigna o-wahuensis,* we have determined this area to be essential for the conservation and recovery of these lowland dry species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Lanai—Lowland Mesic—Unit 1 consists of 3 ac (1 ha) of County land and 11,170 ac (4,520 ha) of privately owned land, from Kanepuu south to Awehi and north to Kauiki, along the central ridges of Lanai. This unit includes the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the lowland mesic ecosystem (see Table 4). It is occupied by the plants *Bidens micrantha* ssp. *kalealaha, Bonamia menziesii, Pleomele fernaldii, Santalum haleakalae* var. *lanaiense,* and *Spermolepis hawaiiensis,* and contains unoccupied habitat that is essential to the conservation of these species by providing the PCEs necessary for the expansion of the existing wild populations. Although Lanai—Lowland Mesic—Unit 1 is not known to be occupied by the plants *Cenchrus agrimonioides, Clermontia oblongifolia* ssp. *mauiensis, Diplazium molokaiense, Kadua cordata* ssp. *remyi, K. laxiflora, Labordia tinifolia* var. *lanaiensis, Solanum incompletum,* or *Vigna o-wahuensis,* we have determined this area to be essential for the conservation and recovery of these lowland mesic species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Lanai—Lowland Wet—Unit 1

Partulina semicarinata—Unit 1—Lowland Wet

Partulina variabilis—Unit 1—Lowland Wet

This area consists of 374 ac (152 ha) of privately owned land, from upper Hulopoe and Kaiholena gulches to Puuaalii in central Lanai. These units include the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the lowland wet ecosystem (see Table 4). They are occupied by the plants *Kadua cordata* ssp. *remyi, Pleomele fernaldii,* and *Santalum haleakalae* var. *lanaiense;* and by the Lanai tree snails *Partulina semicarinata* and *P. variabilis,* and contain unoccupied habitat that is essential to the conservation of these species by providing the PCEs necessary for the expansion of the existing wild populations. Although Lanai—Lowland Wet—Unit 1 is not known to be occupied by the plants *Clermontia oblongifolia* ssp. *mauiensis, Kadua laxiflora, Labordia tinifolia* var. *lanaiensis,* or *Zanthoxylum hawaiiense,* we have determined this area to be essential for the conservation and recovery of these lowland wet species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Lanai—Lowland Wet—Unit 2

Partulina semicarinata—Unit 2—Lowland Wet

Partulina variabilis—Unit 2—Lowland Wet

This area consists of 232 ac (94 ha) of privately owned land, just below the cliffs of Lanaihale, in central Lanai. These units include the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the lowland wet ecosystem (see Table 4). They are occupied by the plants *Pleomele fernaldii* and *Santalum haleakalae* var. *lanaiense,* and contain unoccupied habitat that is essential to the conservation of these species by providing the PCEs necessary for the expansion of the existing wild populations. Although Lanai—Lowland Wet—Unit 2 is not known to be occupied by the plants *Clermontia oblongifolia* ssp. *mauiensis, Kadua cordata* ssp. *remyi, K. laxiflora, Labordia tinifolia* var. *lanaiensis,* or *Zanthoxylum hawaiiense;* or by the Lanai tree snails *Partulina semicarinata* and *P. variabilis,* we have determined this area to be essential for the conservation and recovery of these lowland wet species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Lanai—Montane Wet—Unit 1

Partulina semicarinata—Unit 3—Montane Wet

Partulina variabilis—Unit 3—Montane Wet

This area consists of 248 ac (101 ha) of privately owned land, from Puuallii across the summit to Lanaihale and Waiakeakua, in central Lanai. These units include the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the montane wet ecosystem (see Table 4). They are occupied by the plants *Cyanea gibsonii, C. lobata, Cyrtandra munroi, Kadua laxiflora, Melicope munroi, Santalum haleakalae* var. *lanaiense,* and *Viola lanaiensis;* and by the Lanai tree snails *Partulina semicarinata* and *P. variabilis.* These units also contain unoccupied habitat that is essential to the conservation of these species by providing the PCEs necessary for the expansion of the existing wild populations. Although Lanai—Montane Wet—Unit 1 is not known to be occupied by the plants *Adenophorus periens* or *Labordia tinifolia* var. *lanaiensis,* we have determined this area to be essential for the conservation and recovery of these montane wet species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Lanai—Dry Cliff—Unit 1 consists of 83 ac (34 ha) of privately owned land at Kaiholena Gulch in central Lanai. This unit includes the mixed herbland and shrubland, the moisture regime, and the subcanopy and understory native plant species identified as physical or biological features in the dry cliff ecosystem (see Table 4). Although Lanai—Dry Cliff—Unit 1 is not known to be occupied by the plants *Asplenium dielerectum, Bidens micrantha* ssp. *kalealaha, Brighamia rockii, Ctenitis squamigera, Diplazium molokaiense, Neraudia sericea, Phyllostegia haliakalae, Pleomele fernaldii, Solanum incompletum,* or *Viola lanaiensis,* we have determined this area to be essential for the conservation and recovery of these dry cliff species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Lanai—Dry Cliff—Unit 2 consists of 354 ac (143 ha) of privately owned land, at upper Maunalei Gulch in central Lanai. This unit includes the mixed herbland and shrubland, the moisture regime, and the subcanopy and understory native plant species identified as physical or biological features in the dry cliff ecosystem (see Table 4). It is occupied by the plant *Pleomele fernaldii,* and contains unoccupied habitat that is essential to the conservation of this species by providing the PCEs necessary for the expansion of the existing wild populations. Although Lanai—Dry Cliff—Unit 2 is not known to be occupied by the plants *Asplenium dielerectum, Bidens micrantha* ssp. *kalealaha, Brighamia rockii, Ctenitis squamigera, Diplazium molokaiense, Neraudia sericea, Phyllostegia haliakalae, Solanum incompletum,* or *Viola lanaiensis,* we have determined this area to be essential for the conservation and recovery of these dry cliff species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Lanai—Dry Cliff—Unit 3 consists of 398 ac (161 ha) of privately owned land at upper Hauola Gulch in central Lanai. This unit includes the mixed herbland and shrubland, the moisture regime, and the subcanopy and understory native plant species identified as physical or biological features in the dry cliff ecosystem (see Table 4). Although Lanai—Dry Cliff—Unit 3 is not known to be occupied by the plants *Asplenium*

dielerectum, Bidens micrantha ssp. *kalealaha, Brighamia rockii, Ctenitis squamigera, Diplazium molokaiense, Neraudia sericea, Phyllostegia haliakalae, Pleomele fernaldii, Solanum incompletum,* or *Viola lanaiensis,* we have determined this area to be essential for the conservation and recovery of these dry cliff species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Lanai—Wet Cliff—Unit 1

Partulina semicarinata—Unit 4—Wet Cliff

Partulina variabilis—Unit 4—Wet Cliff

This area consists of 731 ac (296 ha) of privately owned land, from Waialaia and Kunoa gulches to Puukole, in central Lanai. These units include the mixed herbland and shrubland, the moisture regime, and the subcanopy and understory native plant species identified as physical or biological features in the wet cliff ecosystem (see Table 4). They are occupied by the plants *Ctenitis squamigera, Cyrtandra munroi, Melicope munroi, Pleomele fernaldii,* and *Santalum haleakalae* var. *lanaiense;* and by the Lanai tree snails *Partulina semicarinata* and *P. variabilis.* These units also contain unoccupied habitat that is essential to the conservation of these species by providing the PCEs necessary for the expansion of the existing wild populations. Although Lanai—Wet Cliff—Unit 1 is not known to be occupied by the plants *Cyanea gibsonii, C. munroi, Hesperomannia arborescens, Kadua laxiflora, Labordia tinifolia* var. *lanaiensis, Phyllostegia haliakalae,* or *Viola lanaiensis,* we have determined this area to be essential for the conservation and recovery of these wet cliff species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Lanai—Wet Cliff—Unit 2

Partulina semicarinata—Unit 5—Wet Cliff

Partulina variabilis—Unit 5—Wet Cliff

This area consists of 230 ac (93 ha) of privately owned land, from Kehewai Ridge to Haalelepaakai and Waiakeakua, in central Lanai. These units include the mixed herbland and shrubland, the moisture regime, and the subcanopy and understory native plant species identified as physical or biological features in the wet cliff ecosystem (see Table 4). They are occupied by the plants *Cyanea munroi, Labordia tinifolia* var. *lanaiensis, Pleomele fernaldii,* and *Santalum haleakalae* var. *lanaiense,* and contain unoccupied habitat that is essential to the conservation of these species by providing the PCEs necessary for the expansion of the existing wild populations. Although Lanai—Wet Cliff—Unit 2 is not known to be occupied by the plants *Ctenitis squamigera, Cyanea gibsonii, Cyrtandra munroi, Hesperomannia arborescens, Kadua laxiflora, Melicope munroi, Phyllostegia haliakalae,* or *Viola lanaiensis;* or by the Lanai tree snails *Partulina semicarinata* and *P. variabilis,* we have determined this area to be essential for the conservation and recovery of these wet cliff species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Molokai—Coastal—Unit 1 consists of 195 ac (79 ha) of privately owned land, and 54 ac (22 ha) of federally owned land (U.S. Coast Guard) at Laau Point, from Kahaiawa to Keawakalani, along the western coast of Molokai. This unit is occupied by the plant *Marsilea villosa,* and includes the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the coastal ecosystem (see Table 4). This unit also contains unoccupied habitat that is essential to the conservation of this species by providing the PCEs necessary for the expansion of the existing wild populations. Although Molokai—Coastal—Unit 1 is not known to be occupied by *Bidens wiebkei, Brighamia rockii, Canavalia molokaiensis, Hibiscus arnottianus* ssp. *immaculatus, H. brackenridgei, Ischaemum byrone, Peucedanum sandwicense, Pittosporum halophilum, Schenkia sebaeoides, Sesbania tomentosa,* or *Tetramolopium rockii,* we have determined this area to be essential for the conservation and recovery of these coastal species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Molokai—Coastal—Unit 2 consists of 1,032 ac (418 ha) of State land, and 2,511 ac (1,016 ha) of privately owned land (partly within The Nature Conservancy's Moomomi Preserve), from Ilio Point to Nenehanaupo, along the northwestern coast of Molokai. This unit is occupied by the plants *Marsilea villosa, Schenkia sebaeoides, Sesbania tomentosa,* and *Tetramolopium rockii,* and includes the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the coastal ecosystem (see Table 4). This unit also contains unoccupied habitat that is essential to the conservation of these species by providing the PCEs necessary for the expansion of the existing wild populations. Although Molokai—Coastal—Unit 2 is not known to be occupied by *Bidens wiebkei, Brighamia rockii, Canavalia molokaiensis, Hibiscus arnottianus* ssp. *immaculatus, H. brackenridgei, Ischaemum byrone, Peucedanum sandwicense,* or *Pittosporum halophilum,* we have determined this area to be essential for the conservation and recovery of these coastal species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Molokai—Coastal—Unit 3 consists of 859 ac (348 ha) of State land, less than 1 acre (ha) of privately owned land, and 3 ac (1 ha) of federally owned land (Kalaupapa National Historical Park), from Kahiu Point to Wainene, along the north-central coast of Molokai. This unit is occupied by the plants *Canavalia molokaiensis, Pittosporum halophilum, Schenkia sebaeoides,* and *Tetramolopium rockii,* and includes the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant

species identified as physical or biological features in the coastal ecosystem (see Table 4). This unit also contains unoccupied habitat that is essential to the conservation of these species by providing the PCEs necessary for the expansion of the existing wild populations. Although Molokai—Coastal—Unit 3 is not known to be occupied by *Bidens wiebkei, Brighamia rockii, Hibiscus arnottianus* ssp. *immaculatus, H. brackenridgei, Ischaemum byrone, Marsilea villosa, Peucedanum sandwicense,* or *Sesbania tomentosa,* we have determined this area to be essential for the conservation and recovery of these coastal species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Molokai—Coastal—Unit 4 consists of 10 ac (4 ha) on Mokapu Island on the northern coast of Molokai. This area is State-owned, and is classified as a State Seabird Sanctuary. This unit is occupied by the plants *Peucedanum sandwicense* and *Pittosporum halophilum,* and includes the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the coastal ecosystem (see Table 4). This unit also contains unoccupied habitat that is essential to the conservation of these species by providing the PCEs necessary for the expansion of the existing wild populations. Although Molokai—Coastal—Unit 4 is not known to be occupied by *Bidens wiebkei, Brighamia rockii, Canavalia molokaiensis, Hibiscus arnottianus* ssp. *immaculatus, H. brackenridgei, Ischaemum byrone, Marsilea villosa, Sesbania tomentosa, Schenkia sebaeoides,* or *Tetramolopium rockii,* we have determined this area to be essential for the conservation and recovery of these coastal species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Molokai—Coastal—Unit 5 consists of 1 ac (0.5 ha) on Huelo islet on the northern coast of Molokai. This area is State-owned, and is classified as a State Seabird Sanctuary. This unit is occupied by the plants *Brighamia rockii* and *Pittosporum halophilum,* and includes the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the coastal ecosystem (see Table 4). This unit also contains unoccupied habitat that is essential to the conservation of these species by providing the PCEs necessary for the expansion of the existing wild populations. Although Molokai—Coastal—Unit 5 is not known to be occupied by *Bidens wiebkei, Canavalia molokaiensis, Hibiscus arnottianus* ssp. *immaculatus, H. brackenridgei, Ischaemum byrone, Marsilea villosa, Peucedanum sandwicense, Schenkia sebaeoides, Sesbania tomentosa,* or *Tetramolopium rockii,* we have determined this area to be essential for the conservation and recovery of these coastal species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Molokai—Coastal—Unit 6 consists of 202 ac (82 ha) of State land, and 1,711 ac (692 ha) of privately owned land, from Kaholaiki Bay to Halawa Bay, on the northeastern coast of Molokai. This unit is occupied by the plants *Bidens wiebkei, Canavalia molokaiensis, Hibiscus arnottianus* ssp. *immaculatus, Ischaemum byrone,* and *Peucedanum sandwicense,* and includes the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the coastal ecosystem (see Table 4). This unit also contains unoccupied habitat that is essential to the conservation of these species by providing the PCEs necessary for the expansion of the existing wild populations. Although Molokai—Coastal—Unit 6 is not known to be occupied by *Brighamia rockii, Hibiscus brackenridgei, Marsilea villosa, Pittosporum halophilum, Schenkia sebaeoides, Sesbania tomentosa,* or *Tetramolopium rockii,* we have determined this area to be essential for the conservation and recovery of these coastal species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Molokai—Coastal—Unit 7 consists of 3 ac (1 ha) of State land and 303 ac (123 ha) of privately owned land at Alanuipuhipaka Ridge and Honokoi Gulch, on the northeastern coast of Molokai. This unit includes the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the coastal ecosystem (see Table 4). Although Molokai—Coastal—Unit 7 is not known to be occupied by *Bidens wiebkei, Brighamia rockii, Canavalia molokaiensis, Hibiscus arnottianus* ssp. *immaculatus, H. brackenridgei, Ischaemum byrone, Marsilea villosa, Peucedanum sandwicense, Pittosporum halophilum, Schenkia sebaeoides, Sesbania tomentosa,* or *Tetramolopium rockii,* we have determined this area to be essential for the conservation and recovery of these coastal species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Molokai—Lowland Dry—Unit 1 consists of 70 ac (28 ha) of privately owned land, in west-central Molokai. This unit includes the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the lowland dry ecosystem (see Table 4). Although Molokai—Lowland Dry—Unit 1 is not known to be occupied by *Bonamia menziesii, Cyperus trachysanthos, Eugenia koolauensis, Hibiscus brackenridgei, Kokia cookei,* or *Sesbania tomentosa,* we have determined this area to be essential for the conservation and recovery of these lowland dry species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Molokai—Lowland Dry—Unit 2 consists of 945 ac (383 ha) of State land, and 2,255 ac (913 ha) of privately owned land, from Kamiloloa to Makolelau, on the southern slopes of Molokai. This unit includes the mixed

herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the lowland dry ecosystem (see Table 4). Although Molokai—Lowland Dry—Unit 2 is not known to be occupied by *Bonamia menziesii, Cyperus trachysanthos, Hibiscus brackenridgei, Kokia cookei,* or *Sesbania tomentosa,* we have determined this area to be essential for the conservation and recovery of these lowland dry species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Molokai—Lowland Mesic—Unit 1 (and)

Palmeria dolei—Unit 37—Lowland Mesic (and)

Pseudonestor xanthophrys—Unit 37—Lowland Mesic

This area consists of 3,538 ac (1,432 ha) of State land, and 6,792 ac (2,749 ha) of privately owned land, from Waianui Gulch to Mapulehu, in central Molokai. These units are occupied by the plants *Alectryon macrococcus, Asplenium dielerectum, Canavalia molokaiensis, Ctenitis squamigera, Cyanea dunbariae, C. mannii, C. profuga, Cyperus fauriei, Cyrtandra filipes, Festuca molokaiensis, Gouania hillebrandii, Labordia triflora, Melicope mucronulata, Neraudia sericea, Santalum haleakalae* var. *lanaiense, Schiedea lydgatei, S. sarmentosa, Silene alexandri, S. lanceolata, Spermolepis hawaiiensis, Vigna o-wahuensis,* and *Zanthoxylum hawaiiense,* and include the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the lowland mesic ecosystem (see Table 4). These units also contain unoccupied habitat that is essential to the conservation of these species by providing the PCEs necessary for the expansion of the existing wild populations. Although Molokai—Lowland Mesic—Unit 1 is not known to be occupied by *Bonamia menziesii, Clermontia oblongifolia* ssp. *brevipes, Cyanea procera, C. solanacea, Diplazium molokaiense, Flueggea neowawraea, Isodendrion pyrifolium, Kadua laxiflora, Melicope munroi, M. reflexa, Phyllostegia haliakalae, P. mannii, P. pilosa, Sesbania tomentosa,* or *Stenogyne bifida;* or the forest birds, the akohekohe (*Palmeria dolei*) and kiwikiu (*Pseudonestor xanthophrys*), we have determined this area to be essential for the conservation and recovery of these lowland mesic species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Molokai—Lowland Wet—Unit 1 (and)

Palmeria dolei—Unit 38—Lowland Wet (and)

Pseudonestor xanthophrys—Unit 38—Lowland Wet

This area consists of 2,195 ac (888 ha) of State land, and 1,433 ac (580 ha) of privately owned land (partly within The Nature Conservancy's Pelekunu Preserve), from Pelekunu Valley to Wailau Valley, in north-central Molokai. These units are occupied by the plants *Canavalia molokaiensis* and *Cyrtandra filipes,* and include the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the lowland wet ecosystem (see Table 4). These units also contain unoccupied habitat that is essential to the conservation of these species by providing the PCEs necessary for the expansion of the existing wild populations. Although Molokai—Lowland Wet—Unit 1 is not known to be occupied by *Asplenium dielerectum, Bidens wiebkei, Clermontia oblongifolia* ssp. *brevipes, Cyanea dunbariae, C. grimesiana* ssp. *grimesiana, C. solanacea, Lysimachia maxima, Melicope reflexa, Peucedanum sandwicense, Phyllostegia hispida, P. mannii, Plantago princeps, Stenogyne bifida,* or *Zanthoxylum hawaiiense;* or by the forest birds, the akohekohe (*Palmeria dolei*) and kiwikiu (*Pseudonestor xanthophrys*), we have determined this area to be essential for the conservation and recovery of these lowland wet species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Molokai—Lowland Wet—Unit 2 (and)

Palmeria dolei—Unit 39—Lowland Wet (and)

Pseudonestor xanthophrys—Unit 39—Lowland Wet

This area consists of 1,356 ac (549 ha) of State land and 597 ac (241 ha) of privately owned land, from Kahanui to Pelekunu Valley, in north-central Molokai. These units are occupied by the plant *Lysimachia maxima,* and include the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the lowland wet ecosystem (see Table 4). These units also contain unoccupied habitat that is essential to the conservation of this species by providing the PCEs necessary for the expansion of the existing wild populations. Although Molokai—Lowland Wet—Unit 2 is not known to be occupied by *Asplenium dielerectum, Bidens wiebkei, Canavalia molokaiensis, Clermontia oblongifolia* ssp. *brevipes, Cyanea dunbariae, C. grimesiana* ssp. *grimesiana, C. solanacea, Cyrtandra filipes, Melicope reflexa, Peucedanum sandwicense, Phyllostegia hispida, P. mannii, Plantago princeps, Stenogyne bifida,* or *Zanthoxylum hawaiiense;* or by the forest birds, the akohekohe (*Palmeria dolei*) and kiwikiu (*Pseudonestor xanthophrys*), we have determined this area to be essential for the conservation and recovery of these lowland wet species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Molokai—Lowland Wet—Unit 3 consists of 1,128 ac (457 ha) of State land, and 6,945 ac (2,811 ha) of privately owned land, from Waiahookalo and Kahiwa gulches south to Mapulehu, on eastern Molokai. This unit is occupied by the plants *Bidens wiebkei, Cyrtandra filipes,* and *Melicope reflexa,* and includes the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the lowland wet ecosystem (see Table 4). This unit also contains unoccupied habitat that is essential to the conservation of these species by providing the PCEs necessary for the expansion of the existing wild

populations. Although Molokai—Lowland Wet—Unit 3 is not known to be occupied by *Asplenium dielerectum, Canavalia molokaiensis, Clermontia oblongifolia* ssp. *brevipes, Cyanea dunbariae, C. grimesiana* ssp. *grimesiana, C. solanacea, Lysimachia maxima, Peucedanum sandwicense, Phyllostegia hispida, P. mannii, Plantago princeps, Stenogyne bifida,* or *Zanthoxylum hawaiiense,* we have determined this area to be essential for the conservation and recovery of these lowland wet species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Molokai—Montane Wet—Unit 1 (and)

Palmeria dolei—Unit 40—Montane Wet (and)

Pseudonestor xanthophrys—Unit 40—Montane Wet

This area consists of 1,518 ac (615 ha) of State land, and 3,300 ac (1,336 ha) of privately owned land, from the headwaters of Waialelia Stream and above Pelekunu Valley, eastward along the summit area to Mapulehu, in north-central Molokai. These units are occupied by the plants *Adenophorus periens, Bidens wiebkei, Clermontia oblongifolia* ssp. *brevipes, Cyanea mannii, C. profuga, C. solanacea, Lysimachia maxima, Phyllostegia hispida, P. mannii, Platanthera holochila, Pteris lidgatei, Schiedea laui,* and *Stenogyne bifida,* and include the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the montane wet ecosystem (see Table 4). These units also contain unoccupied habitat that is essential to the conservation of this species by providing the PCEs necessary for the expansion of the existing wild populations. Although Molokai—Montane Wet—Unit 1 is not known to be occupied by *Cyanea procera, Hesperomannia arborescens, Melicope reflexa, Phyllostegia pilosa,* or *Zanthoxylum hawaiiense;* or by the forest birds, the akohekohe (*Palmeria dolei*) and kiwikiu (*Pseudonestor xanthophrys*), we have determined this area to be essential for the conservation and recovery of these montane wet species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Molokai—Montane Wet—Unit 2 (and)

Palmeria dolei—Unit 41—Montane Wet (and)

Pseudonestor xanthophrys—Unit 41—Montane Wet

This area consists of 871 ac (353 ha) of State land, and 39 ac (16 ha) of privately owned land, from Honukaupu to Olokui (between Pelekunu and Wailau valleys), in north-central Molokai. These units include the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the montane wet ecosystem (see Table 4). Although Molokai—Montane Wet—Unit 2 is not known to be occupied by *Adenophorus periens, Bidens wiebkei, Clermontia oblongifolia* ssp. *brevipes, Cyanea mannii, C. procera, C. profuga, C. solanacea, Hesperomannia arborescens, Lysimachia maxima, Melicope reflexa, Phyllostegia hispida, P. mannii, P. pilosa, Platanthera holochila, Pteris lidgatei, Schiedea laui, Stenogyne bifida,* or *Zanthoxylum hawaiiense;* or by the forest birds, the akohekohe (*Palmeria dolei*) and kiwikiu (*Pseudonestor xanthophrys*), we have determined this area to be essential for the conservation and recovery of these montane wet species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Molokai—Montane Wet—Unit 3 consists of 77 ac (31 ha) of State land, and 726 ac (294 ha) of privately owned land, above the east rim of Wailau Valley on eastern Molokai. This unit is occupied by the plant *Melicope reflexa,* and includes the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the montane wet ecosystem (see Table 4). This unit also contains unoccupied habitat that is essential to the conservation of this species by providing the PCEs necessary for the expansion of the existing wild populations. Although Molokai—Montane Wet—Unit 3 is not known to be occupied by *Adenophorus periens, Bidens wiebkei, Clermontia oblongifolia* ssp. *brevipes, Cyanea mannii, C. procera, C. profuga, C. solanacea, Hesperomannia arborescens, Lysimachia maxima, Phyllostegia hispida, P. mannii, P. pilosa, Platanthera holochila, Pteris lidgatei, Schiedea laui, Stenogyne bifida,* or *Zanthoxylum hawaiiense,* we have determined this area to be essential for the conservation and recovery of these montane wet species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Molokai—Montane Mesic—Unit 1 (and)

Palmeria dolei—Unit 42—Montane Mesic (and)

Pseudonestor xanthophrys—Unit 42—Montane Mesic

This area consists of 257 ac (104 ha) of State land, and 1,373 ac (555 ha) of privately owned land (partly within The Nature Conservancy's Kamakou Preserve), from Kamiloloa to Makolelau in central Molokai. These units are occupied by the plants *Alectryon macrococcus, Bidens wiebkei, Cyanea mannii, C. procera, Cyperus fauriei, Santalum haleakalae* var. *lanaiense,* and *Spermolepis hawaiiensis,* and include the mixed herbland and shrubland, the moisture regime, and canopy, subcanopy, and understory native plant species identified as physical or biological features in the montane mesic ecosystem (see Table 4). Although Molokai—Montane Mesic—Unit 1 is not known to be occupied by *Asplenium dielerectum, Cyanea dunbariae, C. solanacea, Kadua laxiflora, Melicope mucronulata, Neraudia sericea, Plantago princeps,* or *Stenogyne bifida;* or by the forest birds, the akohekohe (*Palmeria dolei*) and kiwikiu (*Pseudonestor xanthophrys*), we have determined this area to be essential for the conservation and recovery of these montane mesic species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Molokai—Wet Cliff—Unit 1 (and)

Palmeria dolei—Unit 43—Wet Cliff (and)

Pseudonestor xanthophrys—Unit 43—Wet Cliff

This area consists of 1,399 ac (566 ha) of State land, and 489 ac (198 ha) of privately owned land, and encircles the plateau between Pelekunu and Wailau valleys, in north-central Molokai. These units are occupied by the plants *Brighamia rockii, Canavalia molokaiensis, Clermontia oblongifolia* ssp. *brevipes, Hesperomannia arborescens,* and *Hibiscus arnottianus* ssp. *immaculatus,* and include the mixed herbland and shrubland, the moisture regime, and the subcanopy and understory native plant species identified as physical or biological features in the wet cliff ecosystem (see Table 4). Although Molokai—Wet Cliff—Unit 1 is not known to be occupied by *Cyanea grimesiana* ssp. *grimesiana, C. munroi, Phyllostegia hispida, Pteris lidgatei,* or *Stenogyne bifida;* or by the forest birds, the akohekohe (*Palmeria dolei*) and kiwikiu (*Pseudonestor xanthophrys*), we have determined this area to be essential for the conservation and recovery of these wet cliff species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Molokai—Wet Cliff—Unit 2 (and)

Palmeria dolei—Unit 44—Wet Cliff (and)

Pseudonestor xanthophrys—Unit 44—Wet Cliff

This area consists of 462 ac (187 ha) of State land, and 818 ac (331 ha) of privately owned land (partly within The Nature Conservancy's Pelekunu Preserve), along the rim of Pelekunu Valley from Kipapa Ridge to Mapulehu, in central Molokai. These units are occupied by the plant *Phyllostegia hispida,* and include the mixed herbland and shrubland, the moisture regime, and the subcanopy and understory native plant species identified as physical or biological features in the wet cliff ecosystem (see Table 4). These units also contain unoccupied habitat that is essential to the conservation of this species by providing the PCEs necessary for the expansion of the existing wild populations. Although Molokai—Wet Cliff—Unit 2 is not known to be occupied by *Brighamia rockii, Canavalia molokaiensis, Clermontia oblongifolia* ssp. *brevipes, Cyanea grimesiana* ssp. *grimesiana, C. munroi, Hesperomannia arborescens, Hibiscus arnottianus* ssp. *immaculatus, Pteris lidgatei,* or *Stenogyne bifida;* or by the forest birds, the akohekohe (*Palmeria dolei*) and kiwikiu (*Pseudonestor xanthophrys*), we have determined this area to be essential for the conservation and recovery of these wet cliff species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Molokai—Wet Cliff—Unit 3 consists of 1,137 ac (460 ha) of State land, and 225 ac (91 ha) of privately owned land, along the rim of Wailau Valley from Mapulehu to Kahiwa Gulch, in eastern Molokai. This unit includes the mixed herbland and shrubland, the moisture regime, and the subcanopy and understory native plant species identified as physical or biological features in the wet cliff ecosystem (see Table 4). Although Molokai—Wet Cliff—Unit 3 is not known to be occupied by *Brighamia rockii, Canavalia molokaiensis, Clermontia oblongifolia* ssp. *brevipes, Cyanea grimesiana* ssp. *grimesiana, C. munroi, Hesperomannia arborescens, Hibiscus arnottianus* ssp. *immaculatus, Phyllostegia hispida, Pteris lidgatei,* or *Stenogyne bifida,* we have determined this area to be essential for the conservation and recovery of these wet cliff species because it provides the PCEs necessary for the reestablishment of wild populations within their historical range. Due to their small numbers of individuals or low population sizes, suitable habitat and space for expansion or reintroduction are essential to achieving population levels necessary for recovery.

Effects of Critical Habitat Designation

Section 7 Consultation

Section 7(a)(2) of the Act, as amended, 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. Decisions by the Fifth and Ninth Circuit Court of Appeals have invalidated our definition of ''destruction or adverse modification'' (50 CFR 402.02) (See *Gifford Pinchot Task Force* v. *U.S. Fish and Wildlife Service,* 378 F. 3d 1059 (9th Cir. 2004) and *Sierra Club* v. *U.S. Fish and Wildlife Service,* 245 F.3d 434, 442F (5th Cir. 2001)), and we do not rely on this regulatory definition when analyzing whether an action is likely to destroy or adversely modify critical habitat. Under the statutory provisions of the Act, we determine destruction or adverse modification on the basis of whether, with implementation of the proposed Federal action, the affected critical habitat would remain functional (or retain those physical or biological features that relate to the current ability of the area to support the species) to serve its intended conservation role for the species.

If a species is listed or critical habitat is designated, section 7(a)(2) of the Act requires Federal agencies to ensure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of the species or to destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency (action agency) must enter into consultation with us. As a result of this consultation, we document compliance with the requirements of section 7(a)(2) through our issuance of:

(1) A concurrence letter for Federal actions that may affect, but are not likely to adversely affect, listed species or critical habitat; or

(2) A biological opinion for Federal actions that may affect, and are likely to adversely affect, listed species or critical habitat.

If we issue a biological opinion concluding that a project is likely to jeopardize the continued existence of a listed species or destroy or adversely modify critical habitat, we also provide reasonable and prudent alternatives to the project, if any are identifiable. We define ''reasonable and prudent alternatives'' 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;
- Can be implemented consistent with the scope of the Federal agency's legal authority and jurisdiction;
- Are economically and technologically feasible; and
- Would, in the Director's opinion, avoid jeopardizing the continued existence of the listed species or destroying or adversely modifying critical habitat.

Reasonable and prudent alternatives can vary from slight project modifications to extensive redesign or relocation of the project. Costs associated with implementing a

reasonable and prudent alternative are similarly variable.

Regulations at 50 CFR 402.16 require Federal agencies to reinitiate formal consultation on previously reviewed actions in instances where we have listed a new species or subsequently designated critical habitat that may be affected and the Federal agency has retained discretionary involvement or control over the action (or the agency's discretionary involvement or control is authorized by law). Consequently, Federal agencies may sometimes need to request reinitiation of consultation with us on actions for which formal consultation has been completed, if they have retained discretionary involvement or control and the action may affect subsequently listed species or designated critical habitat.

Federal activities that may adversely affect the species included in this proposed rule or their designated critical habitat require section 7 consultation under the Act. Examples of actions that are subject to the section 7 consultation process are actions on State, tribal, local, or private lands that require a Federal permit (such as a permit from the U.S. Army Corps of Engineers under section 404 of the Clean Water Act (33 U.S.C. 1251 *et seq.*), or a permit from us under section 10 of the Act), or activities involving some other Federal action (such as funding from the Federal Highway Administration, Federal Aviation Administration, or the Federal Emergency Management Agency). Federal actions not affecting listed species or critical habitat, and actions on State, tribal, local, or private lands that are not federally funded, authorized, or permitted, do not require section 7 consultations.

Application of the Jeopardy and Adverse Modification Standards

Application of the Jeopardy Standard

The jeopardy analysis usually expresses the survival and recovery needs of a listed species in a qualitative fashion without making distinctions between what is necessary for survival and what is necessary for recovery. Generally, the jeopardy analysis focuses on the status of a species, the factors responsible for that condition, and what is necessary for the species to survive and recover. An emphasis is also placed on characterizing the condition of the species in the area affected by the proposed Federal action. That context is then used to determine the significance of adverse and beneficial effects of the proposed Federal action and any cumulative effects for purposes of making the jeopardy determination. The jeopardy analysis also considers any conservation measures that may be proposed by a Federal action agency to minimize or compensate for adverse effects to the species or to promote its recovery.

Application of the Adverse Modification Standard

The analytical framework described in the Director's December 9, 2004, memorandum is used to complete section 7(a)(2) analysis for Federal actions affecting critical habitat. The key factor related to the adverse modification determination is whether, with implementation of the proposed Federal action, the affected critical habitat would continue to serve its intended conservation role for the species, or would retain its current ability for the essential features to be functionally established. Activities that may destroy or adversely modify critical habitat are those that alter the essential features, or the essential habitat qualities of unoccupied habitat, to an extent that appreciably reduces the conservation value of critical habitat for the 135 species identified in this proposed rule.

Section 4(b)(8) of the Act requires us to briefly evaluate and describe, in any proposed or final regulation that designates critical habitat, activities involving a Federal action that may destroy or adversely modify such habitat, or that may be affected by such designation. Activities that, when carried out, funded, or authorized by a Federal agency, may destroy or adversely modify critical habitat for the 135 species, and therefore may be affected by this proposed designation, include, but are not limited to:

(1) Activities that might appreciably degrade or destroy the physical or biological features for the species including, but not limited to, the following: Overgrazing; maintaining or increasing feral ungulate levels; clearing or cutting native live trees and shrubs (e.g., woodcutting, bulldozing, construction, road building, mining, herbicide application); and taking actions that pose a risk of fire.

(2) Activities that may alter watershed characteristics in ways that would appreciably reduce groundwater recharge or alter natural, wetland, aquatic, or vegetative communities. Such activities include new water diversion or impoundment, excess groundwater pumping, and manipulation of vegetation through activities such as the ones mentioned in (1), above.

(3) Recreational activities that may appreciably degrade vegetation.

(4) Mining sand or other minerals.

(5) Introducing or encouraging the spread of nonnative plant species.

(6) Importing nonnative species for research, agriculture, and aquaculture, and releasing biological control agents.

Application of Section 4(a)(3) of the Act

The Sikes Act Improvement Act of 1997 (Sikes Act) (16 U.S.C. 670a) required each military installation that includes land and water suitable for the conservation and management of natural resources to complete an integrated natural resources management plan (INRMP) by November 17, 2001. An INRMP integrates implementation of the military mission of the installation with stewardship of the natural resources found on the base. Each INRMP includes:

- An assessment of the ecological needs on the installation, including the need to provide for the conservation of listed species;
- A statement of goals and priorities;
- A detailed description of management actions to be implemented to provide for these ecological needs; and
- A monitoring and adaptive management plan.

Among other things, each INRMP must, to the extent appropriate and applicable, provide for fish and wildlife management; fish and wildlife habitat enhancement or modification; wetland protection, enhancement, and restoration where necessary to support fish and wildlife; and enforcement of applicable natural resource laws.

The National Defense Authorization Act for Fiscal Year 2004 (Pub. L. 108–136) amended the Act to limit areas eligible for designation as critical habitat. Specifically, section 4(a)(3)(B)(i) of the Act (16 U.S.C. 1533(a)(3)(B)(i)) provides: ''The Secretary shall not designate as critical habitat any lands or other geographical areas owned or controlled by the Department of Defense, or designated for its use, that are subject to an integrated natural resources management plan prepared under section 101 of the Sikes Act (16 U.S.C. 670a), if the Secretary determines in writing that such plan provides a benefit to the species for which critical habitat is proposed for designation.''

We consult with the military on the development and implementation of INRMPs for installations with listed species. We analyze INRMPs developed by military installations located within the areas that were being considered for critical habitat designation during the

development of this proposed rule to determine if these installations may warrant consideration for exemption under section 4(a)(3) of the Act. There are no Department of Defense (DOD) lands within this proposed critical habitat designation. Therefore, no lands have been exempted from this proposed critical habitat designation under section 4(a)(3) of the Act.

Exclusions

Application of Section 4(b)(2) of the Act

Section 4(b)(2) of the Act states that the Secretary must designate or make revisions to critical habitat on the basis of the best available scientific data after taking into consideration the economic impact, national security impact, and any other relevant impacts of specifying any particular area as critical habitat. The Secretary may exclude an area from critical habitat if he determines that the benefits of such exclusion outweigh the benefits of specifying such area as part of the critical habitat, unless he determines, based on the best scientific data available, that the failure to designate such area as critical habitat will result in the extinction of the species. The Secretary may exclude an area from critical habitat based on economic impacts, impacts to national security, or any other relevant impacts.

In considering whether to exclude a particular area from the designation, we must identify the benefits of including the area in the designation, identify the benefits of excluding the area from the designation, and determine whether the benefits of exclusion outweigh the benefits of inclusion. If, based on this analysis, the Secretary makes this determination, he can exercise his discretion to exclude the area only if such exclusion would not result in the extinction of the species.

When considering the benefits of inclusion for an area, we consider the additional regulatory benefits that area would receive from the protection from adverse modification or destruction as a result of actions with a Federal nexus, the educational benefits of mapping habitat essential for recovery of the listed species, and any benefits that may result from a designation due to State or Federal laws that may apply to critical habitat. Benefits could include public awareness of the presence of listed species and the importance of habitat protection, and in cases where a Federal nexus exists, increased habitat protection due to the protection from adverse modification or destruction of critical habitat.

When considering the benefits of exclusion, we consider factors such as whether exclusion of a specific area is likely to result in conservation; the continuation, strengthening, or encouragement of partnerships; or the implementation of a management plan that provides equal to or more conservation than a critical habitat designation would provide. In the case of the 135 Maui Nui species, there may be little additional regulatory effect resulting from the designation in areas occupied by 1 or more of the 135 species; however, the benefits of designating critical habitat include educational benefits resulting from identification of the features essential to the conservation these species and the delineation of areas important for their recovery. Further, there may be additional benefits realized by providing landowners, stakeholders, and project proponents greater certainty about which specific areas are important for the Maui Nui species. Thus, critical habitat designation increases public awareness of the presence the Maui Nui species and the importance of habitat protection and, in cases where a Federal nexus exists, increases habitat protection for these species due to the protection from adverse modification or destruction of critical habitat.

In evaluating the existence of a conservation plan when considering the benefits of exclusion, we consider a variety of factors including, but not limited to, whether the plan is finalized; how it provides for the conservation of the essential physical or biological features; whether there is a reasonable expectation that the conservation management strategies and actions contained in a management plan are likely to be implemented into the future; whether the conservation strategies in the plan are likely to be effective; and whether the plan contains a monitoring program or adaptive management to ensure that the conservation measures are effective and can be adapted in the future in response to new information.

After evaluating the benefits of inclusion and the benefits of exclusion, the two sides are carefully weighed to determine whether the benefits of exclusion outweigh those of inclusion. If they do, we then determine whether exclusion of the particular area would result in the extinction of the species. If exclusion of an area from critical habitat will result in extinction, it will not be excluded from the designation.

The Secretary can consider the existence of conservation agreements, other land management plans and voluntary partnerships with Federal, private, State, and tribal entities when making decisions under section 4(b)(2) of the Act. In weighing the benefits of inclusion versus exclusion, we may consider factors such as: (1) Whether the plan provides specific information on how it protects the species and the physical or biological features, and whether the plan is at a geographic scope commensurate with the species; (2) whether the plan is complete and will be effective at conserving and protecting the physical or biological features; (3) whether a reasonable expectation exists that conservation management strategies and actions will be implemented, that those responsible for implementing the plan are capable of achieving the objectives, that an implementation schedule exists, and that adequate funding exists; (4) whether the plan provides assurances that the conservation strategies and measures will be effective (i.e., identifies biological goals, has provisions for reporting progress, and is of a duration sufficient to implement the plan); (5) whether the plan has a monitoring program or adaptive management to ensure that the conservation measures are effective; (6) the degree to which the record supports a conclusion that a critical habitat designation would impair the benefits of the plan; (7) the extent of public participation; (8) demonstrated track record of implementation success; (9) level of public benefits derived from encouraging collaborative efforts and encouraging private and local conservation efforts; and (10) the effect designation would have on partnerships. We will also consider whether these efforts would be affected by critical habitat and, if so, whether this would outweigh the advantages of critical habitat.

Based on the information provided by entities seeking exclusion, as well as any additional public comments we receive, we will evaluate whether certain lands in proposed critical habitat may be appropriate for exclusion from the final designation. If our analysis results in a determination that the benefits of excluding particular areas from the final designation outweigh the benefits of designating those areas as critical habitat, then the Secretary may exercise his discretion to exclude the particular areas from the final designation.

Under section 4(b)(2) of the Act, we must consider all relevant impacts, including economic impacts. In addition to economic impacts, we consider a number of factors in a section 4(b)(2) analysis. For example, we consider whether there are lands owned by the DOD where a national security impact might exist. We also consider whether Federal or private landowners

or other public agencies have developed management plans or HCPs for the area or whether there are conservation partnerships that would be encouraged or discouraged by designation of, or exclusion from, critical habitat in an area. We also consider any social impacts that might occur because of the designation. To ensure that our final determination is based on the best available information, we are inviting comments on any foreseeable economic, national security, or other potential impacts resulting from this proposed designation of critical habitat from governmental, business, or private interests and, in particular, any potential impacts on small businesses.

Exclusions Based on Economic Impacts

Under section 4(b)(2) of the Act, we consider the economic impacts of specifying any particular area as critical habitat. In order to consider economic impacts, we are preparing an analysis of the probable economic impacts of the proposed critical habitat designation and related factors.

We will announce the availability of the draft economic analysis as soon as it is completed, at which time we will seek public review and comment. At that time, copies of the draft economic analysis will be available for downloading from the Internet at the Federal eRulemaking Portal: *http://www.regulations.gov*, or by contacting the Pacific Islands Fish and Wildlife Office directly (see **FOR FURTHER INFORMATION CONTACT**). During the development of a final designation, we will consider economic impacts, public comments, and other new information, and as an outcome of our analysis of this information, we may exclude areas from the final critical habitat designation under section 4(b)(2) of the Act and our implementing regulations at 50 CFR 424.19.

Exclusions Based on National Security Impacts

Under section 4(b)(2) of the Act, we consider whether there are lands owned or managed by the DOD where a national security impact might exist. There are no DOD lands within this proposed critical habitat designation, and we are unaware of any potential impacts to national security on any lands within the proposed critical habitat designation. Therefore, we do not propose to exert our discretion to exclude any areas from the final designation based on impacts on national security, but will fully consider all comments in this regard in the final critical habitat designation.

Exclusions Based on Other Relevant Factors

Under section 4(b)(2) of the Act, we consider any other relevant impacts, in addition to economic impacts and impacts to national security. We consider a number of factors, including whether the landowners have developed any conservation plans or other management plans for the area, or whether there are conservation partnerships that would be encouraged by designation of, or exclusion from, critical habitat. We also consider any social impacts that might occur because of the designation.

Most federally listed species in the United States will not recover without cooperation of non-Federal landowners. More than 60 percent of the United States is privately owned (Lubowski *et al.* 2006, p. 35), and at least 80 percent of endangered or threatened species occur either partially or solely on private lands (Crouse *et al.* 2002, p. 720). In the State of Hawaii, 84 percent of landownership is non-Federal (U.S. General Services Administration, in Western States Tourism Policy Council, 2009). Stein *et al.* (2008, p. 340) found that only about 12 percent of listed species were found almost exclusively on Federal lands (90 to 100 percent of their known occurrences restricted to Federal lands) and that 50 percent of listed species are not known to occur on Federal lands at all.

Given the distribution of listed species with respect to landownership, conservation of listed species in many parts of the United States is dependent upon working partnerships with a wide variety of entities and the voluntary cooperation of many non-Federal landowners (Wilcove and Chen 1998, p. 1,407; Crouse *et al.* 2002, p. 720; James 2002, p. 271). Building partnerships and promoting voluntary cooperation of landowners is essential to understanding the status of species on non-Federal lands and necessary to implement recovery actions, such as the reintroduction of listed species, habitat restoration, and habitat protection.

Many non-Federal landowners derive satisfaction from contributing to endangered species recovery. Conservation agreements with non-Federal landowners, safe harbor agreements, other conservation agreements, easements, and State and local regulations enhance species conservation by extending species protections beyond those available through section 7 consultations. We encourage non-Federal landowners to enter into conservation agreements based on a view that we can achieve greater species conservation on non-Federal lands through such partnerships than we can through regulatory methods (USFWS and NOAA 1996c (61 FR 63854, December 2, 1996)).

Many private landowners, however, are wary of the possible consequences of attracting endangered species to their property. Mounting evidence suggests that some regulatory actions by the government, while well intentioned and required by law, can (under certain circumstances) have unintended negative consequences for the conservation of species on private lands (Wilcove *et al.* 1996, pp. 5–6; Bean 2002, pp. 2–3; James 2002, pp. 270–271; Koch 2002, pp. 2–3). Many landowners fear a decline in their property value due to real or perceived restrictions on land-use options where endangered or threatened species are found. Consequently, harboring endangered species is viewed by many landowners as a liability. This perception results in anti-conservation incentives because maintaining habitats that harbor endangered species represents a risk to future economic opportunities (Main *et al.* 1999, pp. 1,264–1,265; Brook *et al.* 2003, pp. 1,644–1,648).

According to some researchers, the designation of critical habitat on private lands significantly reduces the likelihood that landowners will support and carry out conservation actions (Main *et al.* 1999, p. 1,263; Bean 2002, p. 2). The magnitude of this negative outcome is greatly amplified in situations where active management measures (such as reintroduction, fire management, and control of invasive species) are necessary for species conservation (Bean 2002, pp. 3–4). We believe the judicious exclusion of specific areas of non-federally owned lands from critical habitat designations can contribute to species recovery and provide a superior level of conservation than critical habitat alone.

The purpose of designating critical habitat is to contribute to the conservation of endangered and threatened species and the ecosystems upon which they depend. The outcome of the designation, triggering regulatory requirements for actions funded, authorized, or carried out by Federal agencies under section 7(a)(2) of the Act, can sometimes be a disincentive to conservation on non-Federal lands. Thus, the benefits of excluding areas that are covered by partnerships or voluntary conservation efforts can, in specific circumstances, be high.

For the reasons discussed under the ''Application of Section 4(b)(2) of the Act'' section of this rule, if the Secretary decides to exercise his discretion under

section 4(b)(2) of the Act, we have identified certain areas that we are considering excluding from the final critical habitat designation for 135 plant and animal species. However, we solicit comments on the inclusion or exclusion of such particular areas (See ''Public Comments'' section). During the development of the final designation, we will consider economic impacts, public comments, and other new information before deciding if inclusion or exclusion of these areas is warranted. As a result, additional particular areas, in addition to those identified below for potential exclusion in this proposed rule, may be excluded from the final critical habitat designation under section 4(b)(2) of the Act.

Conservation Partnerships on Non-Federal Lands

The Nature Conservancy's Kapunakea Preserve and Waikamoi Preserve on Maui, and Kamakou Preserve and Moomomi Preserve on Molokai:

We are considering excluding 10,038 ac (4,061 ha) of habitat within TNC's Kapunakea Preserve on west Maui and Waikamoi Preserve on east Maui, and Kamakou Preserve and Moomomi Preserve on Molokai (Figures 2 and 3).

BILLING CODE 4310–55–P

Figure 2

The Nature Conservancy of Hawaii–Maui

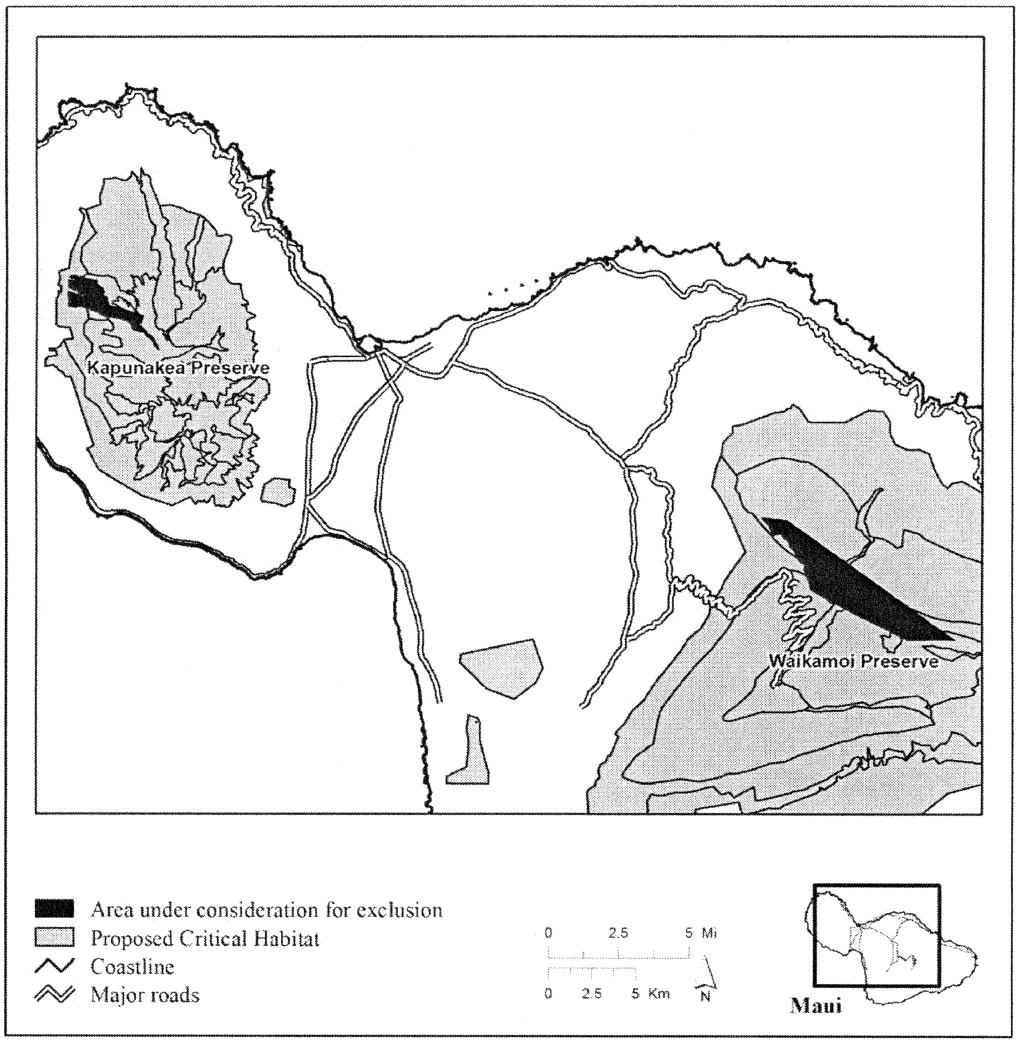
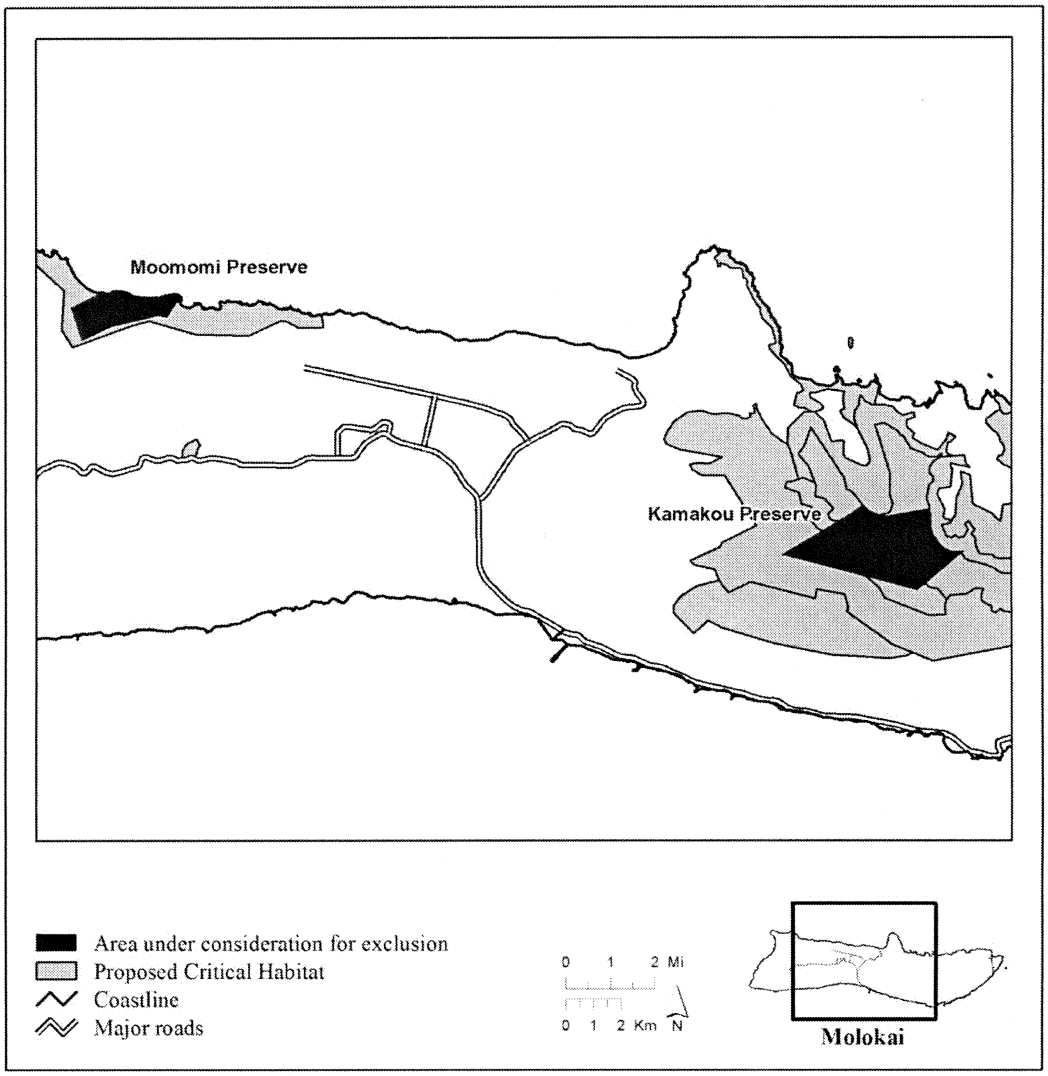


Figure 3

The Nature Conservancy of Hawaii–Molokai



BILLING CODE 4310–55–C

Maui

Kapunakea Preserve encompasses 1,339 ac (542 ha) on west Maui. This preserve was established through a perpetual conservation easement with Pioneer Mill Company, Ltd. (succeeded by Kaanapali Land Management Corp.), in 1992, to protect the natural, ecological, and wildlife features of one of the highest quality native areas in Hawaii (TNCH 2008, p. 5). Ten plant species included in this rule (*Alectryon macrococcus, Bidens micrantha* ssp. *kalealaha, Bonamia menziesii, Colubrina oppositifolia, Ctenitis squamigera, Cyanea lobata, Cyrtandra filipes, C. munroi, Platanthera holochila,* and *Santalum haleakalae* var. *lanaiense*) are reported from the preserve. Kapunakea Preserve falls within four proposed critical habitat units for plants (Maui—Lowland Mesic—2, Maui—Lowland Wet—6, Maui—Montane Wet—6, and Maui—Wet Cliff—7), and six proposed units for the akohekohe and kiwikiu (*Palmeria dolei*—Unit 7—Lowland Wet, *Pseudonestor xanthophrys*—Unit 7—Lowland Wet, *Palmeria dolei*—Unit 15—Montane Wet, *Pseudonestor xanthophrys*—Unit 15—Montane Wet, *Palmeria dolei*—Unit 36—Wet Cliff, *Pseudonestor xanthophrys*—Unit 36—Wet Cliff). These units are occupied by the plants *Alectryon macrococcus, Bidens campylotheca* ssp. *pentamera, B. conjuncta, B. micrantha* ssp. *kalealaha, Bonamia menziesii, Calamagrostis hillebrandii, Colubrina oppositifolia, Ctenitis squamigera, Cyanea asplenifolia, C. kunthiana, C. lobata, Cyrtandra filipes, C. munroi, Geranium hillebrandii, Myrsine vaccinioides, Platanthera holochila, Remya mauiensis, Sanicula purpurea, Santalum haleakalae* var. *lanaiense,* and *Zanthoxylum hawaiiense.* This area contains unoccupied habitat that is essential to the conservation of 21 plant species, *Acaena exigua, Asplenium*

dielerectum, Clermontia oblongifolia ssp. *mauiensis, Cyanea glabra, C. magnicalyx, Cyrtandra oxybapha, Diplazium molokaiense, Dubautia plantaginea* ssp. *humilis, Gouania vitifolia, Hesperomannia arborescens, H. arbuscula, Huperzia mannii, Isodendrion pyrifolium, Kadua laxiflora, Lysimachia lydgatei, Peucedanum sandwicense, Phyllostegia bracteata, Plantago princeps, Pteris lidgatei, Tetramolopium capillare,* and *Wikstroemia villosa,* and the akohekohe and kiwikiu.

Waikamoi Preserve encompasses 5,140 ac (2,080 ha) along the northern border of Haleakala National Park on east Maui. The preserve was established in 1983, through a perpetual conservation easement with Haleakala Ranch Company, to protect one of the largest intact native rain forests in Hawaii (TNCH 2006a, p. 3). Eight plant species included in this rule (*Asplenium peruvianum* var. *insulare, Bidens campylotheca* ssp. *pentamera, Cyanea horrida, C. kunthiana, Diplazium molokaiense, Geranium arboreum, G. multiflorum,* and *Phyllostegia pilosa*), and the akohekohe and kiwikiu, are reported from the preserve. Waikamoi Preserve falls within 8 proposed critical habitat units for plants (Maui—Montane Wet—1, Maui—Montane Wet—2, Maui—Montane Mesic—1, Maui—Subalpine—1, Maui—Subalpine—2, Maui—Dry Cliff—1, Maui—Dry Cliff—3, and Maui—Wet Cliff—1), and 16 proposed units for the akohekohe and kiwikiu (*Palmeria dolei*—Unit 10—Montane Wet, *Pseudonestor xanthophrys*—Unit 10—Montane Wet, *Palmeria dolei*—Unit 11—Montane Wet, *Pseudonestor xanthophrys*—Unit 11—Montane Wet, *Palmeria dolei*—Unit 18—Montane Mesic, *Pseudonestor xanthophrys*—Unit 18—Montane Mesic, *Palmeria dolei*—Unit 24—Subalpine, *Pseudonestor xanthophrys*—Unit 24—Subalpine, *Palmeria dolei*—Unit 25—Subalpine, *Pseudonestor xanthophrys*—Unit 25—Subalpine, *Palmeria dolei*—Unit 26—Dry Cliff, *Pseudonestor xanthophrys*—Unit 26—Dry Cliff, *Palmeria dolei*—Unit 27—Dry Cliff, *Pseudonestor xanthophrys*—Unit 27—Dry Cliff, *Palmeria dolei*—Unit 30—Wet Cliff, and *Pseudonestor xanthophrys*—Unit 30—Wet Cliff). These units are occupied by the plants *Argyroxiphium sandwicense* ssp. *macrocephalum, Asplenium dielerectum, A. peruvianum* var. *insulare, Bidens campylotheca* ssp. *pentamera, B. campylotheca* ssp. *waihoiensis, B. micrantha* ssp. *kalealaha, Clermontia lindseyana, C. oblongifolia* ssp. *mauiensis, C. samuelii, Cyanea copelandii* ssp. *haleakalensis, C. duvalliorum, C. hamatiflora* ssp. *hamatiflora, C. horrida, C. kunthiana, C. maritae, C. mceldowneyi, C. obtusa, Cyrtandra ferripilosa, C. oxybapha, Diplazium molokaiense, Geranium arboreum, G. hanaense, G. multiflorum, Huperzia mannii, Melicope adscendens, M. balloui, Neraudia sericea, Phyllostegia pilosa, Plantago princeps, Santalum haleakalae* var. *lanaiense, Schiedea haleakalensis,* and *Wikstroemia villosa,* and the akohekohe and kiwikiu. This area contains unoccupied habitat that is essential to the conservation of 12 other plant species (*Adenophorus periens, Alectryon macrococcus, C. glabra, Melicope ovalis, Peperomia subpetiolata, Phyllostegia bracteata, P. haliakalae, P. mannii, Platanthera holochila, Schiedea jacobii, Solanum incompletum,* and *Zanthoxylum hawaiiense*).

Molokai

Kamakou Preserve is located in the east Molokai mountains and encompasses 2,632 ac (1,065 ha). This preserve was established in 1982, through a perpetual conservation easement with Molokai Ranch, to protect endemic forest bird habitat and is the primary ground and surface water source area on the island (TNCH 2006b, p. 2). Nineteen plant species included in this rule (*Adenophorus periens, Asplenium dielerectum, Bidens wiebkei, Canavalia molokaiensis, Clermontia oblongifolia* ssp. *brevipes, Cyanea mannii, C. procera, C. solanacea, Cyperus faurei, Lysimachia maxima, Melicope mucronulata, Phyllostegia hispida, P. mannii, Platanthera holochila, Santalum haleakalae* var. *lanaiense, Schiedea laui, Stenogyne bifida, Vigna o-wahuensis,* and *Zanthoxylum hawaiiense*) are reported from the preserve. Kamakou Preserve falls within four proposed critical habitat units for plants (Molokai—Lowland Mesic—1, Molokai—Montane Wet—1, Molokai—Montane Mesic—1, and Molokai—Wet Cliff—2) and eight proposed units for the akohekohe and kiwikiu (*Palmeria dolei*—Unit 37—Lowland Mesic, *Pseudonestor xanthophrys*—Unit 37—Lowland Mesic, *Palmeria dolei*—Unit 40—Montane Wet, *Pseudonestor xanthophrys*—Unit 40—Montane Wet, *Palmeria dolei*—Unit 42—Montane Mesic, *Pseudonestor xanthophrys*—Unit 42—Montane Mesic, *Palmeria dolei*—Unit 44—Wet Cliff, and *Pseudonestor xanthophrys*—Unit 44—Wet Cliff). These units are occupied by the plants *Adenophorus periens, Alectryon macrococcus, Asplenium dielerectum, Bidens wiebkei, Canavalia molokaiensis, Clermontia oblongifolia* ssp. *brevipes, Ctenitis squamigera, Cyanea dunbariae, C. mannii, C. procera, C. profuga, C. solanacea, Cyperus faurei, Cyrtandra filipes, Festuca molokaiensis, Gouania hillebrandii, Labordia triflora, Lysimachia maxima, Melicope mucronulata, Neraudia sericea, Phyllostegia hispida, P. mannii, Platanthera holochila, Pteris lidgatei, Santalum haleakalae* var. *lanaiense, Schiedea laui, S. lydgatei, S. sarmentosa, Silene alexandri, S. lanceolata, Spermolepis hawaiiensis, Stenogyne bifida, Vigna o-wahuensis,* and *Zanthoxylum hawaiiense.* This area contains unoccupied habitat that is essential for the conservation of 16 other plant species (*Bonamia menziesii, Brighamia rockii, Cyanea grimesiana* ssp. *grimesiana, C. munroi, Diplazium molokaiense, Eugenia koolauensis, Flueggea neowawraea, Hesperomannia arborescens, Hibiscus arnottianus* ssp. *immaculatus, Isodendrion pyrifolium, Kadua laxiflora, Melicope reflexa, Phyllostegia haliakalae, P. pilosa, Plantago princeps,* and *Sesbania tomentosa*), and to the akohekohe and kiwikiu.

Moomomi Preserve encompasses 924 ac (374 ha) along the northwest shore of Molokai that are owned by TNC. This preserve was established in 1988, to protect the most intact coastal ecosystem in Hawaii, with nesting seabirds, nesting green sea turtles, and a variety of native coastal plants (TNCH 2005, pp. 2–3). One plant species included in this rule, *Tetramolopium rockii,* is reported from the Preserve. Moomomi Preserve falls within one proposed critical habitat unit, Molokai—Coastal—2. This unit is occupied by *Marsilea villosa, Schenkia sebaeoides, Sesbania tomentosa,* and *Tetramolopium rockii.* This area contains unoccupied habitat that is essential to the conservation of eight other plant species (*Bidens wiebkei, Brighamia rockii, Canavalia molokaiensis, Hibiscus arnottianus* ssp. *immaculatus, H. brackenridgei, Ischaemum byrone, Peucedanum sandwicense,* and *Pittosporum halophilum*).

All four preserves were established by grants of perpetual conservation easements from the private landowners to TNC, or are owned by TNC, and are included in the State's Natural Area Partnership (NAP) programs which provides matching funds for the management of private lands that have been permanently dedicated to conservation (TNCH 2005, pp. 2–3; TNCH 2006a, p. 3; TNCH 2006b, p. 2; TNCH 2008, p. 50). These partnerships

with the State began in 1983 (with Haleakala Ranch) for Waikamoi, and were followed in 1992 (with Kaanapali Land Management Corporation) for Kapunakea, in 1995 (with Molokai Ranch) for Kamakou, and in 1995 for Moomomi (TNC-owned). Under the NAP program, the State of Hawaii provides matching funds on a two-for-one basis for management of private lands dedicated to conservation. In order to qualify for this program, the land must be dedicated in perpetuity through transfer of fee title or a conservation easement to the State or a cooperating entity. The land must be managed by the cooperating entity or a qualified landowner according to a detailed management plan approved by the Board of Land and Natural Resources. Once approved, the 6-year partnership agreement between the State and the managing entity is automatically renewed each year so that there are always 6 years remaining in the term, although the management plan is updated and funding amounts are reauthorized by the board at least every 6 years. By April 1 of any year, the managing partner may notify the State that it does not intend to renew the agreement; however, in such case, the partnership agreement remains in effect for the balance of the existing 6-year term, and the conservation easement remains in full effect in perpetuity. The conservation easement may be revoked by the landowner only if State funding is terminated without the concurrence of the landowner and cooperating entity. Prior to terminating funding, the State must conduct one or more public hearings. The NAP program is funded through real estate conveyance taxes placed in a Natural Area Reserve Fund. Participants in the NAP program must provide annual reports to the DLNR and the DLNR makes annual inspections of the work in the reserve areas (see State of Hawaii 1999, H.R.S. 195–D; State of Hawaii 1996, H.A.R. 13–210).

Management programs within the preserves are documented in long-range management plans and yearly operational plans. These plans detail management measures that protect, restore, and enhance rare plants and animals and their habitats within the preserves and in adjacent areas. These management measures address factors then threaten the 135 species in this rule for which critical habitat is proposed, including control of nonnative species of ungulates, rodents, and weeds. In addition, habitat restoration and monitoring are also included in these plans.

The primary management goals for each of the four TNC preserves are to: (1) Prevent degradation of native forest and shrubland by reducing feral ungulate damage; (2) improve or maintain the integrity of native ecosystems in selected areas of the preserve by reducing the effects of nonnative plants; (3) conduct small mammal control and reduce their negative impacts where possible; (4) monitor and track the biological and physical resources in the preserve and evaluate changes in these resources over time, and encourage biological and environmental research; (5) prevent extinction of rare species in the preserve; (6) build public understanding and support for the preservation of natural areas, and enlist volunteer assistance for preserve management; and (7) protect the resources from fires in and around the preserve (applicable to preserves in high fire-risk areas) (TNCH 2005, 148 pp. + appendices; TNCH 2006a, 23 pp. + appendices; TNCH 2006b, 21 pp. + appendices; TNCH 2008, 30 pp.).

The goal of TNCs ungulate program (see (1), above) is to bring feral ungulate populations to zero within the preserves as rapidly as possible, and to prevent domestic livestock from entering a preserve. Specific management actions to address feral ungulate impacts include the construction of fences, including strategic fences (fences placed in proximity to natural barriers such as cliffs); annual monitoring of ungulate presence in transects; monthly boundary fence inspections; and trained staff and volunteer hunting. As axis deer also pose a threat to the preserves, TNC is a member of the Maui Axis Deer Group (MADG), and TNC meets regularly with MADG to seek management solutions. Ungulate management actions also include working with community hunters in conjunction with watershed partnerships for each island. By monitoring ungulate activity within each of the preserves, the staff is able to assess the success of the hunting program. If increased hunting pressure does not reduce feral ungulate activity in a preserve, preserve staff work with the hunting group to identify and implement alternative methods (TNCH 2005, pp. 7–8; TNCH 2006a, pp. 7–10; TNCH 2006b, pp. 8–9; TNCH 2008, pp. 9–10).

The nonnative plant control program (see (2), above) for each of the four TNC preserves focuses on controlling habitat-modifying nonnative plants (weeds) in intact native communities and preventing the introduction of additional nonnative plants. Based on the degree of threat to native ecosystems, weed priority lists have been compiled for each of the preserves, and control and monitoring of the highest priority species are ongoing. Weeds are controlled manually, chemically, or through a combination of both. Preventive measures (prevention protocol) are required by all who enter each of the preserves. This protocol includes such things as brushing footgear before entering the preserve to remove seeds of nonnative plants. Weeds are monitored along transects annually. Weed priority maps are maintained semi-annually. Staff participate as members of the Melastome Action Committee and the Maui and Molokai Invasive Species committees (MISC and MoMISC), and cooperate with the State Division of Conservation and Resources Enforcement (DOCARE) in marijuana control, as needed (TNCH 2005, pp. 8–9; TNCH 2006a, pp. 11–13; TNCH 2006b, pp. 10–12; TNCH 2008, pp. 11–13).

The Nature Conservancy controls or prevents entry of nonnative mammals such as rats, cats (*Felis catus*), mongoose (*Herpestes auropunctatus*), and dogs (*Canis familiaris*), on their preserves (see (3), above). These mammals have negative impacts on reproduction and persistence of native plants and animals. Independent studies and research regarding the effects of small nonnative mammals on native ecosystems on all four preserves is encouraged by TNC. Small mammal trapping is conducted in Moomomi Preserve to protect ground nesting native seabirds from predation (TNCH 2005, p. 6). While the most effective control methods for rats on TNC preserves are still under investigation, an intensive rat baiting program is in place at Kamakou Preserve to control rats, which prey upon native snails and plants (TNCH 2006a, pp. 2, 6; TNCH 2009b, p. 21). The Nature Conservancy's predator control program is directed by adaptive management (TNCH 2010a, pp. 3–5).

Natural resource monitoring and research address the need to track the biological and physical resources of the preserves and evaluate changes in these resources to guide management programs, and contribute to prevention of extinction of rare species (see (4) and (5), above). Vegetation is monitored throughout each preserve to document long-term ecological changes, and rare plant species are monitored to assess population status. The Nature Conservancy provides logistical and other support to PEPP, including implementing threat abatement measures on their preserves (TNCH 2010a, p. 13). Bird surveys are

conducted every 5 years to document the relative abundance of all bird species in the the preserves (TNCH 2010b, p. 16). Portions of the four preserves are adjacent to other areas managed to protect natural resources. Agreements with those land managers are used to coordinate management efforts, and to share staff, equipment, and expertise to maximize management efficiency. The Nature Conservancy takes an active part in planning and coordinating conservation actions with, and is a member of, the East Maui Watershed Partnership (EMWP), the West Maui Mountains Watershed Partnership (WMMWP), and the East Molokai Watershed Partnership (EMOWP) (TNCH 2006a, p. 3; TNCH 2008, p. 21; TNCH 2010a, p. 2).

The Nature Conservancy's goal to increase conservation and advocacy for native ecosystems in Hawaii is implemented through their public outreach program (see (6), above). The Nature Conservancy provides sites and volunteer work for youth groups such as Ho'ikaika and AmeriCorps, and summer internships for youth and young adults (Alu Like, State Summer Youth Employment Program, Molokai Environmental Preservation Organization, and the Natural Resources Academy), providing students with hands-on experience in natural resource conservation. Other community groups, such as the Molokai Advisory Council, Molokai Hunting Working Group, and Kamalo Conservation Advisors, are encouraged to participate in the decision-making process for TNC's natural resources programs. The Nature Conservancy staff present slide shows and talks as requested by community and school groups, and lead guided hikes in their preserves for public schools and targeted community members. The Nature Conservancy produces a quarterly newsletter distributed on Molokai to inform the local community regarding conservation activities and opportunities (TNCH 2006b, pp. 18–19; TNCH 2008, p. 20).

Fire management is an important goal for two Molokai preserves (Kamakou Preserve on Molokai and Kapunakea Preserve on west Maui (TNCH 2006b, p. 15; TNCH 2008, p. 22) (see (7), above). Wildfire management plans are updated annually. Staff is provided with fire suppression training, roads are maintained for access and as fire breaks, and equipment is supplied as needed to allow immediate response to fire threats (TNCH 2005, p. 13).

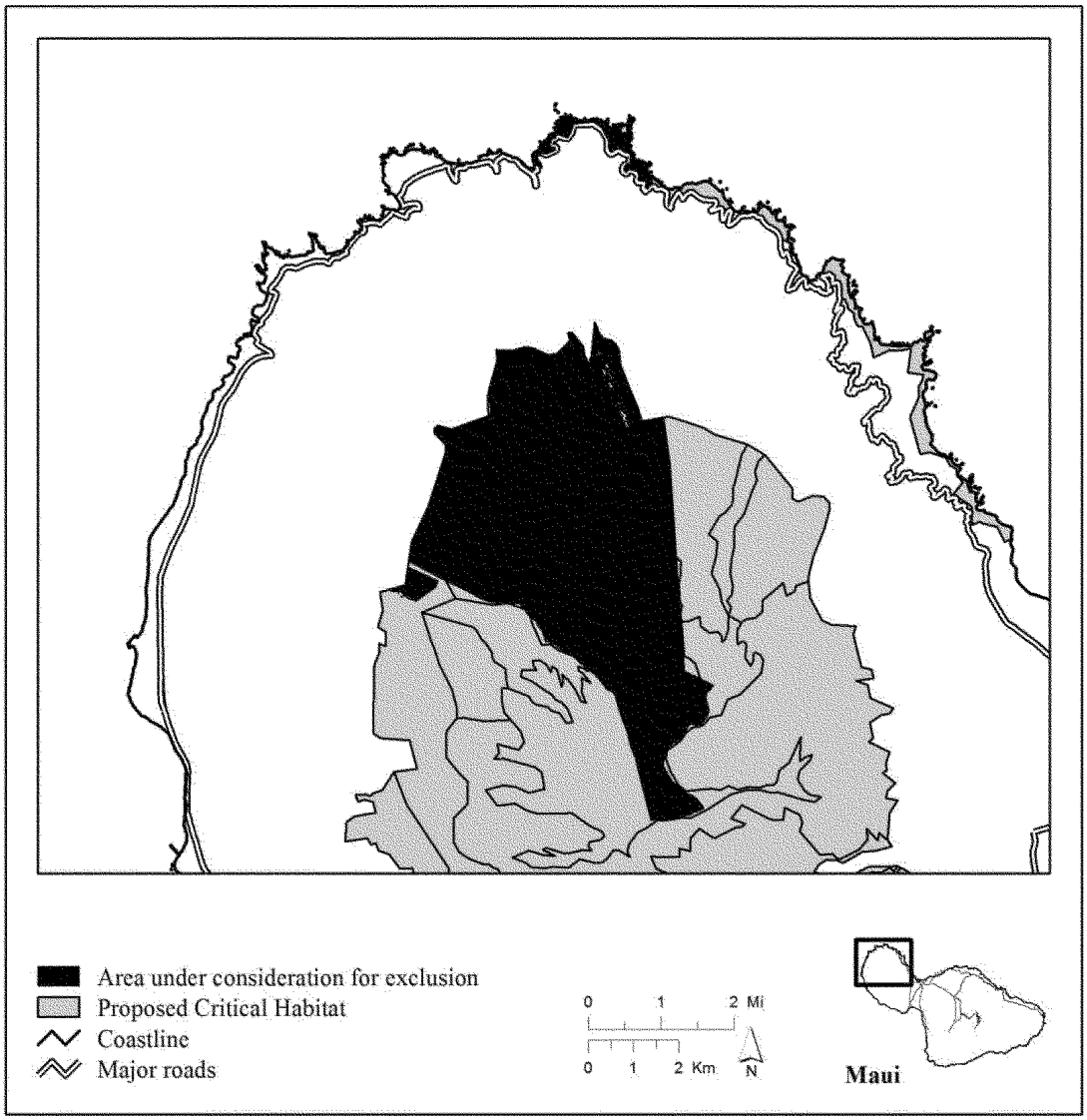
The four TNC preserves, and the continuing protection and management of the native plants, animals, and their habitats provided by TNC and cooperating landowners and partners within the preserves, provide a conservation benefit to the 106 species for which critical habitat is proposed on TNC lands. Designation of critical habitat on these lands could be a disincentive to this land manager, who has demonstrated a willingness to manage these lands in a manner compatible with the conservation of listed and non-listed species; therefore, we are considering excluding these four TNC preserves from the designation of critical habitat. We are requesting comments and information regarding these areas and will determine whether these lands may warrant exclusion from critical habitat for the 106 species for which critical habitat is proposed on TNC lands, in our final rule.

Maui Land and Pineapple Company

The Service is considering excluding 8,931 ac (3,614 ha) of habitat associated with Maui Land and Pineapple Company's (ML & P) lands, including Puu Kukui WP (Figure 4).

Figure 4

Maui Land & Pineapple Company



Fourteen plant species (*Bidens conjuncta, Ctenitis squamigera, Cyanea asplenifolia, C. kunthiana, C. lobata, C. magnicalyx, Cyrtandra filipes, C. munroi, Hesperomania arborescens, H. arbuscula, Myrsine vaccinioides, Sanicula purpurea, Santalum haleakalae* var. *lanaiense,* and *Sesbania tomentosa*) occur in this area. The area under consideration falls within seven proposed critical habitat units for plants (Maui—Coastal—9, Maui—Lowland Mesic—2, Maui—Lowland Wet—2, Maui—Lowland Wet—3, Maui—Montane Wet—6, Maui—Wet Cliff—5, and Maui—Wet Cliff—7), and eight proposed critical habitat units for birds (*Palmeria dolei*—Unit 3—Lowland Wet, *Pseudonestor xanthophrys*—Unit 3—Lowland Wet, *Palmeria dolei*—Unit 4—Lowland Wet, *Pseudonestor xanthophrys*—Unit 4—Lowland Wet, *Palmeria dolei*—Unit 15—Montane Wet, *Pseudonestor xanthophrys*—Unit 15—Montane Wet, *Palmeria dolei*—Unit 34—Wet Cliff, and *Pseudonestor xanthophrys*—Unit 34—Wet Cliff). These units are occupied by the plants *Alectryon macrococcus, Bidens campylotheca* ssp. *pentamera, B. conjuncta, Bonamia menziesii, Calamagrostis hillebrandii, Colubrina oppositifolia, Ctenitis squamigera, Cyanea asplenifolia, C. kunthiana, C. lobata, C. magnicalyx, Cyrtandra filipes, C. munroi, Geranium hillebrandii, Hesperomannia arborescens, Myrsine vaccinioides, Platanthera holochila, Pteris lidgatei, Remya mauiensis, Sanicula purpurea, Santalum haleakalae* var. *lanaiense, Sesbania tomentosa, Schenkia sebaeoides,* and *Zanthoxylum hawaiiense.* This area contains habitat that is unoccupied but essential to the conservation of 20 other plant species (*Acaena exigua, Asplenium dielerectum, Brighamia rockii, Bidens micrantha* ssp. *kalealaha, Clermontia oblongifolia* ssp. *mauiensis, Cyanea glabra, Cyrtandra oxybapha, Diplazium molokaiense, Dubautia plantaginea* ssp. *humilis, Gouania vitifolia, Hesperomannia arbuscula, Huperzia mannii, Isodendrion*

pyrifolium, Kadua laxiflora, Lysimachia lydgatei, Peucedanum sandwicense, Phyllostegia bracteata, Plantago princeps, Tetramolopium capillare, and *Wikstroemia villosa*), and to the akohekohe and kiwikiu.

We are proposing critical habitat in a portion of Puu Kukui WP (599 ac (242 ha)) where the remaining nine wild individuals of the tree snail *Newcombia cumingi* occur (*Newcombia cumingi*—Unit 1—Lowland Wet). While this area overlaps proposed critical habitat plant unit Maui—Lowland Wet—2 that is being considered for exclusion from critical habitat for plant species, we are not considering excluding these 599 ac (242 ha) from critical habitat for *N. cumingi* because there is no beneficial management in place or implemented for the conservation of these snails. However, we encourage the private landowner to work collaboratively with the Service to develop appropriate management plans, actions, or protections for this species. We are available and prepared to work with the private landowner for the protection and conservation of *N. cumingi* on Puu Kukui WP, and will consider all management or protective measures for this species in our final critical habitat rule, provided these measures are in place within a timreframe consistent with the rulemaking schedule for this regulatory action.

Puu Kukui WP is the largest privately owned watershed preserve in the State. The ML & P Company has proactively managed the preserve since 1988, and joined the State of Hawaii's NAP program in July 1992. The NAP program contract has been continually renewed since that time, and the contract for fiscal years 2012–2018 is scheduled to be renewed in 2011 (ML & P 2010, p. 5; Yuen 2011, in litt.). The primary management goals as outlined in the current Puu Kukui WP management plan for the NAP program, fiscal years 2012–2018 are to: (1) Eliminate ungulate activity in all Puu Kukui WP management units; (2) reduce the range of habitat-modifying weeds and prevent introduction of nonnative plants; (3) track biological and physical resources in the watershed and evaluate changes in these resources over time, including the identification of new threats to the watershed, and provide logistical support to approved research projects that will improve management understanding of the watershed's resources; (4) prevent the extinction of rare species in the watershed; (5) expose the community to projects focusing on preserving and enhancing native plant and animal communities; (6) assist the long-term management of the native ecosystems of west Maui by the WMMWP; and (7) provide adequate manpower and equipment to meet the goals and objectives of the plan. Over 20 years of feral ungulate management has shown that the use of snares and fences has been an effective means of ungulate control, with 60 percent of the preserve not seeing pig activity for 5 or more years. Accessible fences and those with direct ungulate pressure are maintained quarterly. The nonnative plant control program focuses on areas with rare native species, and the maintenance of the most pristine areas, keeping them as weed-free as possible with manual and mechanical control. ML & P Company also supports rare plant monitoring and propagule collection by the PEPP. Natural resource monitoring and research address the need to track biological and physical resources in order to guide management programs. Vegetation is monitored through permanent photo points; nonnative species are monitored along permanent transects; and rare, endemic, and indigenous species are also monitored. The ML & P Company has received funding in eight separate agreements (over $400,000) with the Service to survey for rare plants on their lands and to build feral ungulate control fences for the protection of listed plants. Additionally, logistical and other support for native bird and invertebrate studies by independent researchers and interagency cooperative agreements is provided. However, one area of concern is the lack of management efforts for the proposed endangered *N. cumingi* (ML & P 2009, p. 7). Currently, there is no ongoing predator control in the area where the snail is found.

The ML & P Company is a member of the WMMWP, established in 1998. Management priorities for the partnership include feral animal control, weed control, human activities management, public education and awareness, water and watershed monitoring, and management coordination improvements. The partnership benefits forest conservation by: (1) Enabling land managers to construct fences and remove feral ungulates across land ownership boundaries; (2) allowing for more comprehensive conservation planning; (3) expanding the partners' ability to protect forest lands quickly and efficiently; (4) making more efficient use of resources and staff; (5) allowing for greater unity in attaining public funding; and (6) providing greater access to other funding opportunities. The WMMWP provides annual progress reports regarding the success of management actions and benefits provided to species and watershed habitat.

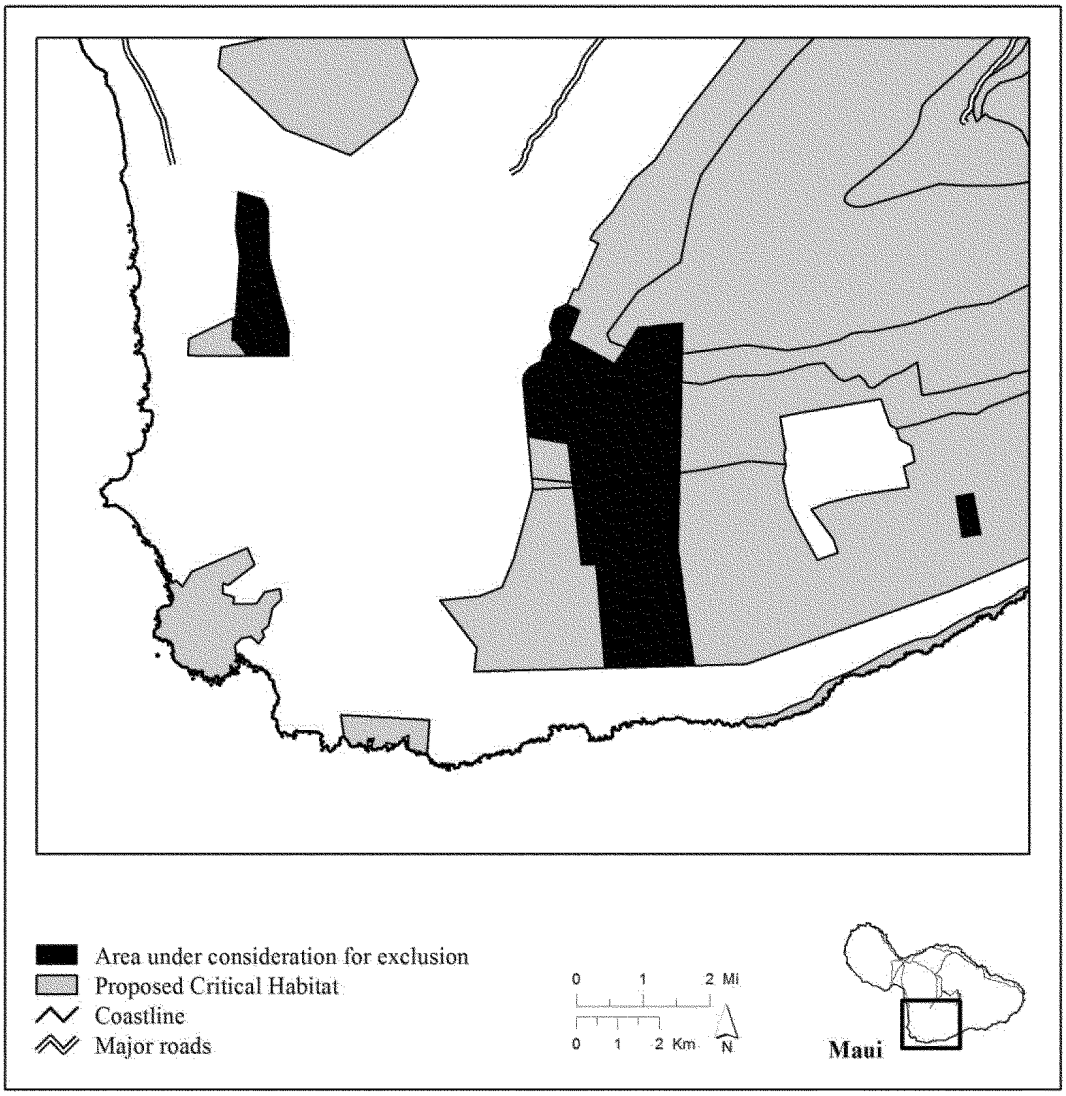
The protection and management of the native plants and their habitats in the Puu Kukui WP that is provided by ML & P Company, the WMMWP, and cooperating landowners and partners providea conservation benefit for 44 endangered and proposed endangered plant species and the endangered akohekohe and kiwikiu, and their associated ecosystems. Designation of critical habitat on these managed lands could be a disincentive to the landowner who has demonstrated a willingness to manage these lands in a manner compatible with the conservation of listed and non-listed species; therefore, we are considering excluding 8,931 ac (3,614 ha) of land owned and managed by ML & P Company from the designation of critical habitat. We are requesting comments and information regarding these areas and will determine whether these lands may warrant exclusion from critical habitat for the 44 plants and 2 animal species (akohekohe and kiwikiu) for which critical habitat is proposed on ML & P Company lands, in our final rule.

Ulupalakua Ranch

The Service is considering excluding 6,537 ac (2,645 ha) of habitat associated with Ulupalakua Ranch lands, on the southwest slope of east Maui (Figure 5).

Figure 5

Ulupalakua Ranch



Eight plant species included in this rule (*Alectryon macrococcus, Cenchrus agrimonioides, Flueggea neowawraea, Hibiscus brackenridgei, Melicope adscendens, M. knudsenii, Santalum haleakalae* var. *lanaiensis,* and *Zanthoxylum hawaiiense*) are reported from this area. The area under consideration falls within six proposed critical habitat units for plants (Maui—Coastal—6, Maui—Lowland Dry—1, Maui—Lowland Dry—3, Maui—Montane Mesic—1, Maui—Montane Dry—1, and Maui—Subalpine—1), and four proposed units for the akohekohe and kiwikiu (*Palmeria dolei*—Unit 18—Montane Mesic, *Pseudonestor xanthophrys*—Unit 18—Montane Mesic, *Palmeria dolei*—Unit 24—Subalpine, and *Pseudonestor xanthophrys*—Unit 24—Subalpine). These units are occupied by the plants *Alectryon macrococcus, Argyroxiphium sandwicense* ssp. *macrocephalum, Asplenium dielerectum, A. peruvianum* var. *insulare, Bidens campylotheca* ssp. *pentamera, B. micrantha* ssp. *kalealaha, Bonamia menziesii, Canavalia pubescens, Cenchrus agrimonioides, Clermontia lindseyana, Cyanea horrida, C. mceldowneyi, C. obtusa, Cyrtandra ferripilosa, C. oxybapha, Diplazium molokaiense, Flueggea neowawraea, Geranium arboreum, G. multiflorum, Hibiscus brackenridgei, Huperzia mannii, Melanthera kamolensis, Melicope adscendens, M. knudsenii, Neraudia sericea, Santalum haleakalae* var. *lanaiense, Sesbania tomentosa, Spermolepis hawaiiensis,* and *Zanthoxylum hawaiiense.* This area contains unoccupied habitat that is essential to the conservation of 17 other endangered or proposed endangered plant species (*Brighamia rockii, Colubrina oppositifolia, Ctenitis squamigera, Cyanea glabra, C. hamatiflora* ssp. *hamatiflora, C. kunthiana, Cyperus pennatiformis, Ischaemum byrone, Melicope mucronulata, Nototrichium humile, Peucedanum sandwicense, Phyllostegia bracteata, P. mannii, Schiedea haleakalensis, Solanum incompletum, Vigna o-wahuensis,* and *Wikstroemia villosa*), and to the akohekohe and kiwikiu.

Ulupalakua Ranch is involved in several important voluntary conservation agreements with the

Service and is currently carrying out activities on their lands for the conservation of rare and endangered species and their habitats. In 1997 and 1998, respectively, Ulupalakua Ranch entered into the Partners for Fish and Wildlife Auwahi and Puu Makua agreements to protect and restore dryland forest, including construction of ungulate exclosure fences, a greenhouse to propagate rare plants for outplanting, an access road, and propagation and outplanting of native plants. Preservation of habitat in Auwahi and Puu Makua benefits the 48 listed and proposed plant and animal species discussed above. Over the last 14 years, the Service has provided funding for 3 projects in the Auwahi area (Auwahi I, II, and III). Labor, material, and technical assistance is provided by Ulupalakua Ranch, U.S. Geological Survery-Biological Resources Discipline (USGS–BRD), and volunteers. The Auwahi I project area encompasses 10 ac (4 ha) on the southwest slope of Haleakala. Ulupalakua Ranch and its partners built an ungulate exclosure fence; outplanted native plants, including the listed endangered plants *Alectryon macrococcus* var. *auwahiensis* and *Zanthoxylum hawaiiense;* and removed all nonnative plants and feral ungulates within the fenced exclosure. The Auwahi II project area encompasses 23 ac (9 ha) adjacent to Auwahi I, and the Auwahi III project area encompasses an additional 181 ac (73 ha) (USFWS 2009, in litt.). Ulupalakua Ranch and its partners built additional ungulate exclosure fences, propagated and outplanted native plants, and removed nonnative plants and feral ungulates within the fenced exclosures (USFWS 2009, in litt.). Within 5 years of fence construction and nonnative species management activities, these three areas have been transformed from nonnative grasslands to a native species-dominated, self-sustaining, dryland forest.

Community volunteer participation is a key element to the success of these projects, and monthly volunteer trips often exceed 50 participants from a pool of 700 interested Maui residents, including school groups, Hawaiian native dance groups, canoe clubs, and other special interest groups.

In 1998, Ulupalakua Ranch entered a 10-year partnership with Ducks Unlimited (a private conservation organization) and the Natural Resources Conservation Service's (NRCS) Wetland Reserve Program (WRP) to create four wetland complexes (completed in 2001) suitable for two endangered birds, the Hawaiian goose or nene (*Branta sandvicensis*) and Hawaiian duck or koloa (*Anas wyvilliana*) (NRCS 2001, pp. 1–2). While the endangered nene and koloa are not addressed in this proposed rule, the establishment of wetland complexes for these endangered birds demonstrates the willingness of Ulupalakua Ranch to protect and conserve native plants and animals on their lands.

Between 1999 and 2007, the Service and the DOFAW NARs Fund provided funding for habitat restoration at Puu Makua. Ulupalakua Ranch and its partners, which include USGS–BRD, the Leeward Haleakala Watershed Restoration Partnership, and volunteers, built a 100-ac (40-ha) ungulate exclosure, removed feral ungulates and controlled nonnative plants within the fenced exclosure, and outplanted native plants. This project provides public outreach through on going volunteer participation to control nonnative plants and outplant native plants.

Impacts to habitat resulting from the installation and operation of eight wind turbines by Auwahi Wind at Ulupalakua Ranch (within an area considered as part of proposed Maui—Lowland Dry—Unit 1) were addressed in a Habitat Conservation Plan. Auwahi Wind will offset the development of 0.3 ac (0.1 ha) of native habitat and 28 ac (11 ha) of degraded habitat with 6 ac (2.4 ha) of habitat restoration at Ulupalakua Ranch's Auwahi project area. The Service issued a section 10 permit for the Auwahi Wind project in January, 2012.

The Honuaula Partners with Ulupalakua Ranch, are offsetting impacts to species from development of an area that is part of proposed Maui—Lowland Dry—Unit 3 in a 400 ac (162 ha) area of Ulupalakua Ranch land above Kanaio NAR.

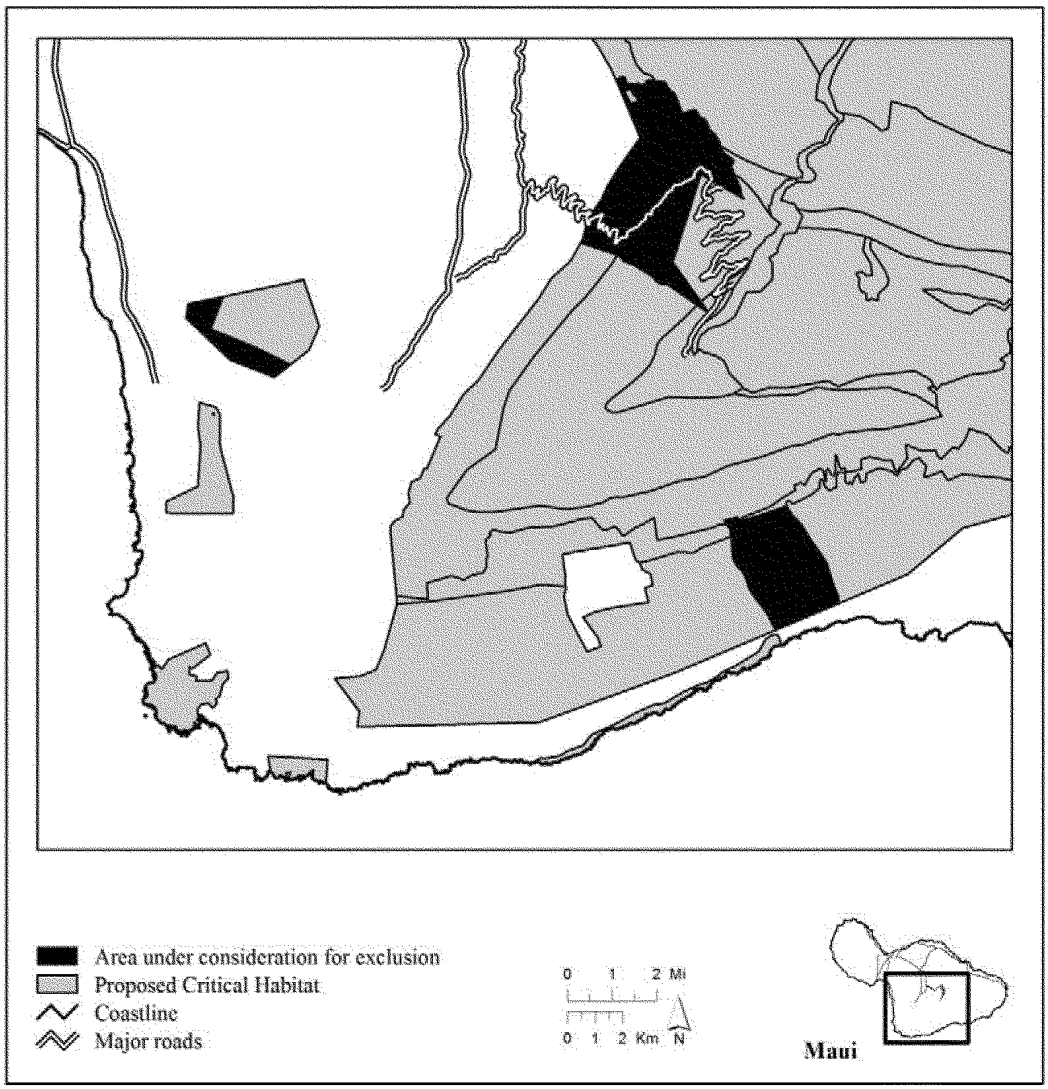
The ongoing management strategies at Auwahi and Puu Makua are consistent with recovery objectives outlined in the recovery plans for the 46 plant species and the akohekohe and kiwikiu (USFWS 1995a; USFWS 1995b; USFWS 1996a; USFWS 1996b; USFWS 1997; USFWS 1998a; USFWS 1998b; USFWS 1998c; USFWS 1999; USFWS 2002; USFWS 2006; 61 FR 53130). Designation of critical habitat on the 6,538 ac (2,644 ha) of Ulupalakua Ranch lands could be a disincentive to the landowner, who has demonstrated a willingness to manage these lands in a manner compatible with the conservation of listed and non-listed species; therefore, we are considering excluding 6,538 ac (2,644 ha) of land owned and managed by Ulupalakua Ranch from the designation of critical habitat. We are requesting comments and information regarding these areas and will determine whether these lands may warrant exclusion from critical habitat for the 48 plants and animals for which critical habitat is proposed on Ulupalakua Ranch lands, in our final rule.

Haleakala Ranch Company

In addition to the Haleakala Ranch Company lands managed by TNC as Waikamoi Preserve under a perpetual conservation easement (see discussion above), the Service is considering excluding 8,746 ac (3,539 ha) of habitat associated with Haleakala Ranch Company lands on east Maui (Figure 6).

Figure 6

Haleakala Ranch



Four plant species included in this rule (*Argyroxiphium sandwicense* ssp. *macrocephalum, Canavalia pubescens, Geranium arboreum,* and *Hibiscus brackenridgei*) and the akohekohe and kiwikiu are reported from this area. The area under consideration falls within seven proposed critical habitat units for plants (Maui—Lowland Dry—1, Maui—Lowland Dry—2, Maui—Montane Wet—1, Maui—Montane Mesic—1, Maui—Montane Dry—1, Maui—Subalpine—1, and Maui—Alpine—1), and six proposed units for the akohekohe and kiwikiu (*Palmeria dolei*—Unit 10—Montane Wet, *Pseudonestor xanthophrys*—Unit 10—Montane Wet, *Palmeria dolei*—Unit 18—Montane Mesic, *Pseudonestor xanthophrys*—Unit 18—Montane Mesic, *Palmeria dolei*—Unit 24—Subalpine, and *Pseudonestor xanthophrys*—Unit 24—Subalpine). These units are occupied by the plants *Alectryon macrococcus, Argyroxiphium sandwicense* ssp. *macrocephalum, Asplenium dielerectum, A. peruvianum* var. *insulare, Bidens campylotheca* ssp. *pentamera, B. micrantha* ssp. *kalealaha, Bonamia menziesii, Canavalia pubescens, Cenchrus agrimonioides, Clermontia lindseyana, C. oblongifolia* ssp. *mauiensis, Cyanea copelandii* ssp. *haleakalensis, C. duvalliorum, C. horrida, C. kunthiana, C. maritae, C. mceldowneyi, C. obtusa, Cyrtandra ferripilosa, C. oxybapha, Diplazium molokaiense, Flueggea neowawraea, Geranium arboreum, G. multiflorum, Hibiscus brackenridgei, Huperzia mannii, Melanthera kamolensis, Melicope adscendens, M. balloui, M. knudsenii, Neraudia sericea, Phyllostegia pilosa, Santalum haleakalae* var. *lanaiense, Sesbania tomentosa, Spermolepis hawaiiensis,* and *Zanthoxylum hawaiiense,* and by the akohekohe and kiwikiu. This area contains unoccupied habitat that is essential to *Adenophorus periens, Bidens campylotheca* ssp. *waihoiensis, Clermontia samuelii, Colubrina oppositifolia, Ctenitis squamigera, Cyanea glabra, C. hamatiflora* ssp. *hamatiflora, Geranium hanaense, Melicope mucronulata, M. ovalis, Nototrichium humile, Peperomia subpetiolata, Phyllostegia bracteata, P. mannii, Platanthera holochila, Schiedea haleakalensis, S. jacobii, Solanum incompletum,* and *Wikstroemia villosa.*

Haleakala Ranch Company is involved in several important voluntary conservation agreements with the Service and is currently carrying out activities on their lands for the conservation of rare and endangered species and their habitats. Haleakala Ranch Company is a member of the EMWP, which was formed in 1991, as a model for large-scale forest protection in Hawaii. The members agree to pool resources and implement a watershed management program to protect 100,000 ac (40,469 ha) of forest across east Maui (EMWP 2009). The management program includes: (1) Control of feral pigs by public hunting in the privately owned lower watershed areas; (2) control of the invasive plant miconia; and (3) construction of ungulate exclosure fences to protect 12,000 ac (4,856 ha) of lowland and montane wet forest (Tri-Isle Resource Conservation and Development Council, Inc. 2011). In partnership with DOFAW, Haleakala Ranch controls feral ungulates (e.g., axis deer and goats) on their lands in lowland dry habitat at Waiopae, on the south coast of east Maui. In addition to feral ungulate control, Haleakala Ranch and DOFAW control invasive plants that threaten wild populations of two endangered plants, *Alectryon macrococcus* and *Melanthera kamolensis*.

In 1999, Haleakala Ranch entered into an agreement with the Partners for Fish and Wildlife, USGS–BRD, and DHHL, for habitat protection at Puu o Kali, on the west slope of Haleakala. This agreement funded management actions to conserve and protect native dryland forest, including construction of a fence to exclude nonnative axis deer and feral goats, nonnative plant control, and propagation and outplanting of native plants. The project area was accessed through cooperation of the landowner, Haleakala Ranch. Currently, 236 ac (96 ha) are protected within the fenced area, and all axis deer and goats were removed from the fenced area.

In 2001, the Service and NRCS provided funding for management actions to conserve and protect the endangered plant *Geranium arboreum* and subalpine habitat on Puu Pahu on the northwestern slopes of Haleakala (USFWS 2007b). These management actions include construction of ungulate exclosure fences and removel of ungulates within the fenced area. The first increment of the fence is completed and encloses approximately 670 ac (271 ha) (Higashino 2011, in litt.). Upon project completion, the fenced area will adjoin the fenced area of Haleakala National Park at 7,500 ft (2,290 m), and will exclude ungulates and allow for their removal from an area larger than 670 ac (271 ha) (USFWS 2007b).

In 2009, Haleakala Ranch entered into a safe harbor agreement (SHA) with the Hawaii DLNR and the Service, to establish a population of the endangered nene on their lands at Waiopae. While the endangered nene is not a species addressed in this proposed rule, the establishment of a SHA for this endangered bird demonstrates the willingness of Haleakala Ranch to protect and conserve native plants and animals on their lands.

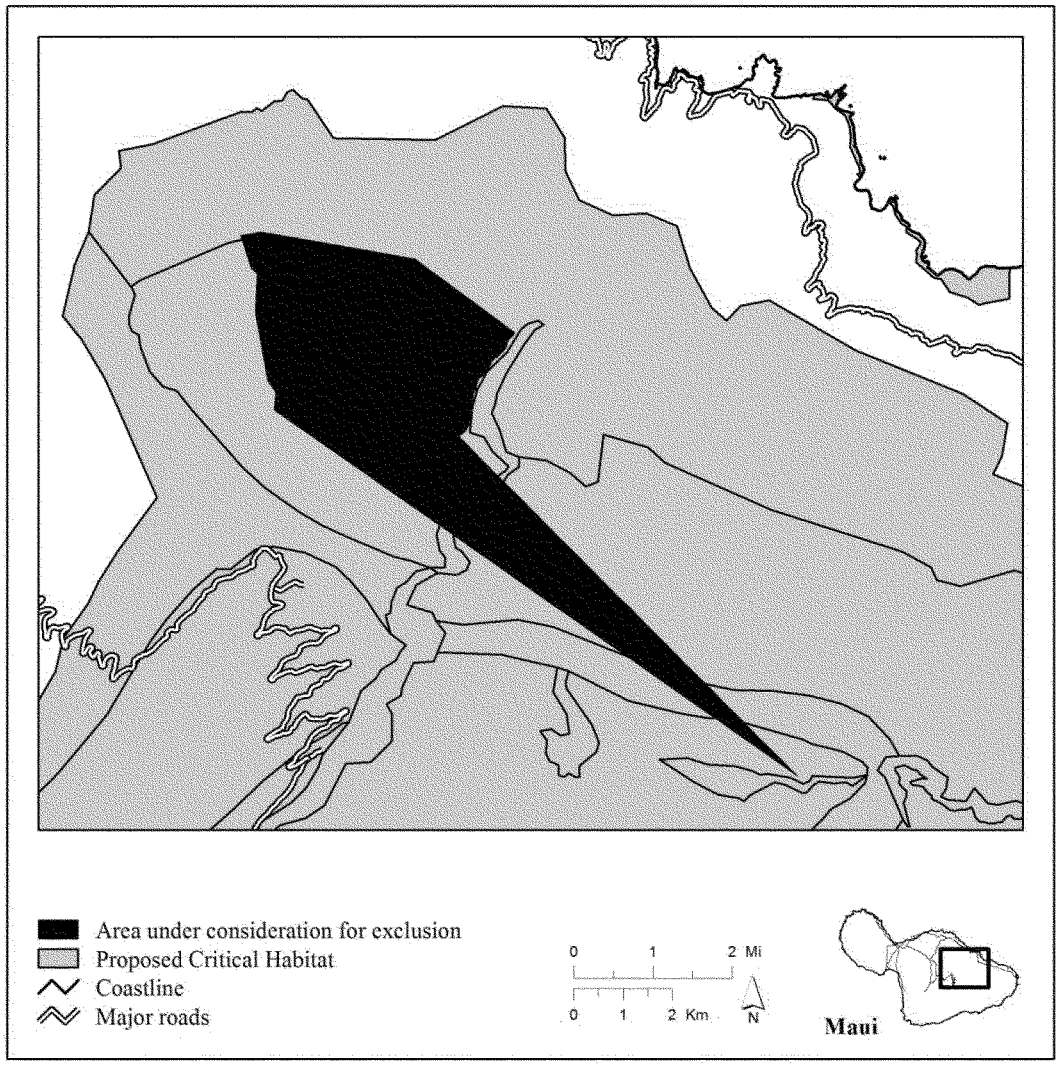
The protection and management of habitat at Puu o Kali, Puu Pahu, and Waiopae are consistent with the recovery objectives outline in the recovery plans for the 55 plant species and the akohekohe and kiwikiu (USFWS 1995a; USFWS 1995b; USFWS 1996a; USFWS 1996b; USFWS 1997; USFWS 1998a; USFWS 1998b; USFWS 1999; USFWS 2002; USFWS 2006; 61 FR 53130). Designation of critical habitat on the 9,796 ac (4,072 ha) of Haleakala Ranch Company lands could be a disincentive to the landowner, who has demonstrated a willingness to manage these lands in a manner compatible with the conservation of listed and non-listed species; therefore, we are considering excluding 8,746 ac (3,539 ha) of land owned and managed by Haleakala Ranch Company from the designation of critical habitat. We are requesting comments and information regarding these areas and will determine whether these lands may warrant exclusion from critical habitat for the 57 plant and animal species for which critical habitat is propose on Haleakala Ranch Company lands, in our final rule.

East Maui Irrigation Company, Ltd.

The Service is considering excluding 6,721 ac (2,720 ha) of habitat associated with East Maui Irrigation Company's (EMI) lands in Haiku Uka (below Waikamoi Preserve, from Opana Gulch to Pohakupalaha) on east Maui (Figure 7).

Figure 7

East Maui Irrigation Company, Ltd.



Ten plant species included in this rule (*Asplenium peruvianum* var. *insulare, Cyanea copelandii* ssp. *haleakalensis, C. gibsonii, C. hamatiflora* ssp. *hamatiflora, C. horrida, C. kunthiana, C. mceldowneyi, Diplazium molokaiense, Geranium multiflorum,* and *Santalum haleakalae* var. *lanaiense*), and the akohekohe and kiwikiu are reported from this area.

The area under consideration falls within 6 proposed critical habitat units for plants (Maui—Lowland Wet—1, Maui—Montane Wet—1, Maui—Montane Wet—2, Maui—Montane Mesic—1, Maui—Subalpine—2, and Maui—Wet Cliff—1), and 12 proposed critical habitat units for the akohekohe and kiwikiu (*Palmeria dolei*—Unit 2—Lowland Wet, *Pseudonestor xanthophrys*—Unit 2–Lowland Wet, *Palmeria dolei*—Unit 10—Montane Wet, *Pseudonestor xanthophrys*—Unit 10—Montane Wet, *Palmeria dolei*—Unit 11—Montane Wet, *Pseudonestor xanthophrys*—Unit 11—Montane Wet, *Palmeria dolei*—Unit 18—Montane Mesic, *Pseudonestor xanthophrys*—Unit 18—Montane Mesic, *Palmeria dolei*—Unit 25—Subalpine, *Pseudonestor xanthophrys*—Unit 25—Subalpine, *Palmeria dolei*—Unit 30—Wet Cliff, and *Pseudonestor xanthophrys*—Unit 30—Wet Cliff). These units are occupied by the plants *Argyroxiphium sandwicense* ssp. *macrocephalum, Asplenium dielerectum, A. peruvianum* var. *insulare, Bidens campylotheca* ssp. *pentamera, B. campylotheca* ssp. *waihoiensis, Clermontia lindseyana, C. oblongifolia* ssp. *mauiensis, C. samuelii, Cyanea asplenifolia, C. copelandii* ssp. *haleakalensis, C. duvalliorum, C. hamatiflora* ssp. *hamatiflora, C. horrida, C. kunthiana, C. maritae, C. mceldowneyi, C. obtusa, Cyrtandra ferripilosa, C. oxybapha, Diplazium molokaiense, Geranium arboreum, G. hanaense, G. multiflorum, Huperzia mannii, Melicope adscendens, M. balloui, M. ovalis, Neraudia sericea, Phyllostegia pilosa, Schiedea haleakalensis,* and *Wikstroemia villosa.* This area contains unoccupied habitat that is essential to the conservation of 15 other plant species (*Adenophorus periens, Alectryon macrococcus, Bidens*

micrantha ssp. *kalealaha, Clermontia peleana, Cyanea glabra, Mucuna sloanei* var. *persericea, Peperomia subpetiolata, Phyllostegia bracteata, P. haliakalae, P. mannii, Plantago princeps, Platanthera holochila, Schiedea jacobii, Solanum incompletum,* and *Zanthoxylum hawaiiense*).

East Maui Irrigation Company, Ltd., a subsidiary of Alexander and Baldwin, owns and operates a ditch system that diverts more than 60 billion gallons per year of surface water from east Maui to central Maui for agricultural, domestic, and other uses. In 1991, EMI, along with the major landowners and land managers (TNC, Maui County, DLNR, and private ranches) of the windward slope of east Maui (encompassing approximately 100,000 ac (40,500 ha)), formed the East Maui Watershed Partnership (EMWP). The EMWP prepared a management plan in 1993, to protect the biological and water resources within the partnership lands (EMWP 2009, App. B). The plan identified five priority management activities: (1) Watershed resource monitoring, (2) feral animal control, (3) invasive weed control, (4) management infrastructure, and (5) public education and awareness programs.

In 1993, EMI and DLNR entered into a right-of-entry agreement to permit the use of EMI roads by public hunters in the area of Haiku Uka, with the intention of increasing hunting activities to control feral pigs, goats, and axis deer in the Koolau FR. In 1996, constituents of the EMWP prepared an ungulate exclusion fencing strategy to preserve and protect 12,000 ac (4,856 ha) of land (called the core area) on the east Maui slope between Hanawi Natural Area Reserve and Koolau Gap, including the Haiku Uka area, and TNC's Waikamoi Preserve (EMWP 2009, p. 3). Approximately 7,000 ac (2,833 ha) of the core area consists of State forest reserve and EMI lands, and approximately 5,000 ac (2,024 ha) are within TNC's Waikamoi Preserve. In 2005 and 2006, the Service and others provided funding for the construction of an ungulate exclusion fence at 3,600 ft (1,100 m) elevation and for improving hunter access to EMWP lands. The fence extends from Hanawi Natural Area Reserve west to Kaupo Gap, and protects approximately 7,000 ac (2,833 ha) of native forest, including forest in Haiku Uka. The Waikamoi Preserve and Haleakala National Park fences provide the upper boundary of the fenced area (TNC 2006l). The fence was completed in 2006, and the enclosed area of 7,000 ac (2,833 ha) is divided into five units (Honomanu, Koolau Gap, Waluanui, Wailuaiki, and Kopiliua), which are managed through the cooperation of landowners, including EMI, and other partners (EMWP 2009, pp. 3–17).

The 1993 EMWP management plan was revised in 2006 and included recommendations for improving threat assessment and feral pig control, and developing more cost-effective methods for natural resource assessments. In 2008 and 2009, the Service provided funding for feral pig reduction and fence monitoring on EMI lands in Haiku Uka (USFWS 2008; USFWS 2009, in litt.).

The 2006 EMWP management plan was revised in 2009, to provide long-term protection of the east Maui watershed resources such as ground and surface water, native plants and animals and their habitat, hunting opportunities, commercial harvests, cultural resources, and ecotourism. The 2009 EMWP management plan provides detailed management objectives for protection of the east Maui watershed resources, and recommends that the effectiveness of ongoing management actions be evaluated and modified, as needed, after 5 years (EMWP 2009, pp. 3–17, + appendices). The 2009 EMWP management plan describes specific management actions for the protection of the EMWP lands, including Haiku Uka. These management actions include ungulate (i.e., feral pigs) control through hunting, fencing, fence maintenance, and research on effective feral animal control actions; weed control by controlling existing weeds, preventing the introduction of new weeds, and supporting research on weed control; development of a management program for rare and endangered species that includes surveys, species monitoring, propagation and outplanting of rare plants and release of rare birds, as well as implementing threat abatement actions; monitoring changes in vegetation (both native and nonnative), native forest birds, stream animals, stream flow, and rainfall; monitoring changes in cultural resources and maintaining and expanding public support for the east Maui watershed; and maintaining existing and developing new funding sources (EMWP 2009, pp. 13–17).

As of 2009, the majority of feral ungulates (i.e., feral pigs) were removed from the five management units (described above). In addition, there are few to no feral pigs in Haiku Uka due to their control by hunting and the construction of exclusion fences (Jokiel 2009, pers. comm.). While native forest dominates Haiku Uka, weed control is ongoing, particularly within disturbance corridors where new weed species are likely to be introduced (e.g., camps, trails, and helicopter landing zones).

The protection and management of the native plants and their habitats in Haiku Uka that is provided by EMI and the EMWP and cooperating landowners and partners provides a conservation benefit for 46 endangered and proposed endangered plant species and the endangered akohekohe and kiwikiu, and their associated ecosystems. Designation of critical habitat on these managed lands could be a disincentive to the landowner, who has demonstrated a willingness to manage these lands in a manner compatible with the conservation of listed and non-listed species; therefore, we are considering excluding 6,721 ac (2,720 ha) of land owned and managed by EMI from the designation of critical habitat. We are requesting comments and information regarding these areas and will determine whether these lands may warrant exclusion from critical habitat for the 46 plant and 2 animal species (akohekohe and kiwikiu) for which critical habitat is proposed on EMI lands, in our final rule.

Peer Review

In accordance with our joint policy published in the **Federal Register** on July 1, 1994 (59 FR 34270), we will seek the expert opinions of at least three appropriate and independent specialists regarding this proposed rule. The purpose of such review is to ensure that our proposed listings and critical habitat designations are based on scientifically sound data, assumptions, and analyses. We have posted our proposed peer review plan on our Web site at *http://www.fws/pacific/informationquality*. We will invite these peer reviewers to comment, during the public comment period, on the specific assumptions and conclusions regarding the proposed listings and designation of critical habitat.

We will consider all comments and information we receive during the comment period on this proposed rule during our preparation of a final determination. Accordingly, our final decision may differ from this proposal.

Public Hearings

The Act provides for one or more public hearings on this proposal, if requested. Requests for public hearings must be made within 45 days of the publication of this proposal (see **DATES**). We will schedule public hearings on this proposal, if any are requested, and announce the dates, times, and place of those hearings, in the **Federal Register** and local newspapers at least 15 days before the first hearing.

Persons needing reasonable accommodations to attend and

participate in a public hearing should contact the Pacific Islands Fish and Wildlife Office at 808–792–9400 as soon as possible. To allow sufficient time to process requests, please call no later than one week before the hearing date. Information regarding this proposal is available in alternative formats upon request.

Required Determinations

Regulatory Planning and Review—Executive Order 12866 and 13563

Executive Order 12866 provides that the Office of Information and Regulatory Affairs (OIRA) will review all significant rules. The Office of Information and Regulatory Affairs has determined that this rule is not significant.

Executive Order 13563 reaffirms the principles of E.O. 12866 while calling for improvements in the nation's regulatory system to promote predictability, to reduce uncertainty, and to use the best, most innovative, and least burdensome tools for achieving regulatory ends. The executive order directs agencies to consider regulatory approaches that reduce burdens and maintain flexibility and freedom of choice for the public where these approaches are relevant, feasible, and consistent with regulatory objectives. E.O. 13563 emphasizes further that regulations must be based on the best available science and that the rulemaking process must allow for public participation and an open exchange of ideas. We have developed this rule in a manner consistent with these requirements.

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

Under the Regulatory Flexibility Act (RFA; 5 U.S.C. 601 *et seq.,* as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996), whenever an agency must publish a notice of rulemaking for any proposed or final rule, it must prepare and make available for public comment a regulatory flexibility analysis that describes the effects of the rule on small entities (small businesses, small organizations, and small government jurisdictions). However, no regulatory flexibility analysis is required if the head of the agency certifies the rule will not have a significant economic impact on a substantial number of small entities. SBREFA amended RFA to require Federal agencies to provide a statement of the factual basis for certifying that the rule will not have a significant economic impact on a substantial number of small entities.

Small entities include small organizations, such as independent nonprofit organizations; small governmental jurisdictions, including school boards and city and town governments that serve fewer than 50,000 residents; and 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 a designation of critical habitat could significantly 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). We apply the ''substantial number'' test individually to each industry to determine if certification is appropriate. However, the SBREFA does not explicitly define ''substantial number'' or ''significant economic impact.'' Consequently, to assess whether a ''substantial number'' of small entities is affected by this designation, this analysis considers the relative number of small entities likely to be impacted in an area. In some circumstances, especially with critical habitat designations of limited extent, we may aggregate across all industries and consider whether the total number of small entities affected is substantial. In estimating the number of small entities potentially affected, we also consider whether their activities have any Federal involvement.

Under the Act, designation of critical habitat only affects activities carried out, funded, or permitted by Federal agencies. Some kinds of activities are unlikely to have any Federal involvement and so will not be affected by critical habitat designation. However, in some States, there are State laws that limit activities in designated critical habitat even where there is no Federal nexus. If there is a Federal nexus, Federal agencies will be required to consult with us under section 7 of the Act on activities they fund, permit, or carry out that may affect critical habitat. If we conclude, in a biological opinion, that a proposed action is likely to destroy or adversely modify 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 destroying or adversely modifying 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 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. We may also identify discretionary conservation recommendations designed to minimize or avoid the adverse effects of a proposed action on critical habitat, help implement recovery plans, or to develop information that could contribute to the recovery of the species.

Within the proposed critical habitat designation, the types of actions or authorized activities that we have identified as potential concerns and that may be subject to consultation under section 7 if there is a Federal nexus are: (1) Activities that might degrade or destroy the primary constituent elements for the species, including, but not limited to (a) grazing, (b) maintaining or increasing feral ungulate levels, (c) clearing or cutting native live trees and shrubs, (d) bulldozing, (e) construction, (f) road building, (g) mining, (h) herbicide application, (i) taking actions that pose a risk of fire; (2) activities that may alter watershed characteristics in ways that would reduce groundwater recharge or alter natural, wetland, aquatic, or vegetative communities (e.g., new water diversion or impoundment activities, groundwater pumping, and manipulation of vegetation through activities such as the ones mentioned above); (3) recreational activities that may degrade vegetation; (4) mining sand or other minerals; (5) introducing or encouraging the spread

of nonnative plant species; (6) importing nonnative species for research, agriculture, and aquaculture; and (7) releasing biological control agents.

Three of the proposed critical habitat units (Maui—Lowland Dry—Unit 3, Maui—Lowland Dry—Unit 5, and Maui—Montane Mesic—Unit 5 (which is also *Palmeria dolei*—Unit 22—Montane Mesic and *Pseudonestor xanthophrys*—Unit 22—Montane Mesic) contain commercial operations or proposed commercial operations. Maui—Lowland Dry—Unit 3 totals approximately 1,089 ac (441 ha) and is located at Paeahu-Palauea on the southern slope of Haleakala on east Maui. Less than 1 ac (0.4 ha) of this unit is owned by Maui County, and 1,089 ac (445 ha) are privately owned. One of the private landowners (Honuaula Partners LLC) plans to develop approximately 130 ac (53 ha) of this unit for a resort and golf-course over a 13-year build-out period and expects to begin within the next few years (PBR Hawaii 2010, pp. 5–6). Honuaula Partners LLC is working with the State's DOFAW and the Service to develop a multi-species habitat conservation plan (HCP), primarily to minimize and mitigate the effects of incidental take of the endangered Blackburn's sphinx moth (*Manduca blackburni*) and Hawaiian hoary bat or ope ape a (*Lasiurus cinereus semotus*), two species that are not addressed in this proposed rule, and to address impacts to the plant *Canavalia pubescens,* which is proposed for listing as endangered in this document. The Service will conduct an internal consultation under section 7 of the Act when considering Honuaula Partners LLC's HCP and application for an incidental take permit for the Blackburn's sphinx moth and ope ape a. In the consultation, the Service considers potential impacts to listed and proposed species, as well as potential impacts to designated and proposed critical habitat. At this time, we are unaware of any other ongoing or proposed project with a Federal nexus (e.g., Federal funds or Federal permits) in this proposed unit.

Maui—Lowland Dry—Unit 5 totals 5,448 ac (2,205 ha) and extends from Panaewa to Waikapu Valley on the western and southern slopes of west Maui. There are 3,685 ac (1,491 ha) of State land and 1,763 ac (713 ha) of private land in this proposed unit. Maui—Montane Mesic—Unit 5 totals 304 ac (123 ha) and is located in the upper reaches of Papalaua and Pohakea gulches on the southeastern slopes of west Maui. Maui—Montane Mesic—Unit 5 is adjacent to and above (to the north of) Maui—Lowland Dry—Unit 5, and consists of 170 ac (69 ha) of State and 134 ac (54 ha) of privately owned lands. Kaheawa Wind Power LLC constructed 20 General Electric 1.5 megawatt wind turbine generators (WTGs) and associated structures, and realigned the existing four-wheel drive road on approximately 200 ac (81 ha) of State-leased land at Kaheawa Pastures, Ukumehame, Maui (called Kaheawa Project I). These WTGs are located in a single articulated row at an elevation extending from 2,000 to 3,000 ft (610 to 915 m) across proposed Maui—Lowland Dry—Unit 5 and Maui—Montane Mesic—Unit 5 (which is also *Palmeria dolei*—Unit 22—Montane Mesic and *Pseudonestor xanthophrys*—Unit 22—Montane Mesic). Kaheawa Wind Power LLC worked with the State's DOFAW and the Service to develop a multi-species HCP, primarily to minimize and mitigate the effects of incidental take of three federally listed birds (the endangered nene, endangered Hawaiian dark-rumped petrel or ua u (*Pterodroma phaeopygia sandwichensis*), and the threatened Newell Townsend's shearwater or ao (*Puffinus auricularis newelli*)), and the endangered ope ape a. The Service conducted an internal consultation under section 7 of the Act on impacts of the proposed Kaheawa Project I on the four federally listed species and previously designated plant critical habitat prior to issuing the incidental take permit. Kaheawa Wind Power LLC plans to construct and operate 14 new 1.5 MW WTGs and associated structures on 143 ac (58 ha) of State-leased land (called Kaheawa Project II), approximately 2,000 ft (approximately 610 m) southeast of the southern end of Kaheawa Project I (outside of proposed critical habitat in Maui—Lowland—Dry Unit 5). Kaheawa Project II also includes plans to construct and operate a new maintenance building on 2 ac (0.8 ha) of State-leased land within proposed Maui—Lowland Dry—Unit 5. Kaheawa Wind Power LLC is working with the State's DOFAW and the Service to develop a multi-species HCP for Kaheawa Project II, primarily to minimize and mitigate the effects of incidental take of the federally listed nene, ua u, ao, and ope ape a. The Service conducted an internal consultation under section 7 of the Act on impacts of the proposed Kaheawa Project II on these four listed species, and issued a permit for construction and operation of the wind towers in January, 2012.

None of the other 97 plant, 86 forest bird, and 11 tree snail proposed critical habitat units contains any significant residential, commercial, industrial, or golf-course projects; crop farming; or intensive livestock operations. Few projects are planned for locations in these other proposed critical habitat units. This situation reflects the fact that:

(1) Most of the land is unsuitable for development, farming, or other economic activities due to the rugged mountain terrain, lack of access, and remote locations; and

(2) Existing land-use controls severely limit development and most other economic activities in the mountainous interiors of the islands of Molokai, Lanai, Maui, and Kahoolawe.

Existing and planned projects, land uses, and activities that could affect the proposed critical habitat but have no Federal involvement would not require section 7 consultation with the Service, so they are not restricted by the requirements of the Act. Further, although some existing and continuing activities involve the operation and maintenance of existing manmade features and structures (e.g., wind turbines and associated structures) in certain areas, these areas do not contain the physical or biological features for the species, and would not be impacted by the designation. Finally, for the anticipated projects and activities that will have Federal involvement, many are conservation efforts that will not negatively impact the species or their habitat, so they will not be subjected to a protracted informal section 7 consultation. We anticipate that a developer or other project proponent could modify a project or take measures to protect the 135 Maui Nui species. The kinds of actions that may be included if future reasonable and prudent alternatives become necessary include conservation set-asides, management of competing nonnative species, restoration of degraded habitat, and regular monitoring. These measures are not likely to result in a significant economic impact to project proponents, as nearly all of the lands proposed for critical habitat designation are unsuitable for development, as well as for most commercial projects, land uses, and activities. This is due to their remote location, lack of access, and rugged terrain.

In addition, Federal agencies may also need to reinitiate a previous consultation if discretionary involvement or control over the Federal action has been retained or is authorized by law and the activities may affect critical habitat. On November 9, 1984, we designated critical habitat for the endangered plant *Gouania hillebrandii* on Maui (49 FR 44753), and in 2003 and

2008, we designated critical habitat for 3 plants on Lanai (68 FR 1220; January 9, 2003); 41 plants on Molokai (68 FR 12982; March 18, 2003); 60 plants on Maui and Kahoolawe (68 FR 25934; May 14, 2003); Blackburn's sphinx moth on Molokai, Maui, and Kahoolawe, and the island of Hawaii (68 FR 34710; June 10, 2003); and, most recently, for 12 picture-wing flies on Kauai, Oahu, Molokai, Maui, and Hawaii (73 FR 73794; December 4, 2008). We discuss our formal and informal consultations conducted prior to 2003 on the islands of Lanai, Molokai, Maui, and Kahoolawe in our final rules to designate critical habitat on these islands (68 FR 1220, January 9, 2003; 68 FR 12982, March 18, 2003; 68 FR 25934, May 14, 2003). Since the 2003 critical habitat designations on Lanai, Molokai, Maui, and Kahoolawe, and most recently in December 2008 on Molokai and Maui, we have conducted 17 formal consultations and 81 informal consultations on these islands (Table 8), in addition to consultations on Federal grants to State wildlife programs that do not affect small entities. Of these 98 formal and informal consultations, 10 formal consultations and 32 informal consultations were primarily consultations regarding Federal permits to Service employees to implement conservation actions for listed species. The remainder, 7 formal consultations and 49 informal consultations, involved (in order of frequency) the Department of Agriculture (USDA–NRCS, USDA–Emergency Conservation Program (ECP), USDA–Animal and Plant Health Inspection Service (APHIS), USDA–Farm Services Agency (FSA), and USDA–Emergency Watershed Program (EWP), U.S.Army Corps of Engineers, Federal Communications Commission (FCC), Environmental Protection Agency, National Science Foundation, Department of Housing and Urban Development, NPS, Sprint Nextel, U.S. Navy, U.S. Air Force, University of Hawaii-Institute for Astronomy, U.S. Coast Guard, Hawaii Army National Guard, USGS–BRD, and Maui Electric Company (MECO).

TABLE 8—SUMMARY OF CONSULTATIONS ON MOLOKAI, LANAI, MAUI AND KAHOOLAWE BETWEEN 2003 AND 2010

Island	Total No. of informal consultations	Total No. of informal consultations concerning critical habitat	Total No. of formal consultations	Total No. of formal consultations concerning critical habitat
Molokai	17	3	2	0
Lanai	3	0	1	0
Maui	58	7	10	1
Kahoolawe	3	2	1	1
Multi-Island (includes one or more islands)	0	0	3	0
Total for all islands	81	12	17	2

Two of the formal consultations concerned designated critical habitat, and we concurred with each agency's determination that the project, as proposed, was not likely to destroy or adversely modify critical habitat. One of the formal consultations was conducted on behalf of the U.S. Navy regarding controlled burns at Waikahalulu and Kamohio on the island of Kahoolawe. The U.S. Navy proposed to reduce and remove vegetation cover (by fire) in plant and Blackburn's sphinx moth critical habitat so that Navy contractors could safely locate unexploded ordinance (UXO) for removal and disposal. Although the controlled burn was carried out in an area that is also proposed for critical habitat in this rule, it was a single, one-time action that is not ongoing. The U.S. Navy ceased UXO removal operations on Kahoolawe in 2004. The other formal consultation is discussed above (see Kaheawa Project I). The Service may need to reinitiate internal consultation on future actions proposed (Kaheawa Project II) in Maui—Lowland Dry—Unit 5 and Maui—Montane Mesic—Unit 5, if those actions may affect subsequently newly designated critical habitat.

The majority of the 49 informal consultations that did not involve Service actions was related to project effects on seabird flyways, listed species and their associated habitats, and human interactions with endangered nene. About one third of the informal consultations was conducted with the USDA for proposed funding for habitat restoration projects under NRCS programs such as the Wetland Reserve Program, Wildlife Habitat Incentives Program, and Environmental Quality Incentives Program, and the remaining consultations were agricultural projects under the FSA's Emergency Conservation Program.

Twelve of the 81 informal consultations concerned designated critical habitat, and in all cases we concurred with each agency's determination that the project, as proposed, had no effect or was not likely to adversely modify critical habitat. These projects were evenly divided between conservation actions that would benefit listed species, construction, and agricultural operations. For the 69 informal consultations that did not concern designated critical habitat, we concurred with each agency's determination that the project, as proposed, was not likely to adversely affect listed species.

In this rule, we are proposing to designate critical habitat on a total 271,062 ac (109,695 ha) of land. Forty-seven percent (127,807 ac (51,722 ha)) of this proposed critical habitat designation is already designated critical habitat for one or more species, and 53 percent (143,272 ac (57,980 ha)) of the proposed designation is on land newly proposed as critical habitat. Some of the Federal actions that were subject to previous section 7 consultation are on the lands we are proposing as critical habitat in this rule. Therefore, there may be a requirement to reinitiate consultation for some ongoing Federal projects.

In the 2003 and 2008 economic analyses of the previous designation of critical habitat for the 102 species of plants on the islands of Lanai, Molokai, Maui, and Kahoolawe; Blackburn's sphinx moth; and 12 picture-wing flies, we evaluated the potential economic effects on small business entities resulting from the protection of these species and their habitats related to the proposed designation of critical habitat and determined that it would not have a significant economic impact on a substantial number of small entities. The RFA/SBREFA defines ''small governmental jurisdiction'' as the government of a city, county, town, school district, or special district with a population of less than 50,000. By this

definition, Maui County is not a small governmental jurisdiction because its population was estimated at 145,157 residents in 2009. Certain State agencies may be affected by the proposed critical habitat designation—such as the Department of Land and Natural Resources and the State Department of Transportation. However, for the purposes of the RFA, State governments are considered independent sovereigns, not small governments. The overlap between the previous critical habitat designations for the 102 plant species, Blackburn's sphinx moth, and 2 of the 12 picture-wing flies and this proposed critical habitat designation is further evidence that this proposal is not likely to have a significant economic impact on a substantial number of small entities.

We have made an initial RFA finding that the proposed designation of critical habitat for the 135 species will not have a significant effect on a substantial number of small entities, for the reasons described above. However, we will defer making a final RFA finding in order to allow the public an opportunity to comment on potential economic consequences of this critical habitat proposal.

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.*), we make the following findings:

(a) This rule would not produce a Federal mandate. In general, a Federal mandate is a provision in legislation, statute, or regulation that would impose an enforceable duty upon State, local, or tribal governments, or the private sector, and includes both ''Federal intergovernmental mandates'' and ''Federal private sector mandates.'' These terms are defined in 2 U.S.C. 658(5)–(7). ''Federal intergovernmental mandate'' includes a regulation that ''would impose an enforceable duty upon State, local, or tribal governments'' with two exceptions. It excludes ''a condition of Federal assistance.'' It also excludes ''a duty arising from participation in a voluntary Federal program,'' unless the regulation ''relates to a then-existing Federal program under which $500,000,000 or more is provided annually to State, local, and tribal governments under entitlement authority,'' if the provision would ''increase the stringency of conditions of assistance'' or ''place caps upon, or otherwise decrease, the Federal Government's responsibility to provide funding,'' and the State, local, or tribal governments ''lack authority'' to adjust accordingly. At the time of enactment, these entitlement programs were: Medicaid; AFDC work programs; Child Nutrition; Food Stamps; Social Services Block Grants; Vocational Rehabilitation State Grants; Foster Care, Adoption Assistance, and Independent Living; Family Support Welfare Services; and Child Support Enforcement. ''Federal private sector mandate'' includes a regulation that ''would impose an enforceable duty upon the private sector, except (i) a condition of Federal assistance or (ii) a duty arising from participation in a voluntary Federal program.''

The designation of critical habitat does not impose a legally binding duty on non-Federal Government entities or private parties. Under the Act, the only regulatory effect is that Federal agencies must ensure that their actions do not destroy or adversely modify critical habitat under section 7. While non-Federal entities that receive Federal funding, assistance, or permits, or that otherwise require approval or authorization from a Federal agency for an action, may be indirectly impacted by the designation of critical habitat, the legally binding duty to avoid destruction or adverse modification of critical habitat rests squarely on the Federal agency. Furthermore, to the extent that non-Federal entities are indirectly impacted because they receive Federal assistance or participate in a voluntary Federal aid program, the Unfunded Mandates Reform Act would not apply, nor would critical habitat shift the costs of the large entitlement programs listed above onto State governments.

(b) We do not believe that this rule would significantly or uniquely affect small governments. The lands we are proposing for critical habitat designation are owned by the County of Maui, the State of Hawaii, private citizens, and the Federal government. None of these entities fit the definition of ''small governmental jurisdiction.'' Therefore, a Small Government Agency Plan is not required. However, we will further evaluate this issue as we conduct our economic analysis, and we will review and revise this assessment as warranted.

Takings—Executive Order 12630

In accordance with E.O. 12630 (Government Actions and Interference with Constitutionally Protected Private Property Rights), we have analyzed the potential takings implications of designating critical habitat for each of the 135 species in a takings implications assessment. The takings implications assessment concludes that this designation of critical habitat for each of these species does not pose significant takings implications for lands within or affected by the proposed designation.

Federalism—Executive Order 13132

In accordance with E.O. 13132 (Federalism), this proposed rule does not have significant Federalism effects. A Federalism summary impact statement is not required. In keeping with Department of the Interior and Department of Commerce policy, we requested information from, and coordinated development of, this proposed critical habitat designation with appropriate State resource agencies in Hawaii. The critical habitat designation may have some benefit to these governments because the areas that contain the features essential to the conservation of the species would be more clearly defined, and the essential features themselves are specifically identified. While making this definition and identification does alter where and what federally sponsored activities may occur, it may assist local governments in long-range planning (rather than having them wait for case-by-case section 7 consultations to occur).

Where State and local governments require approval or authorization from a Federal agency for actions that may affect critical habitat, consultation under section 7(a)(2) would be required. While non-Federal entities that receive Federal funding, assistance, or permits, or that otherwise require approval or authorization from a Federal agency for an action, may be indirectly impacted by the designation of critical habitat, the legally binding duty to avoid destruction or adverse modification of critical habitat rests squarely on the Federal agency.

Civil Justice Reform—Executive Order 12988

In accordance with E.O. 12988 (Civil Justice Reform), the Office of the Solicitor has determined that the rule does not unduly burden the judicial system and that it meets the requirements of sections 3(a) and 3(b)(2) of the Order. We proposed designating critical habitat in accordance with the provisions of the Act. This proposed rule uses standard property descriptions and identifies the physical and biological features within the designated areas to assist the public in understanding the habitat needs of each of the species being considered in this proposed rule.

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

This rule does not contain any new collections of information that require

approval by Office of Management and Budget (OMB) under the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 *et seq.*). This rule will not impose recordkeeping or reporting requirements on State or local governments, individuals, businesses, or organizations. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number.

National Environmental Policy Act (NEPA)

It is our position that, outside the jurisdiction of the Circuit Court of the United States for the Tenth Circuit, we do not need to prepare environmental analyses as defined by NEPA (42 U.S.C. 4321 *et seq.*) in connection with designating critical habitat under the Act. We published a notice outlining our reasons for this determination in the **Federal Register** on October 25, 1983 (48 FR 49244). This assertion was upheld by the U.S. Court of Appeals for the Ninth Circuit (*Douglas County* v. *Babbitt,* 48 F.3d 1495 (9th Cir. 1995), cert. denied 516 U.S. 1042 (1996)).

Clarity of the Rule

We are required by Executive Orders 12866 and 12988 and by the Presidential Memorandum of June 1, 1998, to write all rules in plain language. This means that each rule we publish must:

(a) Be logically organized;

(b) Use the active voice to address readers directly;

(c) Use clear language rather than jargon;

(d) Be divided into short sections and sentences; and

(e) Use lists and tables wherever possible.

If you feel that we have not met these requirements, send us comments by one of the methods listed in the **ADDRESSES** section. To better help us revise the rule, your comments should be as specific as possible. For example, you should tell us the numbers of the sections or paragraphs that are unclearly written, which sections or sentences are too long, the sections where you feel lists or tables would be useful, etc.

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), E.O. 13175, and the Department of Interior's manual at 512 DM2, we readily acknowledge our responsibility to communicate meaningfully with recognized Federal Tribes on a government-to-government basis. In accordance with Secretarial Order 3206 of June 5, 1997 ''American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act,'' we readily acknowledge our responsibilities to work directly with Tribes in developing programs for healthy ecosystems, to acknowledge that tribal lands are not subject to the same controls as Federal public lands, to remain sensitive to Indian culture, and to make information available to Tribes.

We have determined that there are no tribal lands occupied at the time of listing that contain the features essential for the conservation, and no tribal lands that are essential for the conservation, of the 135 species. Therefore, we have not proposed designation of critical habitat for any of the 135 species on tribal lands.

Energy Supply, Distribution, or Use

On May 18, 2001, the President issued an Executive Order (E.O. 13211; Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use) 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. This proposed rule to designate critical habitat for 135 species is not a significant regulatory action under E.O. 12866, and we do not expect it to significantly affect energy supplies, distribution, or use. When determining critical habitat boundaries within this proposed rule, we made every effort to avoid including developed areas such as buildings, paved areas, and other structures that lack the physical or biological features essential for the conservation of the 135 species. The scale of the maps we prepared under the parameters for publication within the Code of Federal Regulations may not reflect the exclusion of such developed areas. Any such structures and the land under them inadvertently left inside critical habitat boundaries shown on the maps of this proposed rule have been excluded by text in the proposed rule and are not proposed for designation as critical habitat. A wind energy generation facility operated by Kaheawa Wind Power LLC spans a portion of Maui—Lowland Dry—Unit 5 and Maui—Montane Mesic—Unit 5. This man made facility does not provide the physical or biological features essential to the conservation of the species and, therefore, is not included in the proposed designation. Therefore, this action is not a significant energy action, and no Statement of Energy Effects is required. However, we will further evaluate this issue as we conduct our economic analysis, and we will review and revise this assessment as warranted.

References Cited

A complete list of references cited in this rule is available on the Internet at *http://www.regulations.gov* and upon request from the Pacific Islands Fish and Wildlife Office (see **FOR FURTHER INFORMATION CONTACT**, above).

Authors

The primary authors of this document are the staff members of the Pacific Islands Fish and Wildlife Office.

List of Subjects in 50 CFR part 17

Endangered and threatened species, Exports, Imports, Reporting and recordkeeping requirements, Transportation.

Proposed Regulation Promulgation

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

PART 17—ENDANGERED AND THREATENED WILDLIFE AND PLANTS

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 § 17.11(h), the List of Endangered and Threatened Wildlife, as follows:

a. By revising the entries for ''Honeycreeper, crested'' and ''Parrotbill, Maui (honeycreeper)'' under BIRDS to read as set forth below; and

b. By adding entries for ''Snail, Lanai tree'' (*Partulina semicarinata*), ''Snail, Lanai tree'' (*Partulina variabilis*), and ''Snail, Newcomb's tree'' (*Newcombia cumingi*), in alphabetical order under SNAILS, to read as set forth below.

§ 17.11 Endangered and threatened wildlife.

* * * * *

(h) * * *

Species		Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Common name	Scientific name						
*	*	*	*	*	*		*
BIRDS							
*	*	*	*	*	*		*
Honeycreeper, crested (Akohekohe).	*Palmeria dolei*	U.S.A. (HI)	Entire	E	1	17.95(b)	NA
*	*	*	*	*	*		*
Parrotbill, Maui (Kiwikiu).	*Pseudonestor xanthophrys.*	U.S.A. (HI)	Entire	E	1	17.95(b)	NA
*	*	*	*	*	*		*
SNAILS							
*	*	*	*	*	*		*
Snail, Lanai tree	*Partulina semicarinata.*	U.S.A. (HI)	NA	E		17.95(f)	NA
*	*	*	*	*	*		*
Snail, Lanai tree	*Partulina variabilis*	U.S.A. (HI)	NA	E		17.95(f)	NA
*	*	*	*	*	*		*
Snail, Newcomb's tree	*Newcombia cumingi*	U.S.A. (HI)	NA	E		17.95(f)	NA
*	*	*	*	*	*		*

3. Amend § 17.12(h), the List of Endangered and Threatened Plants, as follows:

a. By removing the entries for *Centaurium sebaeoides, Cyanea dunbarii, Cyanea macrostegia* ssp. *gibsonii, Gahnia lanaiensis, Hedyotis schlechtendahliana* var. *remyi, Hedyotis mannii, Lipochaeta kamolensis,* and *Mariscus fauriei* under FLOWERING PLANTS;

b. By revising the entries for *Abutilon eremitopetalum, Acaena exigua, Bidens micrantha* ssp. *kalealaha, Bonamia menziesii, Brighamia rockii, Cenchrus agrimonioides, Clermontia oblongifolia* ssp. *mauiensis, Clermontia peleana, Cyanea grimesiana* ssp. *grimesiana, Cyanea lobata, Cyperus trachysanthos, Cyrtandra munroi, Gouania hillebrandii, Hesperomannia arborescens, Hibiscus brackenridgei, Kokia cookei, Labordia tinifolia* var. *lanaiensis, Melicope mucronulata, Melicope munroi, Neraudia sericea, Phyllostegia hispida, Platanthera holochila, Portulaca sclerocarpa, Sesbania tomentosa, Silene lanceolata, Solanum incompletum, Spermolepis hawaiiensis, Tetramolopium lepidotum* ssp. *lepidotum, Tetramalopium remyi, Vigna o-wahuensis, Viola lanaiensis,* and *Zanthoxylum hawaiiense* under FLOWERING PLANTS, to read as set forth below;

c. By adding entries for *Bidens campylotheca* ssp. *pentamera, Bidens campylotheca* ssp. *waihoiensis, Bidens conjuncta, Calamagrostis hillebrandii, Canavalia pubescens, Cyanea asplenifolia, Cyanea dunbariae, Cyanea duvalliorum, Cyanea gibsonii, Cyanea horrida, Cyanea kunthiana, Cyanea magnicalyx, Cyanea maritae, Cyanea mauiensis, Cyanea munroi, Cyanea obtusa, Cyanea profuga, Cyanea solanacea, Cyperus fauriei, Cyrtandra ferripilosa, Cyrtandra filipes, Cyrtandra oxybapha, Festuca molokaiensis, Geranium hanaense, Geranium hillebrandii, Kadua cordata* ssp. *remyi, Kadua laxiflora, Melanthera kamolensis, Mucuna sloanei* var. *persericea, Myrsine vaccinioides, Peperomia subpetiolata, Phyllostegia bracteata, Phyllostegia haliakalae, Phyllostegia pilosa, Pittosporum halophilum, Pleomele fernaldii, Santalum haleakalae* var. *lanaiense, Schenkia sebaeoides, Schiedea jacobii, Schiedea laui, Schiedea salicaria, Stenogyne kauaulaensis,* and *Wikstroemia villosa* in alphabetical order under FLOWERING PLANTS, to read as set forth below;

d. By removing the entries for *Asplenium fragile* var. *insulare, Diellia erecta,* and *Phlegmariurus mannii* under FERNS AND ALLIES;

e. By revising the entries for *Adenophorus periens, Ctenitis squamigera, Diplazium molokaiense, Huperzia manii,* and *Marsilea villosa,* under FERNS AND ALLIES to read as set forth below; and

f. By adding entries for *Asplenium dielerectum* and *Asplenium peruvianum* var. *insulare,* in alphabetical order under FERNS AND ALLIES, 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							

Species		Historic range	Family	Status	When listed	Critical habitat	Special rules
Scientific name	Common name						
*	*	*	*	*	*		*
Abutilon eremitopetalum.	None	U.S.A. (HI)	Malvaceae	E	435	17.99(m)	NA
*	*	*	*	*	*		*
Acaena exigua	Liliwai	U.S.A. (HI)	Rosaceae	E	467	17.99(e)(1)	NA
*	*	*	*	*	*		*
Bidens campylotheca ssp. *pentamera.*	Kookoolau	U.S.A. (HI)	Asteraceae	E		17.99(e)(1)	NA
*	*	*	*	*	*		*
Bidens campylotheca ssp. *waihoiensis.*	Kookoolau	U.S.A. (HI)	Asteraceae	E		17.99(e)(1)	NA
*	*	*	*	*	*		*
Bidens conjuncta	Kookoolau	U.S.A. (HI)	Asteraceae	E		17.99(e)(1)	NA
*	*	*	*	*	*		*
Bidens micrantha ssp. *kalealaha.*	Kookoolau	U.S.A. (HI)	Asteraceae	E	467	17.99(e)(1), (m)	NA
*	*	*	*	*	*		*
Bonamia menziesii	None	U.S.A. (HI)	Convolvulaceae	E	559	17.99(a)(1), (c), (e)(1), (i), (k), (m)	NA
*	*	*	*	*	*		*
Brighamia rockii	Pua ala	U.S.A. (HI)	Campanulaceae	E	480	17.99(c), (e)(1), (m)	NA
*	*	*	*	*	*		*
Calamagrostis hillebrandii.	None	U.S.A. (HI)	Poaceae	E		17.99(e)(1)	NA
*	*	*	*	*	*		*
Canavalia pubescens	Awikiwiki	U.S.A. (HI)	Fabaceae	E		17.99(e)(1), (m)	NA
*	*	*	*	*	*		*
Cenchrus agrimonioides.	Kamanomano, (=Sandbur, agrimony).	U.S.A. (HI)	Poaceae	E	592	17.99(e)(1), (i), (m)	NA
*	*	*	*	*	*		*
Clermontia oblongifolia ssp. *mauiensis.*	Oha wai	U.S.A. (HI)	Campanulaceae	E	467	17.99(e)(1), (m)	NA
*	*	*	*	*	*		*
Clermontia peleana	Oha wai	U.S.A. (HI)	Campanulaceae	E	532	17.99(e)(1), (k)	NA
*	*	*	*	*	*		*
Cyanea asplenifolia	Haha	U.S.A. (HI)	Campanulaceae	E		17.99(e)(1)	NA
*	*	*	*	*	*		*
Cyanea dunbariae	Haha	U.S.A. (HI)	Campanulaceae	E	594	17.99(c)	NA
*	*	*	*	*	*		*
Cyanea duvalliorum	Haha	U.S.A. (HI)	Campanulaceae	E		17.99(e)(1)	NA
*	*	*	*	*	*		*
Cyanea gibsonii	Haha	U.S.A. (HI)	Campanulaceae	E	435	17.99(m)	NA
*	*	*	*	*	*		*
Cyanea grimesiana ssp. *grimesiana.*	Haha	U.S.A. (HI)	Campanulaceae	E	592	17.99(c), (i)	NA
*	*	*	*	*	*		*
Cyanea horrida	Haha nui	U.S.A. (HI)	Campanulaceae	E		17.99(e)(1)	NA
*	*	*	*	*	*		*
Cyanea kunthiana	Haha	U.S.A. (HI)	Campanulaceae	E		17.99(e)(1)	NA

Species		Historic range	Family	Status	When listed	Critical habitat	Special rules
Scientific name	Common name						
*	*	*	*	*	*	*	
Cyanea lobata	Haha	U.S.A. (HI)	Campanulaceae	E	467	17.99(e)(1), (m)	NA
*	*	*	*	*	*	*	
Cyanea magnicalyx	Haha	U.S.A. (HI)	Campanulaceae	E		17.99(e)(1)	NA
*	*	*	*	*	*	*	
Cyanea maritae	Haha	U.S.A. (HI)	Campanulaceae	E		17.99(e)(1)	NA
*	*	*	*	*	*	*	
Cyanea mauiensis	Haha	U.S.A. (HI)	Campanulaceae	E		NA	NA
*	*	*	*	*	*	*	
Cyanea munroi	Haha	U.S.A. (HI)	Campanulaceae	E		17.99(c), (m)	NA
*	*	*	*	*	*	*	
Cyanea obtusa	Haha	U.S.A. (HI)	Campanulaceae	E		17.99(e)(1)	NA
*	*	*	*	*	*	*	
Cyanea profuga	Haha	U.S.A. (HI)	Campanulaceae	E		17.99(c)	NA
*	*	*	*	*	*	*	
Cyanea solanacea	Popolo	U.S.A. (HI)	Campanulaceae	E		17.99(c)	NA
*	*	*	*	*	*	*	
Cyperus fauriei	None	U.S.A. (HI)	Cyperaceae	E	532	17.99(c), (m), (k)	NA
*	*	*	*	*	*	*	
Cyperus trachysanthos.	Puukaa	U.S.A. (HI)	Cyperaceae	E	592	17.99(a)(1), (c), (i), (m)	NA
*	*	*	*	*	*	*	
Cyrtandra ferripilosa	Haiwale	U.S.A. (HI)	Gesneriaceae	E		17.99(e)(1)	NA
*	*	*	*	*	*	*	
Cyrtandra filipes	Haiwale	U.S.A. (HI)	Gesneriaceae	E		17.99(c), (e)(1)	NA
*	*	*	*	*	*	*	
Cyrtandra munroi	Haiwale	U.S.A. (HI)	Gesneriaceae	E	467	17.99(e)(1), (m)	NA
*	*	*	*	*	*	*	
Cyrtandra oxybapha	Haiwale	U.S.A. (HI)	Gesneriaceae	E		17.99(e)(1)	NA
*	*	*	*	*	*	*	
Festuca molokaiensis	None	U.S.A. (HI)	Poaceae	E		17.99(c)	NA
*	*	*	*	*	*	*	
Geranium hanaense	Nohoanu	U.S.A. (HI)	Geraniaceae	E		17.99(e)(1)	NA
*	*	*	*	*	*	*	
Geranium hillebrandii	Nohoanu	U.S.A. (HI)	Geraniaceae	E		17.99(e)(1)	NA
*	*	*	*	*	*	*	
Gouania hillebrandii	None	U.S.A. (HI)	Rhamnaceae	E	165	17.99(c), (e)(1), (e)(2)	NA
*	*	*	*	*	*	*	
Hesperomannia arborescens.	None	U.S.A. (HI)	Asteraceae	E	536	17.99(c), (e)(1), (i), (m)	NA
*	*	*	*	*	*	*	
Hibiscus brackenridgei	Mao hau hele	U.S.A. (HI)	Malvaceae	E	559	17.99(c), (e)(1), (e)(2), (i), (k), (m)	NA

Species		Historic range	Family	Status	When listed	Critical habitat	Special rules
Scientific name	Common name						
*	*	*	*	*	*	*	
Kadua cordata ssp. *remyi*.	Kopa	U.S.A. (HI)	Rubiaceae	E	666	17.99(m)	NA
*	*	*	*	*	*	*	
Kadua laxiflora	Pilo	U.S.A. (HI)	Rubiaceae	E	480	17.99(c), (e)(1), (m)	NA
*	*	*	*	*	*	*	
Kokia cookei	Cooke's kokio	U.S.A. (HI)	Malvaceae	E	74	17.99(c)	NA
*	*	*	*	*	*	*	
Labordia tinifolia var. *lanaiensis*.	Kamakahala	U.S.A. (HI)	Loganiaceae	E	666	17.99(m)	NA
*	*	*	*	*	*	*	
Melanthera kamolensis.	Nehe	U.S.A. (HI)	Asteraceae	E	467	17.99(e)(1)	NA
*	*	*	*	*	*	*	
Melicope mucronulata	Alani	U.S.A. (HI)	Rutaceae	E	467	17.99(c), (e)(1)	NA
*	*	*	*	*	*	*	
Melicope munroi	Alani	U.S.A. (HI)	Rutaceae	E	666	17.99(c), (m)	NA
*	*	*	*	*	*	*	
Mucuna sloanei var. *persericea*.	Sea bean	U.S.A. (HI)	Fabaceae	E		17.99(e)(1)	NA
*	*	*	*	*	*	*	
Myrsine vaccinioides	Kolea	U.S.A. (HI)	Myrsinaceae	E		17.99(e)(1)	NA
*	*	*	*	*	*	*	
Neraudia sericea	None	U.S.A. (HI)	Urticaceae	E	559	17.99(c), (e)(1), (e)(2), (m)	NA
*	*	*	*	*	*	*	
Peperomia subpetiolata.	Alaala wai nui	U.S.A. (HI)	Piperaceae	E		17.99(e)(1)	NA
*	*	*	*	*	*	*	
Phyllostegia bracteata	None	U.S.A. (HI)	Lamiaceae	E		17.99(e)(1)	NA
*	*	*	*	*	*	*	
Phyllostegia haliakalae	None	U.S.A. (HI)	Lamiaceae	E		17.99(c), (e)(1), (m)	NA
*	*	*	*	*	*	*	
Phyllostegia hispida	None	U.S.A. (HI)	Lamiaceae	E	762	17.99(c)	NA
*	*	*	*	*	*	*	
Phyllostegia pilosa	None	U.S.A. (HI)	Lamiaceae	E		17.99(c), (e)(1)	NA
*	*	*	*	*	*	*	
Pittosporum halophilum.	Hoawa	U.S.A. (HI)	Pittosporaceae	E		17.99(c)	NA
*	*	*	*	*	*	*	
Platanthera holochila	None	U.S.A. (HI)	Orchidaceae	E	592	17.99(a)(1), (c), (e)(1), (i)	NA
*	*	*	*	*	*	*	
Pleomele fernaldii	Hala pepe	U.S.A. (HI)	Asparagaceae	E		17.99(m)	NA
*	*	*	*	*	*	*	
Portulaca sclerocarpa	Poe	U.S.A. (HI)	Portulacaceae	E	532	17.99(k), (m)	NA

Species		Historic range	Family	Status	When listed	Critical habitat	Special rules
Scientific name	Common name						
*	*	*	*	*	*		*
Santalum haleakalae var. *lanaiense*.	Lanai sandalwood or iliahi.	U.S.A. (HI)	Santalaceae	E	215	17.99(c), (e)(1), (m)	NA
*	*	*	*	*	*		*
Schenkia sebaeoides	Awiwi	U.S.A. (HI)	Gentianaceae	E	448	17.99(a)(1), (c), (e)(1), (i), (m)	NA
*	*	*	*	*	*		*
Schiedea jacobii	None	U.S.A. (HI)	Caryophyllaceae	E		17.99(e)(1)	NA
*	*	*	*	*	*		*
Schiedea laui	None	U.S.A. (HI)	Caryophyllaceae	E		17.99(c)	NA
*	*	*	*	*	*		*
Schiedea salicaria	None	U.S.A. (HI)	Caryophyllaceae	E		17.99(e)(1)	NA
*	*	*	*	*	*		*
Sesbania tomentosa	Ohai	U.S.A. (HI)	Fabaceae	E	559	17.99(a)(1), (c), (e)(1), (e)(2), (g), (i), (k), (m)	NA
*	*	*	*	*	*		*
Silene lanceolata	None	U.S.A. (HI)	Caryophyllaceae	E	480	17.99(c), (i), (m)	NA
*	*	*	*	*	*		*
Solanum incompletum	Popolo ku mai	U.S.A. (HI)	Solanaceae	E	559	17.99(e)(1), (k), (m)	NA
*	*	*	*	*	*		*
Spermolepis hawaiiensis.	None	U.S.A. (HI)	Apiaceae	E	559	17.99(a)(1), (c), (e)(1), (i), (m)	NA
*	*	*	*	*	*		*
Stenogyne kauaulaensis.	None	U.S.A. (HI)	Lamiaceae	E		17.99(e)(1)	NA
*	*	*	*	*	*		*
Tetramolopium lepidotum ssp. *lepidotum*.	None	U.S.A. (HI)	Asteraceae	E	448	17.99(i), (m)	NA
*	*	*	*	*	*		*
Tetramolopium remyi	None	U.S.A. (HI)	Asteraceae	E	435	17.99(e)(1), (m)	NA
*	*	*	*	*	*		*
Vigna o-wahuensis	None	U.S.A. (HI)	Fabaceae	E	559	17.99(c), (e)(1), (e)(2), (i), (k), (m)	NA
*	*	*	*	*	*		*
Viola lanaiensis	None	U.S.A. (HI)	Violaceae	E	435	17.99(m)	NA
*	*	*	*	*	*		*
Wikstroemia villosa	Akia	U.S.A. (HI)	Thymelaeaceae	E		17.99(e)(1)	NA
*	*	*	*	*	*		*
Zanthoxylum hawaiiense.	Ae	U.S.A. (HI)	Rutaceae	E	532	17.99(a)(1), (c), (e)(1), (m)	NA
*	*	*	*	*	*		*
FERNS AND ALLIES.							

Species		Historic range	Family	Status	When listed	Critical habitat	Special rules
Scientific name	Common name						
*	*	*	*	*	*		*
Adenophorus periens	Pendant kihi fern	U.S.A. (HI)	Grammitidaceae	E	559	17.99(a)(1), (c), (e)(1), (i), (k), (m)	NA
*	*	*	*	*	*		*
Asplenium dielerectum	Asplenium-leaved diellia.	U.S.A. (HI)	Aspleniaceae	E	559	17.99(a)(1), (c), (e)(1), (i), (k), (m)	NA
*	*	*	*	*	*		*
Asplenium peruvianum var. *insulare.*	None	U.S.A. (HI)	Aspleniaceae	E	553	17.99(e)(1), (k)	NA
*	*	*	*	*	*		*
Ctenitis squamigera	Pauoa	U.S.A. (HI)	Aspleniaceae	E	553	17.99(a)(1), (c), (e)(1), (i), (m)	NA
*	*	*	*	*	*		*
Diplazium molokaiense.	None	U.S.A. (HI)	Aspleniaceae	E	553	17.99(a)(1), (c), (e)(1), (i), (m)	NA
*	*	*	*	*	*		*
Huperzia mannii	Wawaeiole	U.S.A. (HI)	Lycopodiaceae	E	467	17.99(e)(1)	NA
*	*	*	*	*	*		*
Marsilea villosa	Ihi ihi	U.S.A. (HI)	Marsileaceae	E	474	17.99 (c), (i)	NA
*	*	*	*	*	*		*

* * * * *

4. Amend § 17.95 as follows:

a. In paragraph (b), by adding entries for ''Crested Honeycreeper (Akohekohe) (*Palmeria dolei*)'' and ''Maui Parrotbill (Kiwikiu) (*Pseudonestor xanthophrys*)'' in the same alphabetical order as these species occur in the table at § 17.11(h); and

b. In paragraph (f), by adding entries for ''Lanai tree snail (*Partulina semicarinata*),'' ''Lanai tree snail (*Partulina variabilis*),'' and ''Newcomb's tree snail (*Newcombia cumingi*),'' to the end of the paragraph, to read as set forth below.

§ 17.95 Critical habitat—fish and wildlife.

* * * * *

(b) *Birds.*

* * * * *

Crested Honeycreeper (Akohekohe) (*Palmeria dolei*)

(1) Critical habitat units are depicted for Maui County, Hawaii, on the maps below.

(2) *Primary constituent elements.*

(i) In unit 1, the primary constituent elements of critical habitat for the Akohekohe are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Shallow soils, little to no herbaceous layer.

(D) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(E) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(F) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

(ii) In units 2, 3, 4, 5, 6, 7, 8, and 9, the primary constituent elements of critical habitat for the Akohekohe are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

(iii) In units 10, 11, 12, 13, 14, 15, 16, and 17, the primary constituent elements of critical habitat for the Akohekohe are:

(A) Elevation: Between 3,300 and 6,500 ft (1,000 and 2,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Well-developed soils, montane bogs.

(D) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(E) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(F) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

(iv) In units 18, 19, 20, 21, 22, and 23, the primary constituent elements of critical habitat for the Akohekohe are:

(A) Elevation: Between 3,500 and 6,500 ft (1,000 and 2,000 m).

(B) Annual precipitation: Between 50 and 75 in (130 and 190 cm).

(C) Substrate: Deep ash deposits, thin silty loams.

(D) Canopy: *Acacia, Ilex, Metrosideros, Myrsine, Nestegis, Nothocestrum, Pisonia, Pittosporum, Psychotria, Sophora, Zanthoxylum.*

(E) Subcanopy: *Alyxia, Charpentiera, Coprosma, Dodonaea, Kadua, Labordia, Leptecophylla, Phyllostegia, Vaccinium.*

(F) Understory: Ferns, *Carex, Peperomia.*

(v) In units 24 and 25, the primary constituent elements of critical habitat for the Akohekohe are:

(A) Elevation: Between 6,500 and 9,800 ft (2,000 and 3,000 m).

(B) Annual precipitation: Between 15 and 40 in (38 and 100 cm).

(C) Substrate: Dry ash; sandy loam; rocky, undeveloped soils; weathered lava.

(D) Canopy: *Chamaesyce, Chenopodium, Metrosideros, Myoporum, Santalum, Sophora.*

(E) Subcanopy: *Coprosma, Dodonaea, Dubautia, Geranium, Leptecophylla, Vaccinium, Wikstroemia.*

(F) Understory: Ferns, *Bidens, Carex, Deschampsia, Eragrostis, Gahnia, Luzula, Panicum, Pseudognaphalium, Sicyos, Tetramolopium.*

(vi) In units 26, 27, 28, and 29, the primary constituent elements of critical habitat for the Akohekohe are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Less than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, rocky talus.

(D) Canopy: None.

(E) Subcanopy: *Antidesma, Chamaesyce, Diospyros, Dodonaea.*

(F) Understory: *Bidens, Eragrostis, Melanthera, Schiedea.*

(vii) In units 30, 31, 32, 33, 34, 35, and 36, the primary constituent elements of critical habitat for the Akohekohe are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.

(D) Canopy: None.

(E) Subcanopy: *Broussaisia, Cheirodendron, Leptecophylla, Metrosideros.*

(F) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

(viii) In unit 37, the primary constituent elements of critical habitat for the Akohekohe are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Shallow soils, little to no herbaceous layer.

(D) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(E) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(F) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

(ix) In units 38 and 39, the primary constituent elements of critical habitat for the Akohekohe are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

(x) In units 40 and 41, the primary constituent elements of critical habitat for the Akohekohe are:

(A) Elevation: Between 3,300 and 6,500 ft (1,000 and 2,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Well-developed soils, montane bogs.

(D) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(E) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(F) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

(xi) In unit 42, the primary constituent elements of critical habitat for the Akohekohe are:

(A) Elevation: Between 3,300 and 6,500 ft (1,000 and 2,000 m).

(B) Annual precipitation: Between 50 and 75 in (130 and 190 cm).

(C) Substrate: Deep ash deposits, thin silty loams.

(D) Canopy: *Acacia, Ilex, Metrosideros, Myrsine, Nestegis, Nothocestrum, Pisonia, Pittosporum, Psychotria, Sophora, Zanthoxylum.*

(E) Subcanopy: *Alyxia, Charpentiera, Coprosma, Dodonaea, Kadua, Labordia, Leptecophylla, Phyllostegia, Vaccinium.*

(F) Understory: Ferns, *Carex, Peperomia.*

(xii) In units 43 and 44, the primary constituent elements of critical habitat for the Akohekohe are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.

(D) Canopy: None.

(E) Subcanopy: *Broussaisia, Cheirodendron, Leptecophylla, Metrosideros.*

(F) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

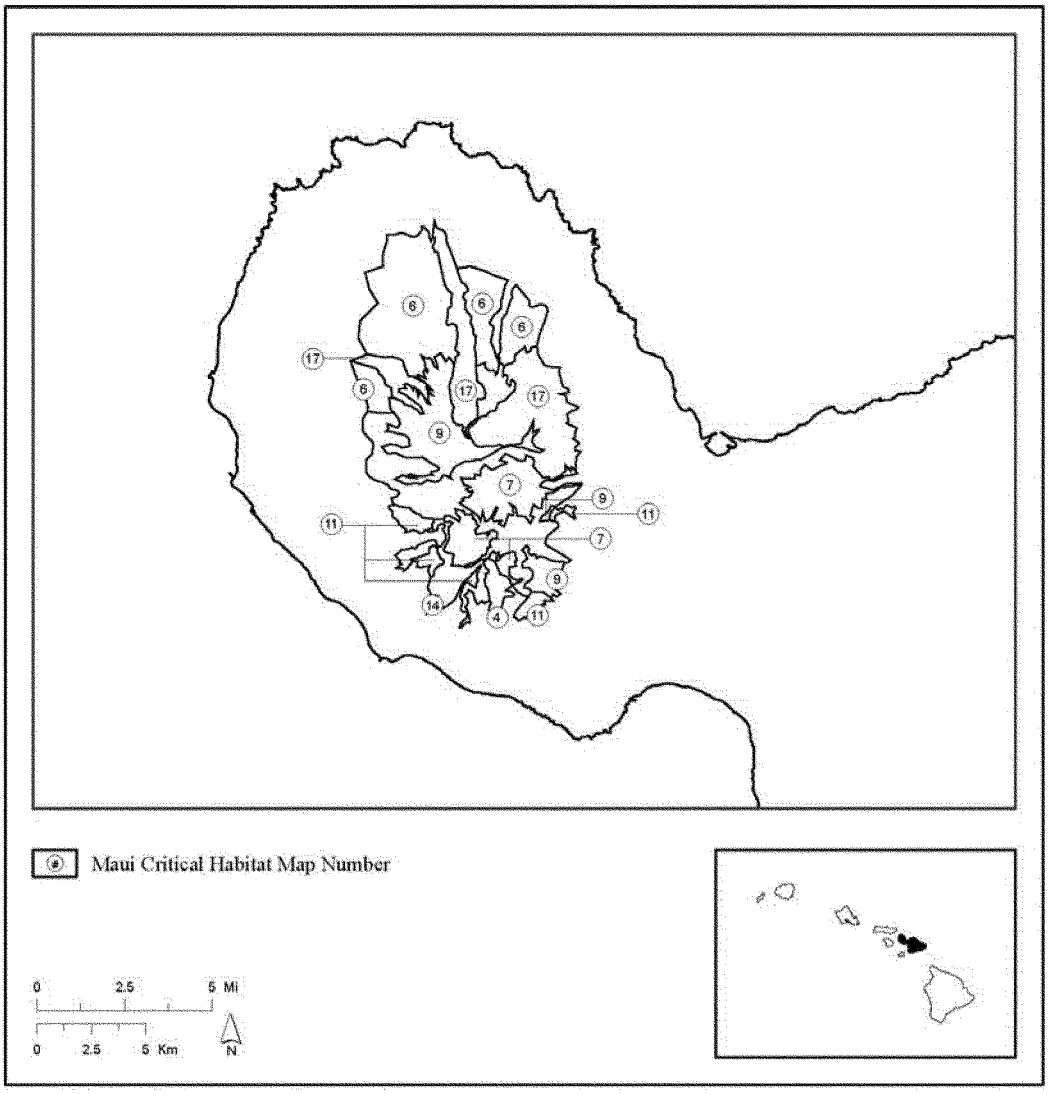
(3) Existing manmade features and structures, such as buildings, roads, railroads, airports, runways, other paved areas, lawns, and other urban landscaped areas, do not contain one or more of the physical or biological features. Federal actions limited to those areas, therefore, would not trigger a consultation under section 7 of the Act unless they may affect the species or physical or biological features in adjacent critical habitat.

(4) *Critical habitat maps.* Maps were created in GIS, with coordinates in UTM Zone 4, units in meters using North American datum of 1983 (NAD 83).

(5) Index maps of critical habitat units for the Akohekohe follow:

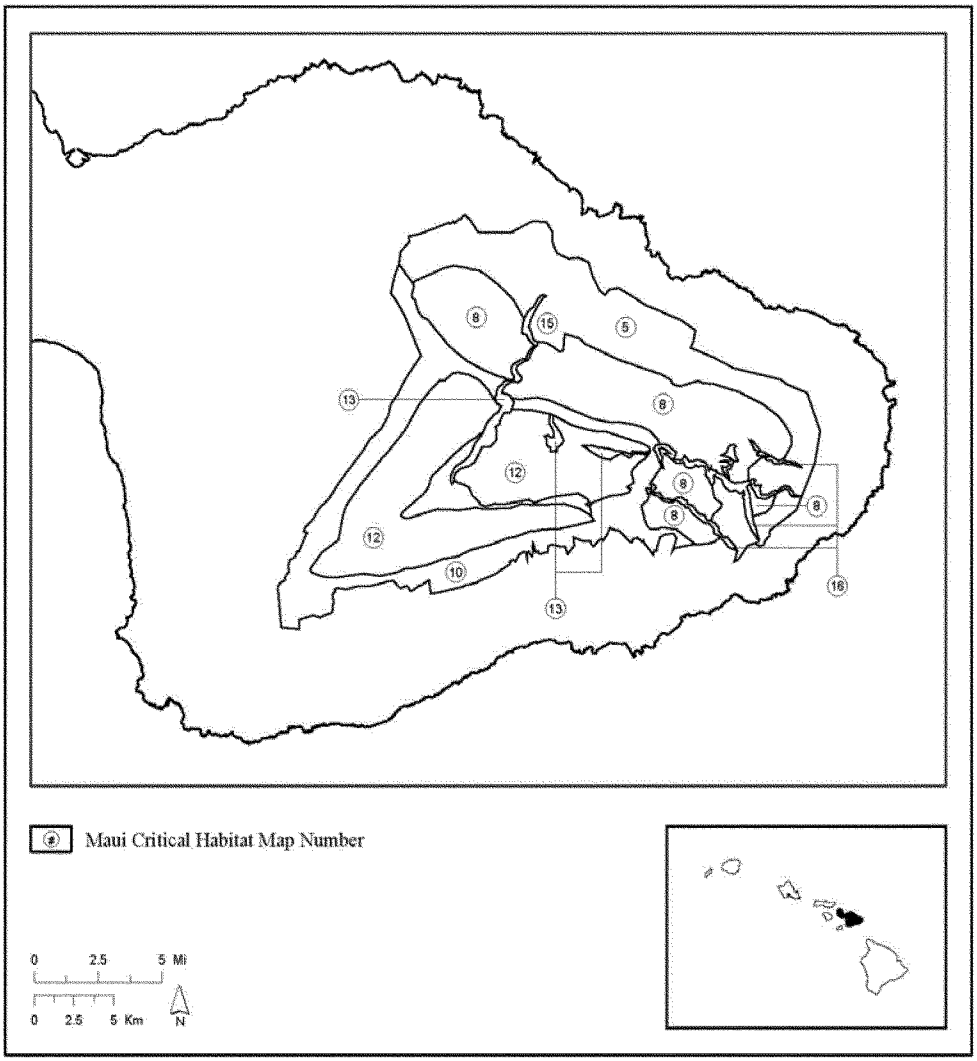
Map 1

Palmeria dolei—Index Map 1—West Maui



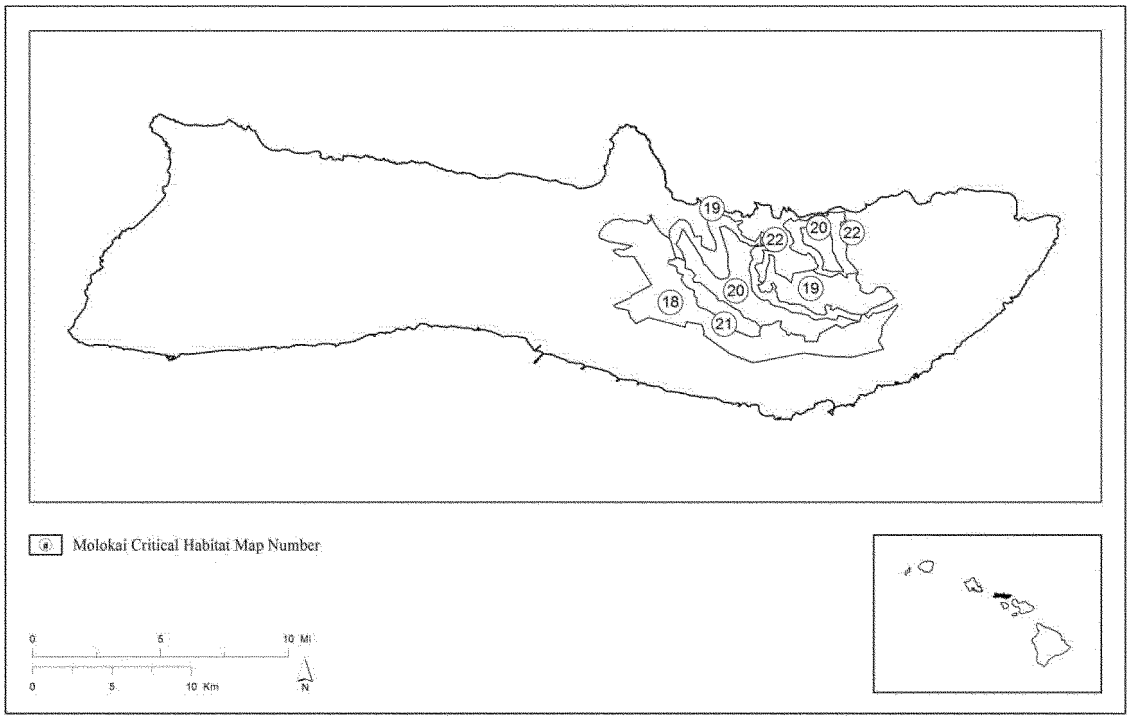
Map 2

Palmeria dolei—Index Map 2—East Maui



Map 3

Palmeria dolei—Index Map 3—Molokai



(6) *Palmeria dolei*—Lowland Mesic—Unit 1, Maui County, Hawaii (477 ac; 193 ha).

(i) [Reserved for textual description of Unit 1.]. This unit is critical habitat for the Akohekohe, *Palmeria dolei*.

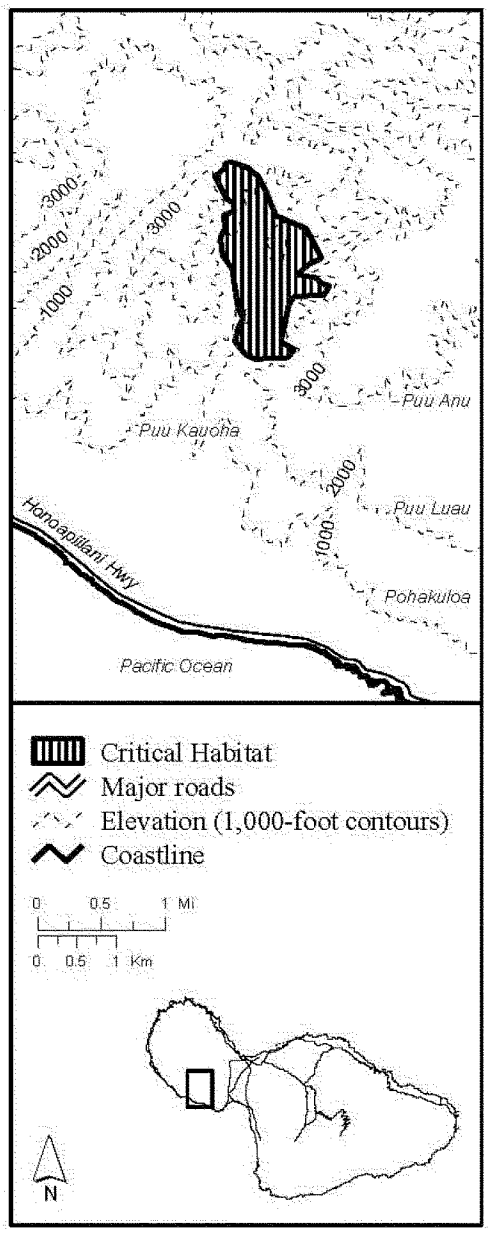
(ii) NOTE: Map of *Palmeria dolei*—Lowland Mesic—Unit 1 follows:

Map 4

Palmeria dolei

Lowland Mesic

Unit 1



(7) *Palmeria dolei*—Unit 2—Lowland Wet, Maui County, Hawaii (26,703 ac, 10,807 ha).

(i) [Reserved for textual description of Unit 2.] This unit is critical habitat for the Akohekohe, *Palmeria dolei.*

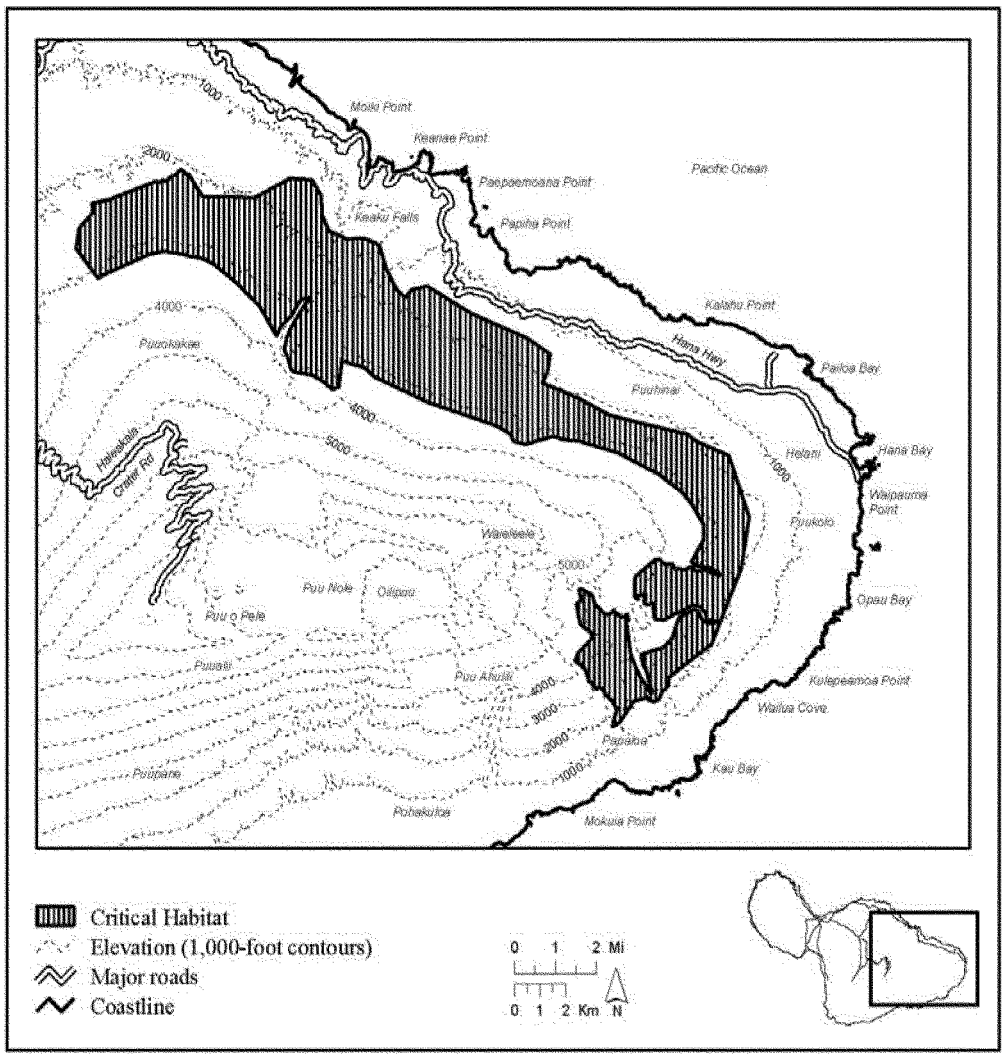
(ii) NOTE: Map of *Palmeria dolei*—Unit 2—Lowland Wet follows:

Map 5

Palmeria dolei

Lowland Wet

Unit 2



(8) *Palmeria dolei*—Unit 3—Lowland Wet, Maui County, Hawaii (5,066 ac, 2,050 ha); *Palmeria dolei*—Unit 4—Lowland Wet, Maui County, Hawaii (1,427 ac, 577 ha); *Palmeria dolei*—Unit 5—Lowland Wet, Maui County, Hawaii (1,165 ac, 472 ha); and *Palmeria dolei*—Unit 7—Lowland Wet, Maui County, Hawaii (639 ac, 259 ha).

(i) [Reserved for textual description of Unit 3.] This unit is critical habitat for the Akohekohe, *Palmeria dolei.*

(ii) [Reserved for textual description of Unit 4.] This unit is critical habitat for the Akohekohe, *Palmeria dolei.*

(iii) [Reserved for textual description of Unit 5.] This unit is critical habitat for the Akohekohe, *Palmeria dolei.*

(iv) [Reserved for textual description of Unit 7.] This unit is critical habitat for the Akohekohe, *Palmeria dolei.*

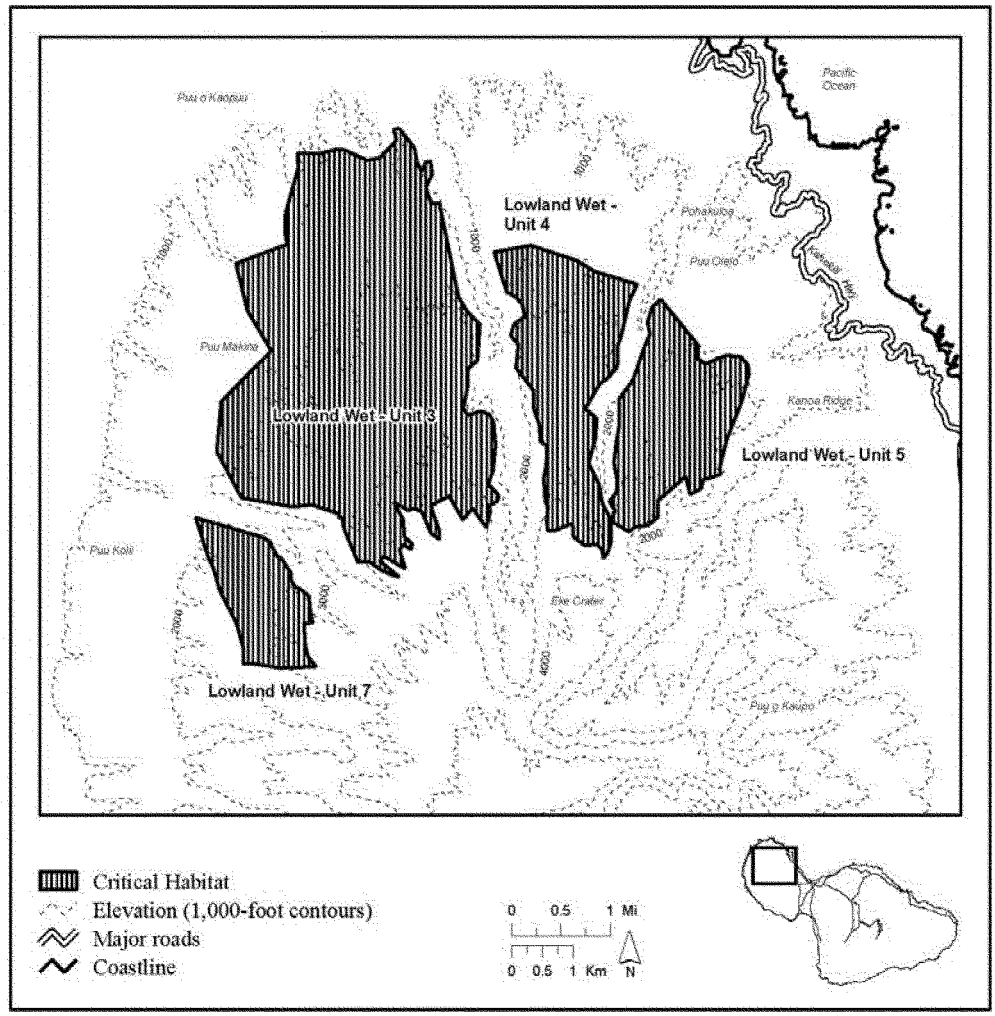
(v) NOTE: Map of *Palmeria dolei*—Unit 3—Lowland Wet, *Palmeria dolei*—Unit 4—Lowland Wet 4, *Palmeria dolei*—Unit 5—Lowland Wet, and *Palmeria dolei*—Unit 7—Lowland Wet follows:

Map 6

Palmeria dolei

Lowland Wet

Unit 3, Unit 4, Unit 5 and Unit 7



(9) *Palmeria dolei*—Unit 6—Lowland Wet, Maui County, Hawaii (2,112 ac, 855 ha); *Palmeria dolei*—Unit 8—Lowland Wet, Maui County, Hawaii (898 ac, 364 ha); and *Palmeria dolei*—Unit 9—Lowland Wet, Maui County, Hawaii (230 ac, 93 ha).

(i) [Reserved for textual description of Unit 6.] This unit is critical habitat for the Akohekohe, *Palmeria dolei.*

(ii) [Reserved for textual description of Unit 8.] This unit is critical habitat for the Akohekohe, *Palmeria dolei.*

(iii) [Reserved for textual description of Unit 9.] This unit is critical habitat for the Akohekohe, *Palmeria dolei.*

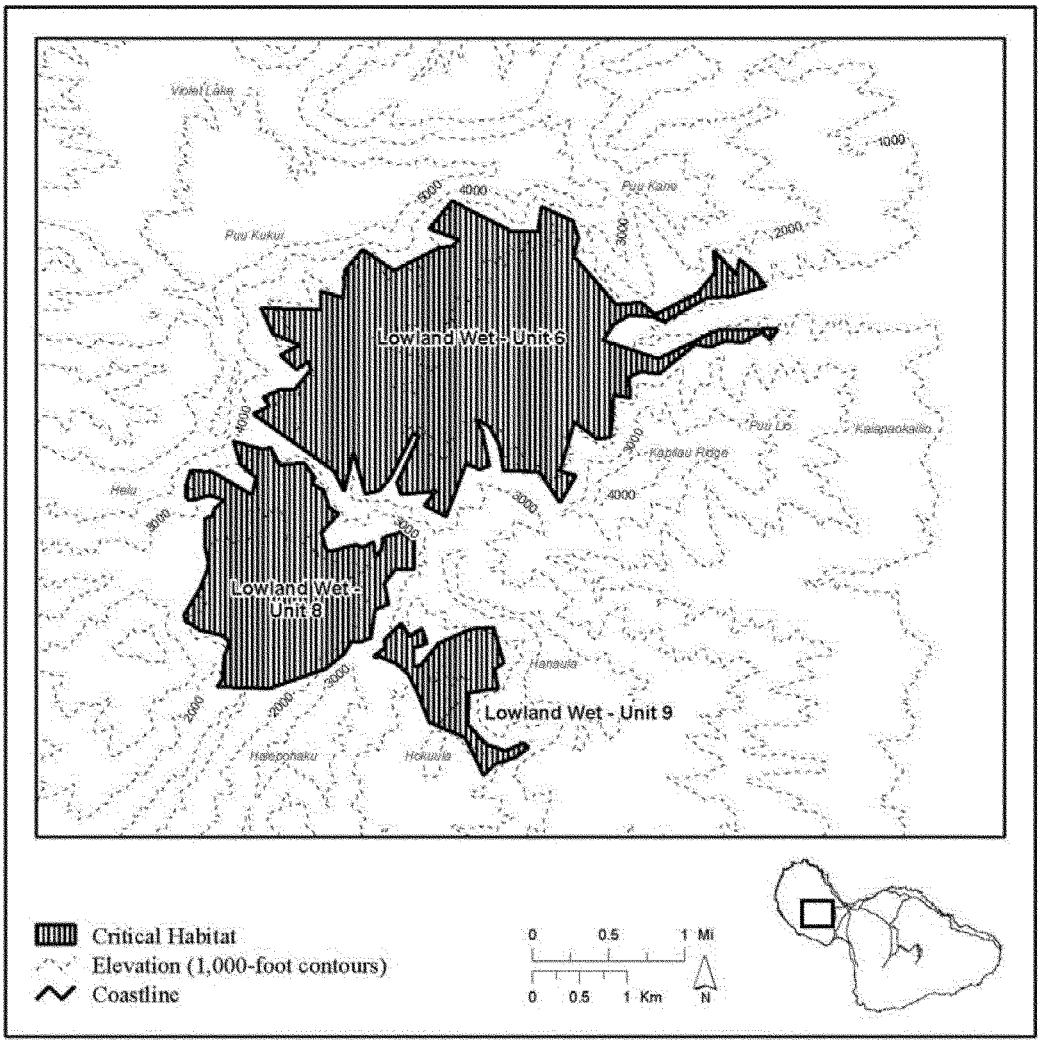
(iv) NOTE: Map of *Palmeria dolei*—Unit 6—Lowland Wet, *Palmeria dolei*—Unit 8—Lowland Wet, and *Palmeria dolei*—Unit 9—Lowland Wet follows:

Map 7

Palmeria dolei

Lowland Wet

Unit 6, Unit 8 and Unit 9



(10) *Palmeria dolei*—Unit 10—Montane Wet, Maui County, Hawaii (7,815 ac, 3,162 ha); *Palmeria dolei*—Unit 11—Montane Wet, Maui County, Hawaii (16,687 ac, 6,753 ha); *Palmeria dolei*—Unit 12—Montane Wet, Maui County, Hawaii (2,228 ac, 902 ha); *Palmeria dolei*—Unit 13—Montane Wet, Maui County, Hawaii (1,833 ac, 742 ha); and *Palmeria dolei*—Unit 14—Montane Wet, Maui County, Hawaii (387 ac, 156 ha).

(i) [Reserved for textual description of Unit 10.] This unit is critical habitat for the Akohekohe, *Palmeria dolei.*

(ii) [Reserved for textual description of Unit 11.] This unit is critical habitat for the Akohekohe, *Palmeria dolei.*

(iii) [Reserved for textual description of Unit 12.] This unit is critical habitat for the Akohekohe, *Palmeria dolei.*

(iv) [Reserved for textual description of Unit 13.] This unit is critical habitat for the Akohekohe, *Palmeria dolei.*

(v) [Reserved for textual description of Unit 14.] This unit is critical habitat for the Akohekohe, *Palmeria dolei.*

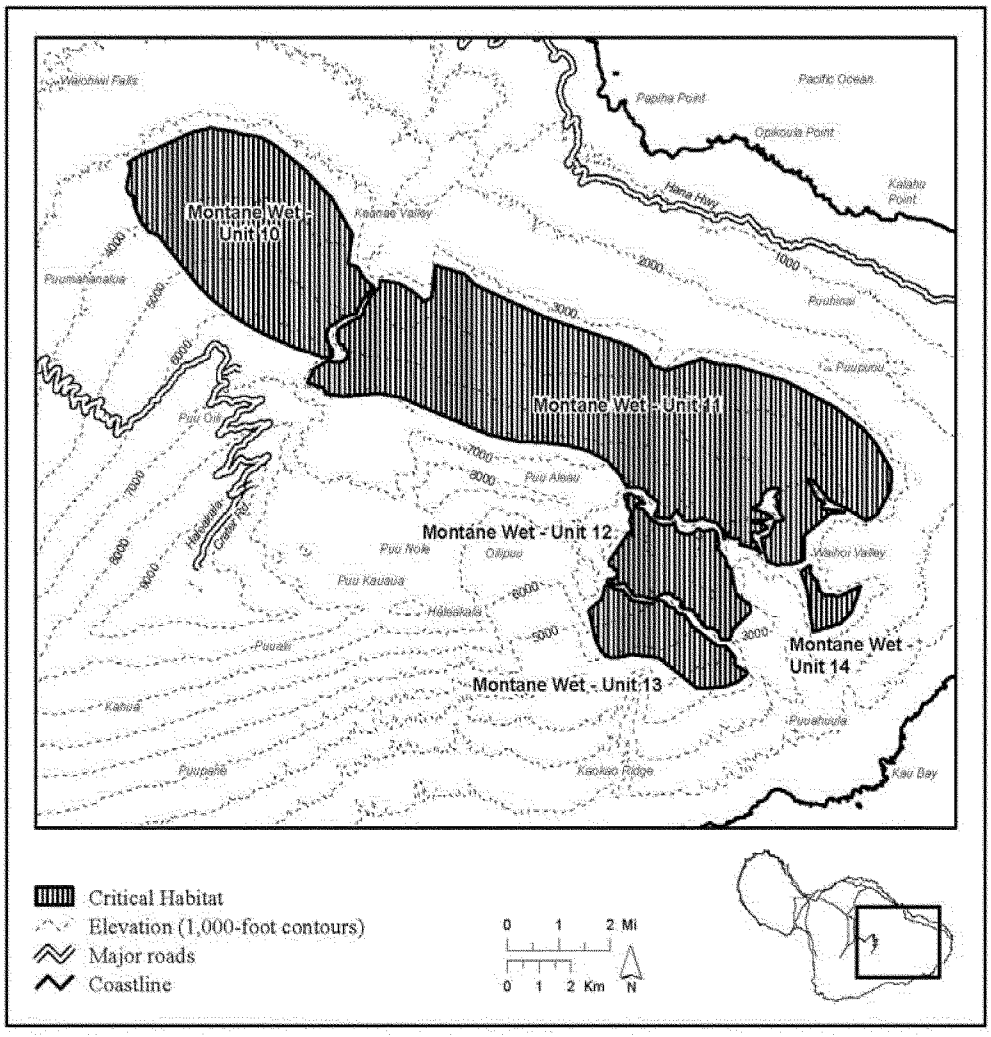
(vi) NOTE: Map of *Palmeria dolei*—Unit 10—Montane Wet, *Palmeria dolei*—Unit 11—Montane Wet, *Palmeria dolei*—Unit 12—Montane Wet, *Palmeria dolei*—Unit 13—Montane Wet, and *Palmeria dolei*—Unit 14—Montane Wet follows:

Map 8

Palmeria dolei

Montane Wet

Unit 10, Unit 11, Unit 12, Unit 13 and Unit 14



(11) *Palmeria dolei*—Unit 15—Montane Wet, Maui County, Hawaii (3,964 ac, 1,604 ha); *Palmeria dolei*—Unit 16—Montane Wet, Maui County, Hawaii (608 ac, 246 ha); and *Palmeria dolei*—Unit 17—Montane Wet, Maui County, Hawaii (46 ac, 19 ha).

(i) [Reserved for textual description of Unit 15.] This unit is critical habitat for the Akohekohe, *Palmeria dolei.*

(ii) [Reserved for textual description of Unit 16.] This unit is critical habitat for the Akohekohe, *Palmeria dolei.*

(iii) [Reserved for textual description of Unit 17.] This unit is critical habitat for the Akohekohe, *Palmeria dolei.*

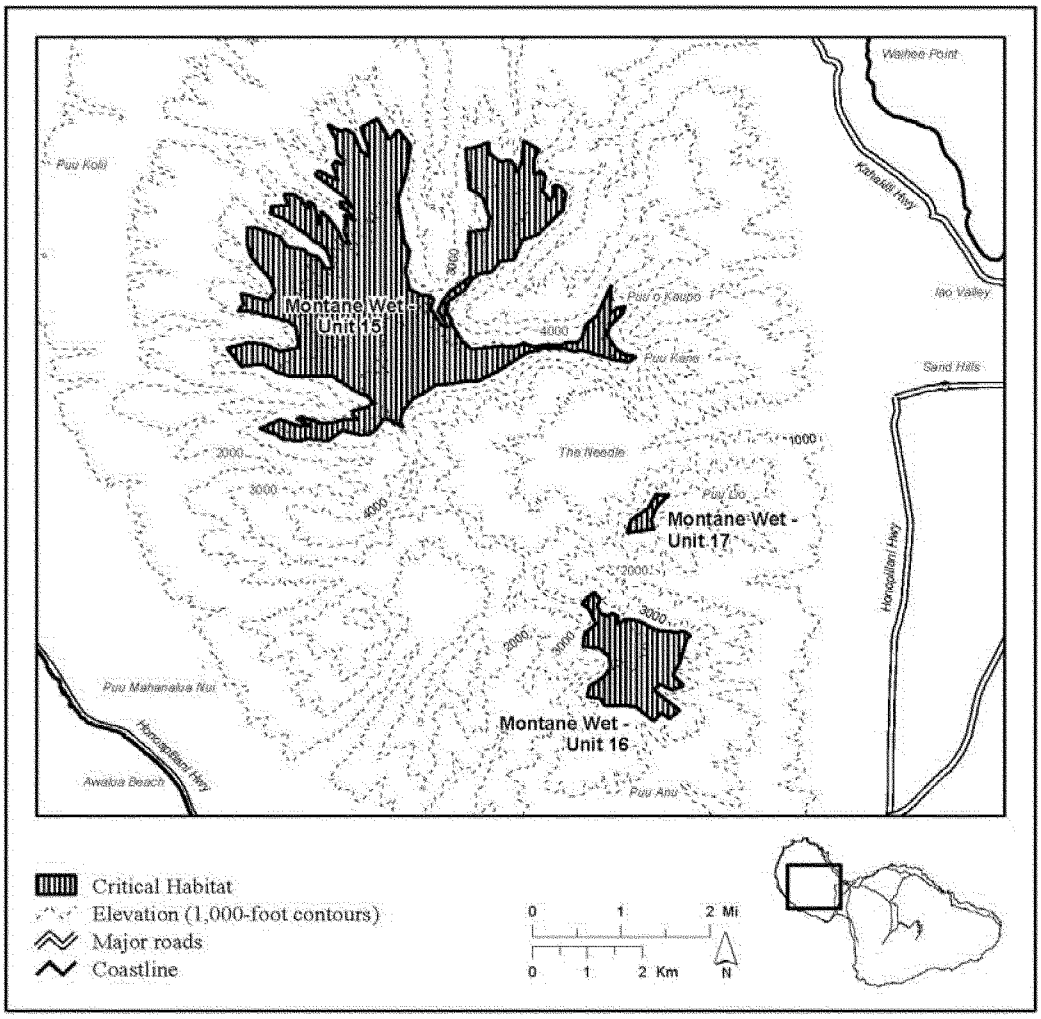
(iv) NOTE: Map of *Palmeria dolei*—Unit 15—Montane Wet, *Palmeria dolei*—Unit 16—Montane Wet, and *Palmeria dolei*—Unit 17—Montane Wet follows:

Map 9

Palmeria dolei

Montane Wet

Unit 15, Unit 16 and Unit 17



(12) *Palmeria dolei*—Unit 18—Montane Mesic, Maui County, Hawaii (20,972 ac, 8,487 ha).

(i) [Reserved for textual description of Unit 18.] This unit is critical habitat for the Akohekohe, *Palmeria dolei*.

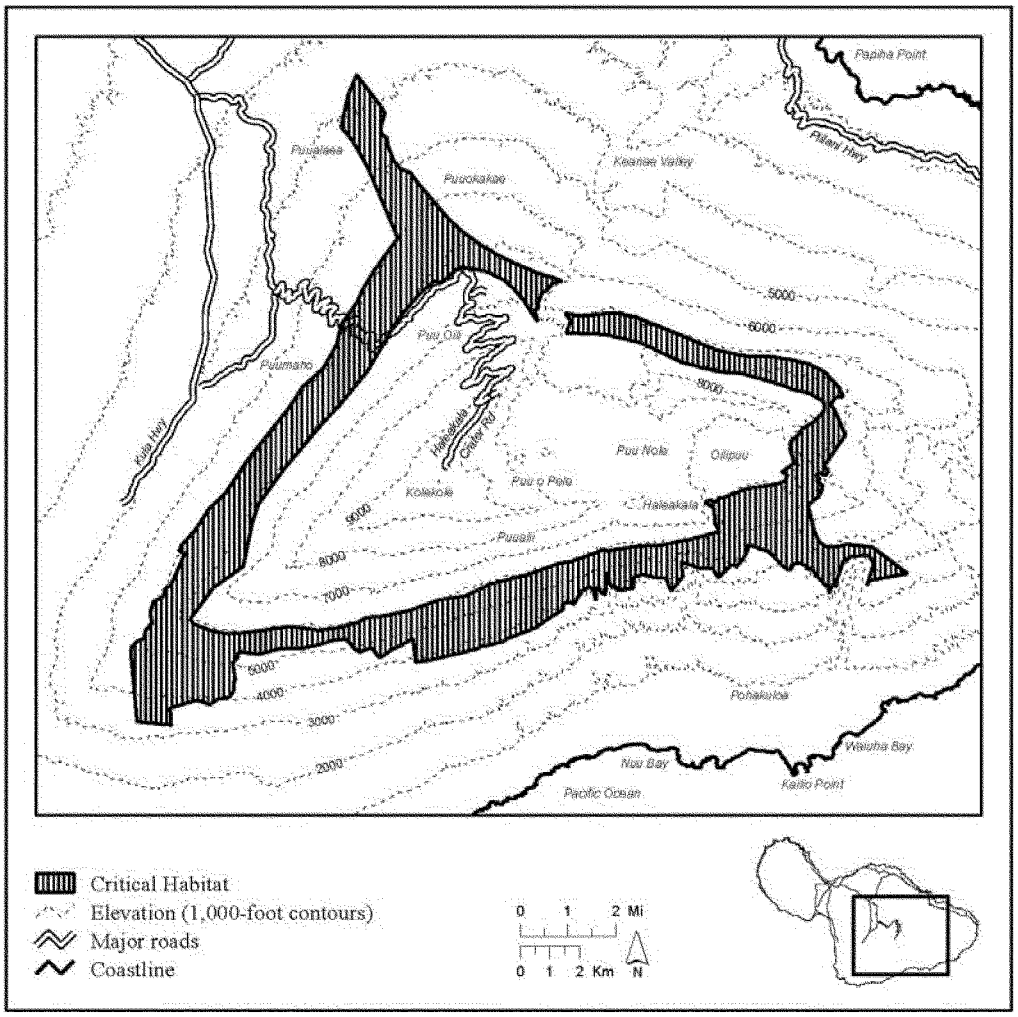
(ii) NOTE: Map of *Palmeria dolei*—Unit 18—Montane Mesic follows:

Map 10

Palmeria dolei

Montane Mesic

Unit 18



(13) *Palmeria dolei*—Unit 19—Montane Mesic, Maui County, Hawaii (366 ac, 148 ha); *Palmeria dolei*—Unit 20—Montane Mesic, Maui County, Hawaii (218 ac, 88 ha); *Palmeria dolei*—Unit 21—Montane Mesic, Maui County, Hawaii (72 ac, 29 ha); *Palmeria dolei*—Unit 22—Montane Mesic, Maui County, Hawaii (304 ac, 123 ha); and *Palmeria dolei*—Unit 23—Montane Mesic, Maui County, Hawaii (94 ac, 38 ha).

(i) [Reserved for textual description of Unit 19.] This unit is critical habitat for the Akohekohe, *Palmeria dolei.*

(ii) [Reserved for textual description of Unit 20.] This unit is critical habitat for the Akohekohe, *Palmeria dolei.*

(iii) [Reserved for textual description of Unit 21.] This unit is critical habitat for the Akohekohe, *Palmeria dolei.*

(iv) [Reserved for textual description of Unit 22.] This unit is critical habitat for the Akohekohe, *Palmeria dolei.*

(v) [Reserved for textual description of Unit 23.] This unit is critical habitat for the Akohekohe, *Palmeria dolei.*

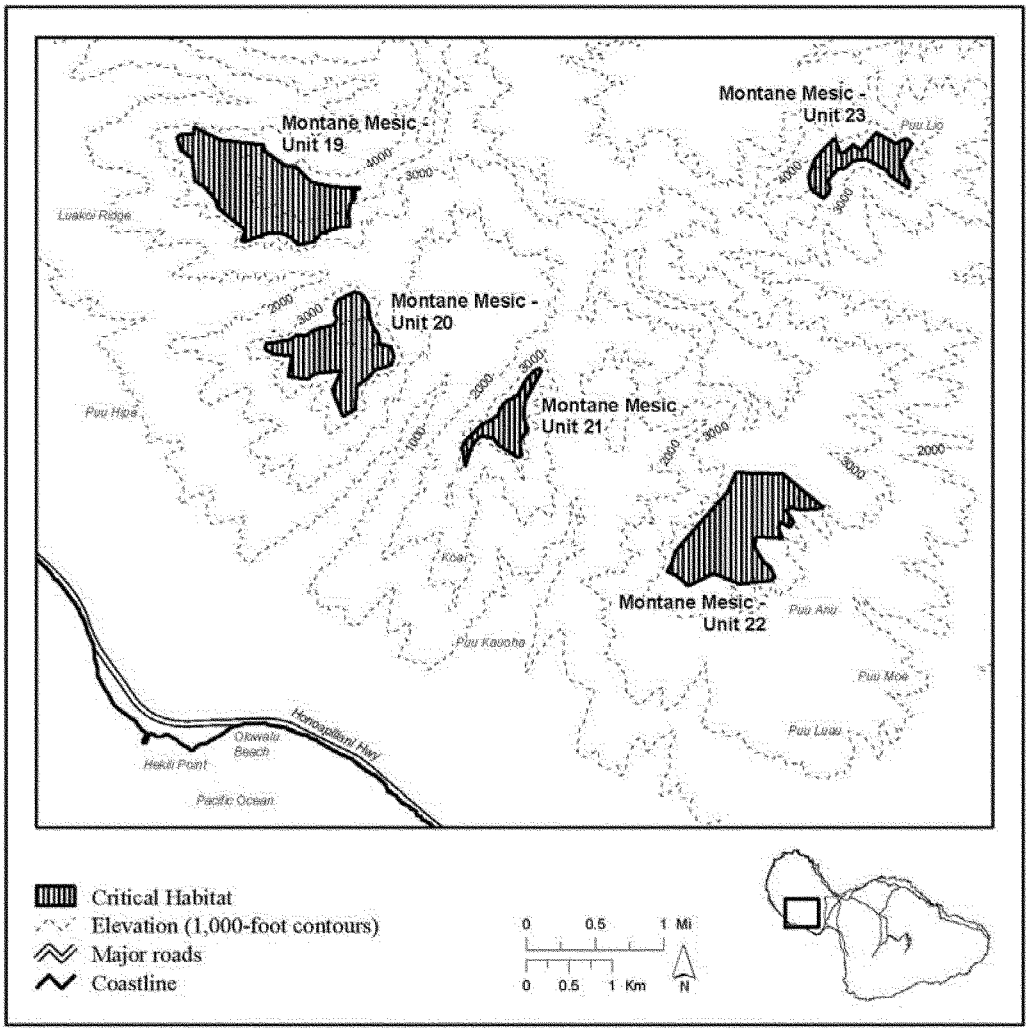
(vi) NOTE: Map of *Palmeria dolei*—Unit 19—Montane Mesic, *Palmeria dolei*—Unit 20—Montane Mesic, *Palmeria dolei*—Unit 21—Montane Mesic, *Palmeria dolei*—Unit 22—Montane Mesic, and *Palmeria dolei*—Unit 23—Montane Mesic follows:

Map 11

Palmeria dolei

Montane Mesic

Unit 19, Unit 20, Unit 21, Unit 22 and Unit 23



(14) *Palmeria dolei*—Unit 24—Subalpine, Maui County, Hawaii (19,401 ac, 7,851 ha), and *Palmeria dolei*—Unit 25—Subalpine, Maui County, Hawaii (10,931 ac, 4,424 ha).

(i) [Reserved for textual description of Unit 24.] This unit is critical habitat for the Akohekohe, *Palmeria dolei.*

(ii) [Reserved for textual description of Unit 25.] This unit is critical habitat for the Akohekohe, *Palmeria dolei.*

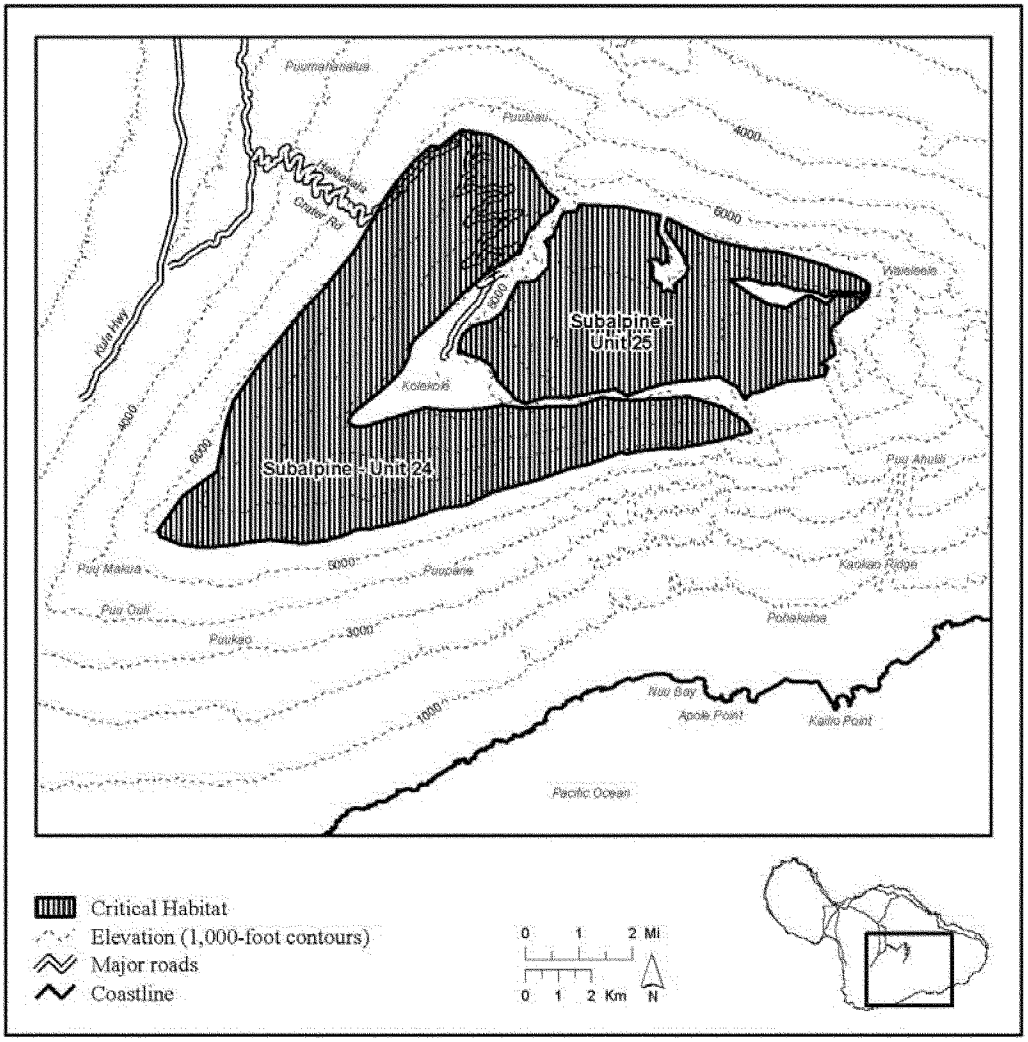
(iii) NOTE: Map of *Palmeria dolei*—Unit 24—Subalpine and *Palmeria dolei*—Unit 25—Subalpine follows:

Map 12

Palmeria dolei

Subalpine

Unit 24 and Unit 25



(15) *Palmeria dolei*—Unit 26—Dry Cliff, Maui County, Hawaii (1,018 ac, 412 ha); *Palmeria dolei*—Unit 27—Dry Cliff, Maui County, Hawaii (293 ac, 119 ha); and *Palmeria dolei*—Unit 28—Dry Cliff, Maui County, Hawaii (315 ac, 127 ha).

(i) [Reserved for textual description of Unit 26.] This unit is critical habitat for the Akohekohe, *Palmeria dolei.*

(ii) [Reserved for textual description of Unit 27.] This unit is critical habitat for the Akohekohe, *Palmeria dolei.*

(iii) [Reserved for textual description of Unit 28.] This unit is critical habitat for the Akohekohe, *Palmeria dolei.*

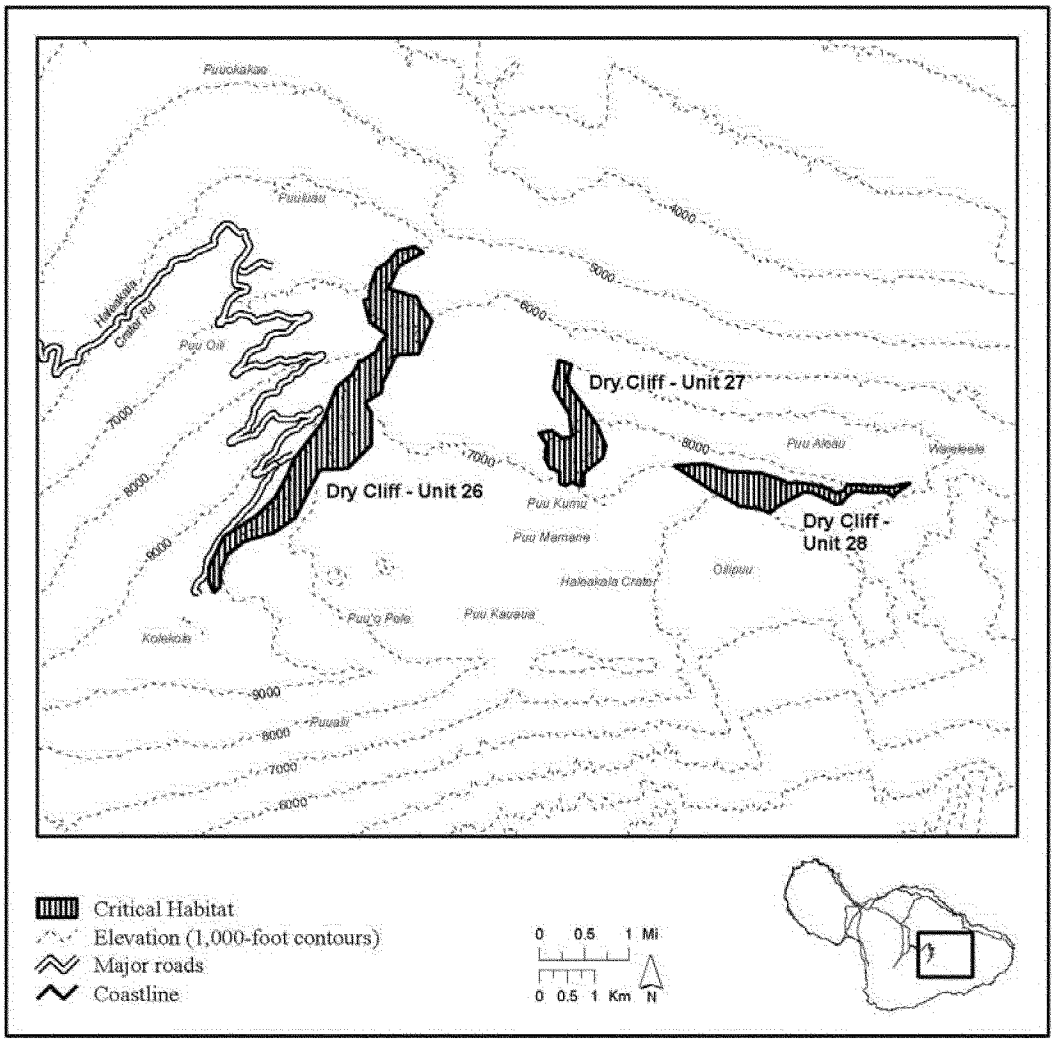
(iv) NOTE: Map of *Palmeria dolei*—Unit 26—Dry Cliff, *Palmeria dolei*—Unit 27—Dry Cliff, and *Palmeria dolei*—Unit 28—Dry Cliff follows:

Map 13

Palmeria dolei

Dry Cliff

Unit 26, Unit 27 and Unit 28



(16) *Palmeria dolei*—Unit 29—Dry Cliff, Maui County, Hawaii (1,536 ac, 622 ha).

(i) [Reserved for textual description of Unit 29.] This unit is critical habitat for the Akohekohe, *Palmeria dolei.*

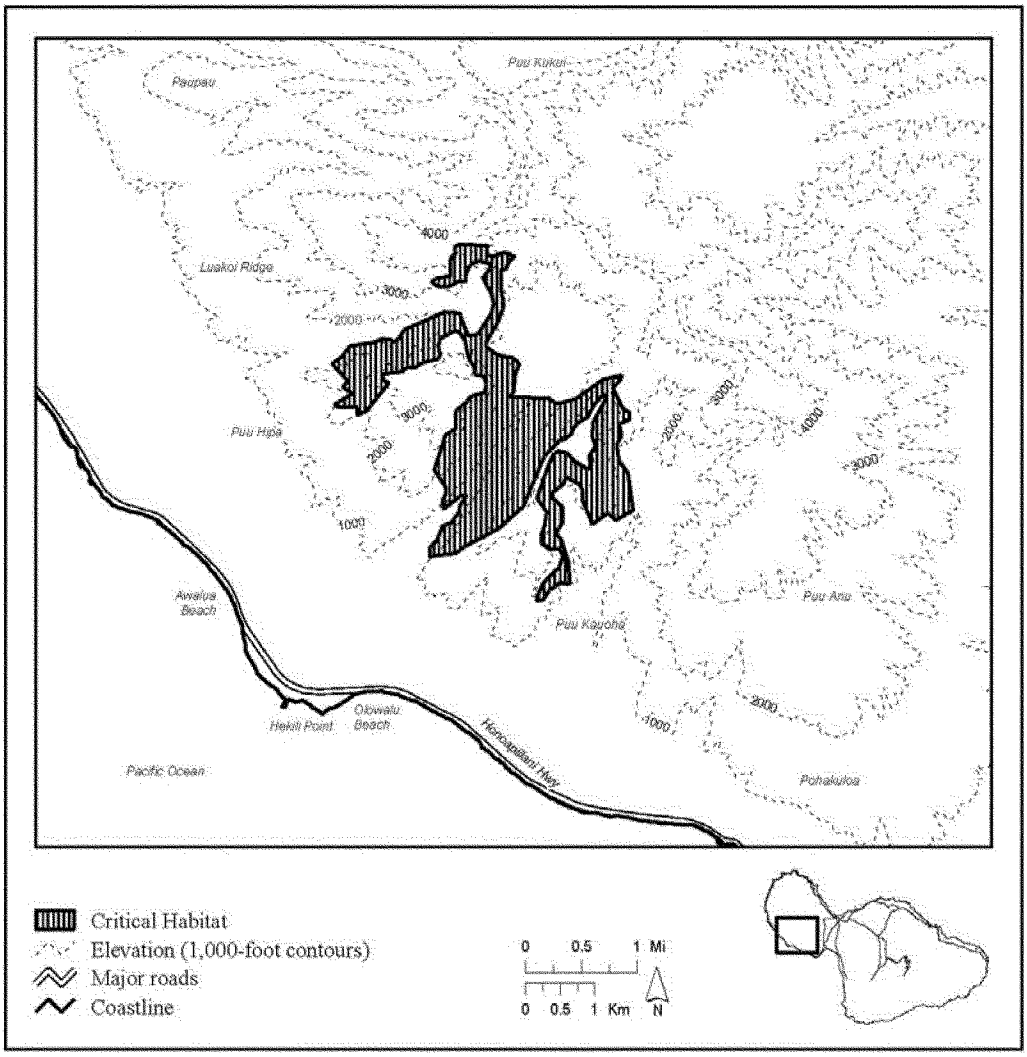
(ii) NOTE: Map of *Palmeria dolei*—Unit 29—Dry Cliff follows:

Map 14

Palmeria dolei

Dry Cliff

Unit 29



(17) *Palmeria dolei*—Unit 30—Wet Cliff, Maui County, Hawaii (460 ac, 186 ha).

(i) [Reserved for textual description of Unit 30.] This unit is critical habitat for the Akohekohe, *Palmeria dolei.*

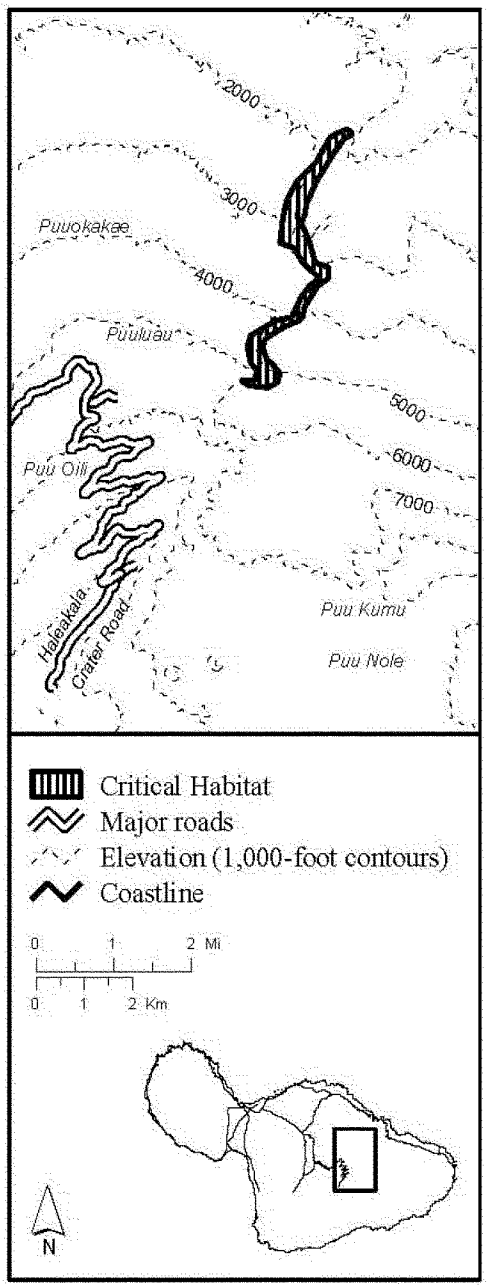
(ii) NOTE: Map of *Palmeria dolei*—Unit 30—Wet Cliff follows:

Map 15

Palmeria dolei

Wet Cliff

Unit 30



(18) *Palmeria dolei*—Unit 31—Wet Cliff, Maui County, Hawaii (1,407 ac, 569 ha); *Palmeria dolei*—Unit 32—Wet Cliff, Maui County, Hawaii (438 ac, 177 ha); and *Palmeria dolei*—Unit 33—Wet Cliff, Maui County, Hawaii (184 ac, 75 ha).

(i) [Reserved for textual description of Unit 31.] This unit is critical habitat for the Akohekohe, *Palmeria dolei.*

(ii) [Reserved for textual description of Unit 32.] This unit is critical habitat for the Akohekohe, *Palmeria dolei.*

(iii) [Reserved for textual description of Unit 33.] This unit is critical habitat for the Akohekohe, *Palmeria dolei.*

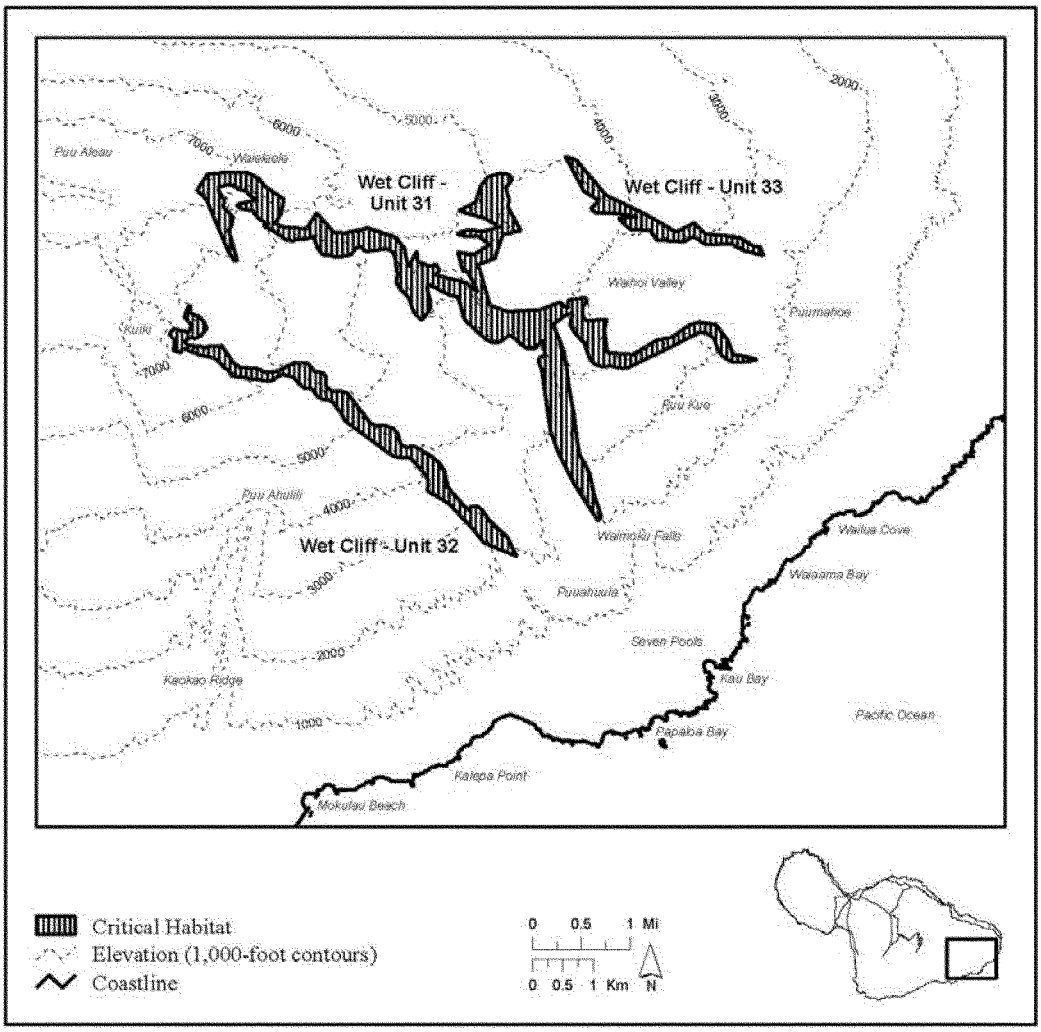
(iv) NOTE: Map of *Palmeria dolei*—Unit 31—Wet Cliff, *Palmeria dolei*—Unit 32—Wet Cliff, and *Palmeria dolei*—Unit 33—Wet Cliff follows:

Map 16

Palmeria dolei

Wet Cliff

Unit 31, Unit 32 and Unit 33



(19) *Palmeria dolei*—Unit 34—Wet Cliff, Maui County, Hawaii (2,048 ac, 829 ha); *Palmeria dolei*—Unit 35—Wet Cliff, Maui County, Hawaii (9,103 ac, 3,684 ha); and *Palmeria dolei*—Unit 36—Wet Cliff Maui County, Hawaii (781 ac, 316 ha).

(i) [Reserved for textual description of Unit 34.] This unit is critical habitat for the Akohekohe, *Palmeria dolei.*

(ii) [Reserved for textual description of Unit 35.] This unit is critical habitat for the Akohekohe, *Palmeria dolei.*

(iii) [Reserved for textual description of Unit 36.] This unit is critical habitat for the Akohekohe, *Palmeria dolei.*

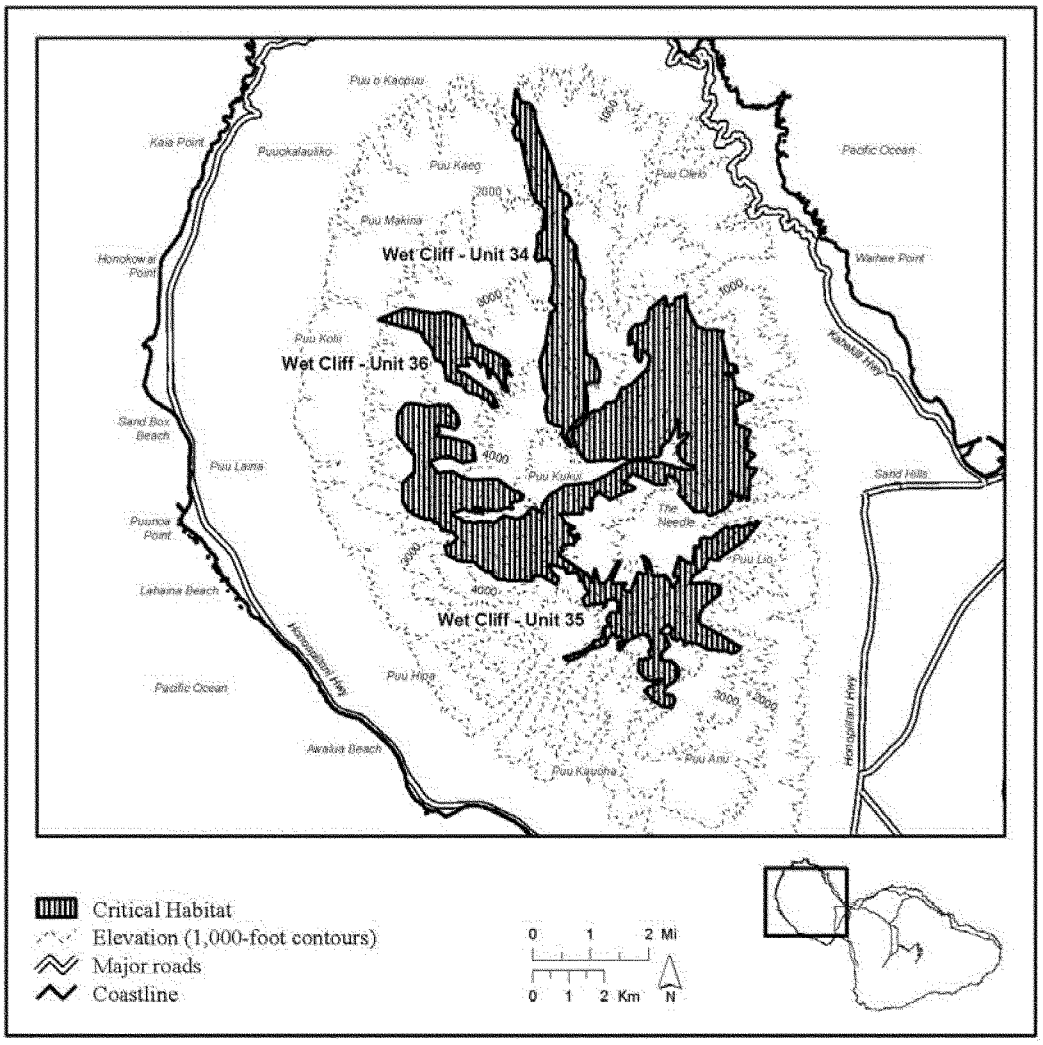
(iv) NOTE: Map of *Palmeria dolei*—Unit 34—Wet Cliff, *Palmeria dolei*—Unit 35—Wet Cliff, and *Palmeria dolei*—Unit 36—Wet Cliff follows:

Map 17

Palmeria dolei

Wet Cliff

Unit 34, Unit 35 and Unit 36



(20) *Palmeria dolei*—Unit 37—Lowland Mesic, Maui County, Hawaii (10,330 ac, 4,180 ha).

(i) [Reserved for textual description of Unit 37.] This unit is critical habitat for the Akohekohe, *Palmeria dolei.*

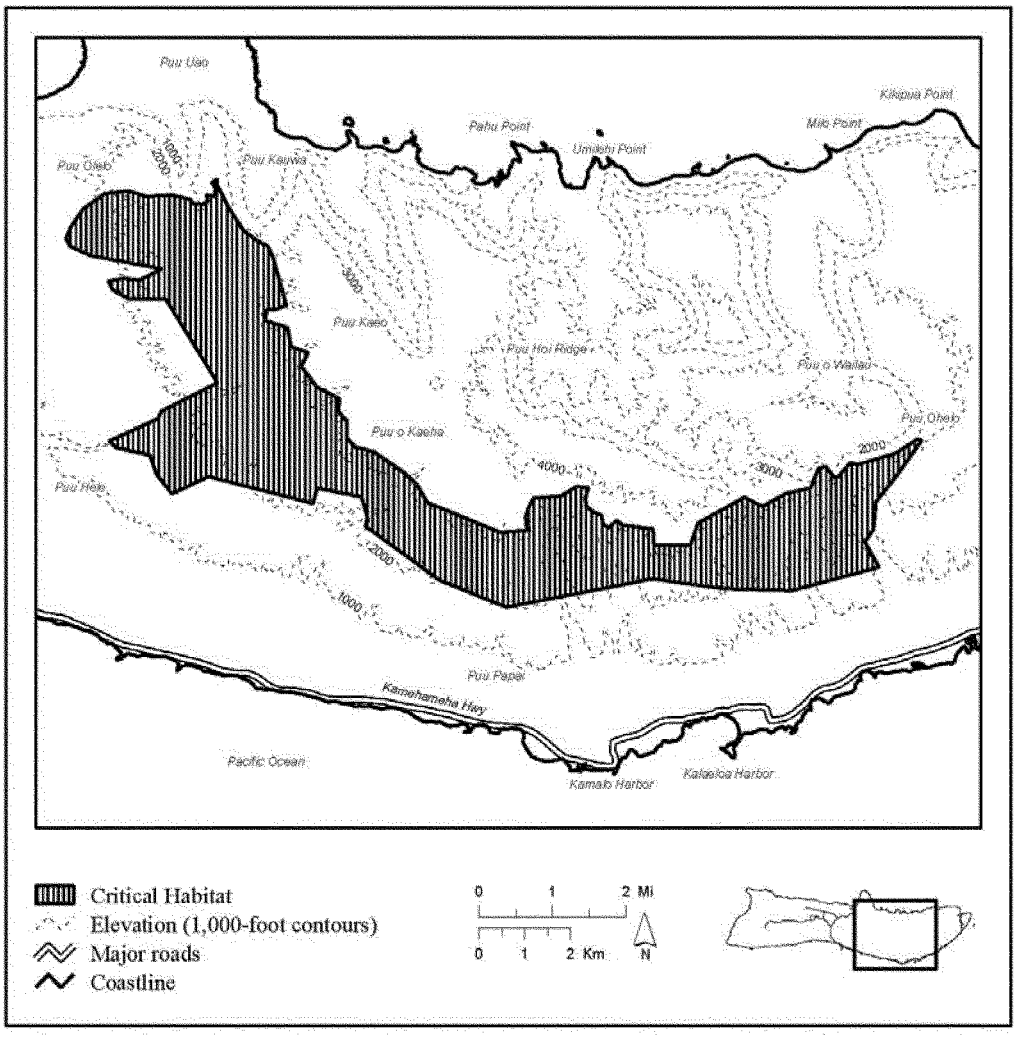
(ii) NOTE: Map of *Palmeria dolei*—Unit 37—Lowland Mesic follows:

Map 18

Palmeria dolei

Lowland Mesic

Unit 37



(21) *Palmeria dolei*—Unit 38—Lowland Wet, Maui County, Hawaii (3,628 ac, 1,468 ha), and *Palmeria dolei*—Unit 39—Lowland Wet, Maui County, Hawaii (1,952 ac, 790 ha).

(i) [Reserved for textual description of Unit 38.] This unit is critical habitat for the Akohekohe, *Palmeria dolei.*

(ii) [Reserved for textual description of Unit 39.] This unit is critical habitat for the Akohekohe, *Palmeria dolei.*

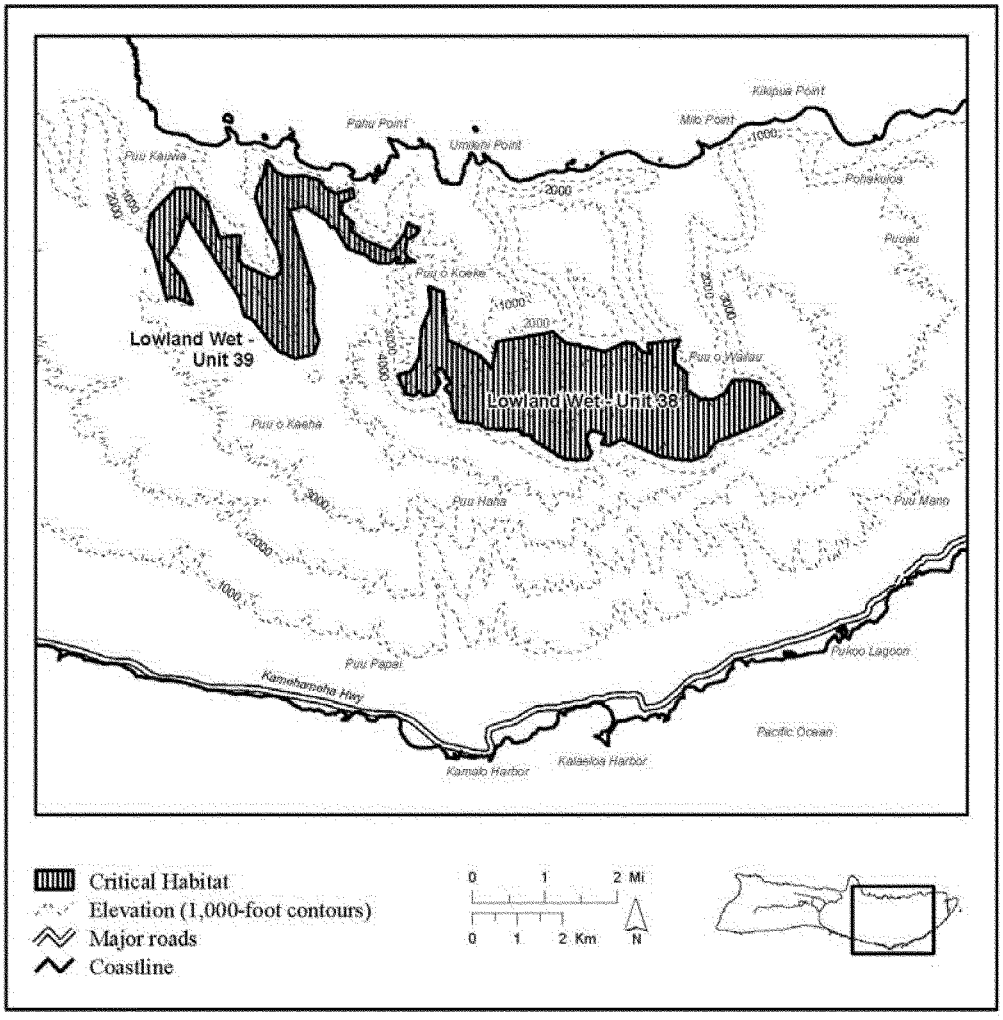
(iii) NOTE: Map of *Palmeria dolei*—Unit 38—Lowland Wet and *Palmeria dolei*—Unit 39—Lowland Wet follows:

Map 19

Palmeria dolei

Lowland Wet

Unit 38 and Unit 39



(22) *Palmeria dolei*—Unit 40—Montane Wet, Maui County, Hawaii (4,818 ac, 1,950 ha), and *Palmeria dolei*—Unit 41—Montane Wet, Maui County, Hawaii (910 ac, 368 ha).

(i) [Reserved for textual description of Unit 40.] This unit is critical habitat for the Akohekohe, *Palmeria dolei.*

(ii) [Reserved for textual description of Unit 41.] This unit is critical habitat for the Akohekohe, *Palmeria dolei.*

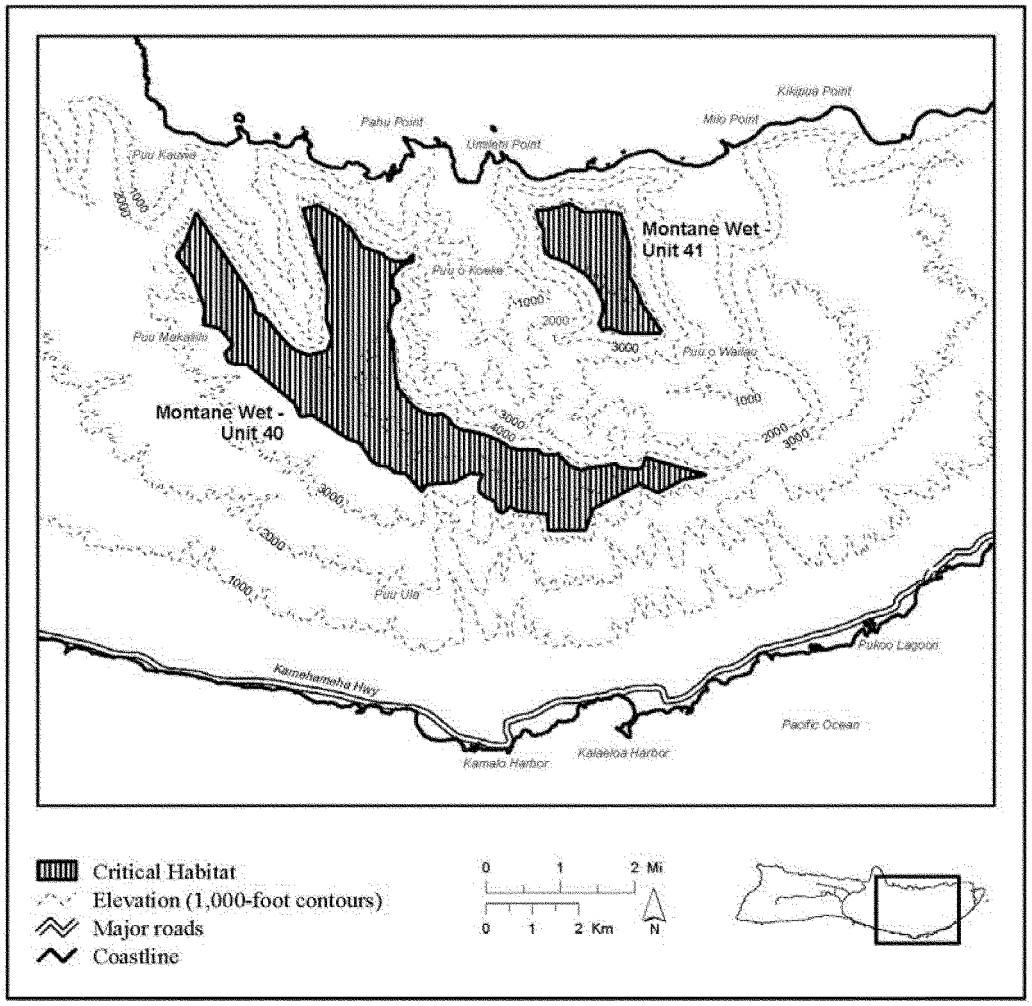
(iii) NOTE: Map of *Palmeria dolei*—Unit 40—Montane Wet and *Palmeria dolei*—Unit 41—Montane Wet follows:

Map 20

Palmeria dolei

Montane Wet

Unit 40 and Unit 41



(23) *Palmeria dolei*—Unit 42—Montane Mesic, Maui County, Hawaii (1,629 ac, 659 ha).

(i) [Reserved for textual description of Unit 42.] This unit is critical habitat for the Akohekohe, *Palmeria dolei.*

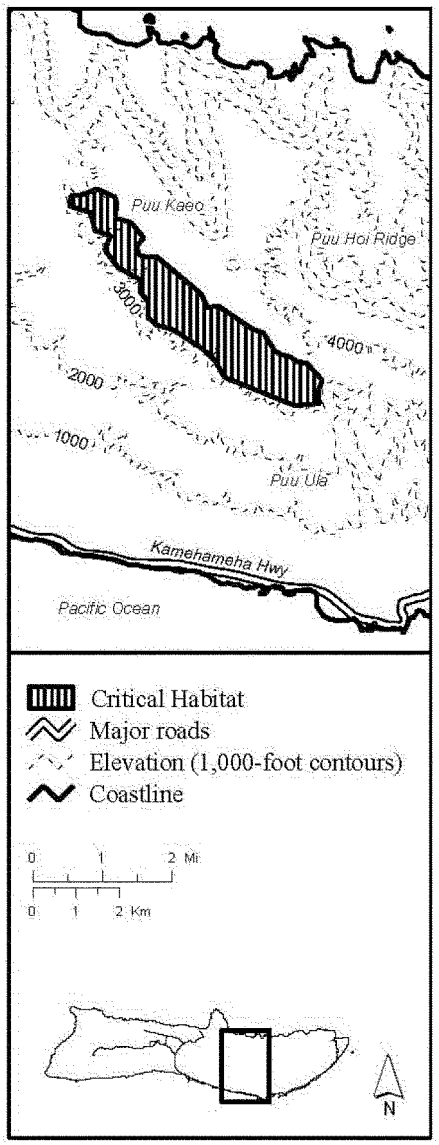
(ii) NOTE: Map of *Palmeria dolei*—Unit 42—Montane Mesic follows:

Map 21

Palmeria dolei

Montane Mesic

Unit 42



(24) *Palmeria dolei*—Unit 43—Wet Cliff, Maui County, Hawaii (1,888 ac, 764 ha), and *Palmeria dolei*—Unit 44—Wet Cliff, Maui County, Hawaii (1,280 ac, 518 ha).

(i) [Reserved for textual description of Unit 43.] This unit is critical habitat for the Akohekohe, *Palmeria dolei.*

(ii) [Reserved for textual description of Unit 44.] This unit is critical habitat for the Akohekohe, *Palmeria dolei.*

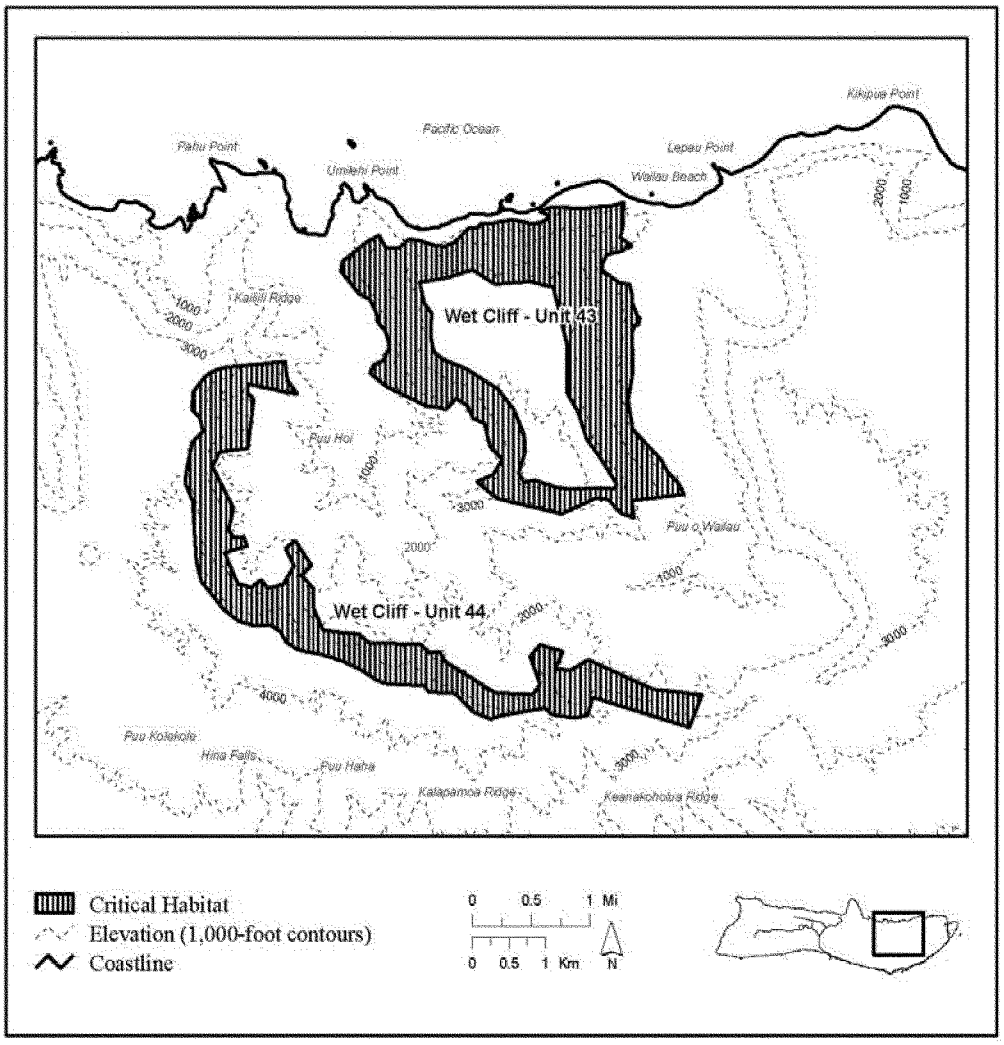
(iii) NOTE: Map of *Palmeria dolei*—Unit 43—Wet Cliff and *Palmeria dolei*—Unit 44—Wet Cliff follows:

Map 22

Palmeria dolei

Wet Cliff

Unit 43 and Unit 44



* * * * *

Maui Parrotbill (Kiwikiu) (*Pseudonestor xanthophrys*)

(1) Critical habitat units are depicted for Maui County, Hawaii, on the maps below.

(2) *Primary constituent elements.*

(i) In unit 1, the primary constituent elements of critical habitat for the Kiwikiu are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Shallow soils, little to no herbaceous layer.

(D) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(E) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(F) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

(ii) In units 2, 3, 4, 5, 6, 7, 8, and 9, the primary constituent elements of critical habitat for the Kiwikiu are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

(iii) In units 10, 11, 12, 13, 14, 15, 16, and 17, the primary constituent elements of critical habitat for the Kiwikiu are:

(A) Elevation: Between 3,300 and 6,500 ft (1,000 and 2,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Well-developed soils, montane bogs.

(D) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(E) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(F) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

(iv) In units 18, 19, 20, 21, 22, and 23, the primary constituent elements of critical habitat for the Kiwikiu are:

(A) Elevation: Between 3,300 and 6,500 ft (1,000 and 2,000 m).

(B) Annual precipitation: Between 50 and 75 in (130 and 190 cm).

(C) Substrate: Deep ash deposits, thin silty loams.

(D) Canopy: *Acacia, Ilex, Metrosideros, Myrsine, Nestegis, Nothocestrum, Pisonia, Pittosporum, Psychotria, Sophora, Zanthoxylum.*

(E) Subcanopy: *Alyxia, Charpentiera, Coprosma, Dodonaea, Kadua, Labordia, Leptecophylla, Phyllostegia, Vaccinium.*

(F) Understory: Ferns, *Carex, Peperomia.*

(v) In units 24 and 25, the primary constituent elements of critical habitat for the Kiwikiu are:

(A) Elevation: Between 6,500 and 9,800 ft (2,000 and 3,000 m).

(B) Annual precipitation: Between 15 and 40 in (38 and 100 cm).

(C) Substrate: Dry ash; sandy loam; rocky, undeveloped soils; weathered lava.

(D) Canopy: *Chamaesyce, Chenopodium, Metrosideros, Myoporum, Santalum, Sophora.*

(E) Subcanopy: *Coprosma, Dodonaea, Dubautia, Geranium, Leptecophylla, Vaccinium, Wikstroemia.*

(F) Understory: Ferns, *Bidens, Carex, Deschampsia, Eragrostis, Gahnia, Luzula, Panicum, Pseudognaphalium, Sicyos, Tetramolopium.*

(vi) In units 26, 27, 28, and 29, the primary constituent elements of critical habitat for the Kiwikiu are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Less than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, rocky talus.

(D) Canopy: None.

(E) Subcanopy: *Antidesma, Chamaesyce, Diospyros, Dodonaea.*

(F) Understory: *Bidens, Eragrostis, Melanthera, Schiedea.*

(vii) In units 30, 31, 32, 33, 34, 35, and 36, the primary constituent elements of critical habitat for the Kiwikiu are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.

(D) Canopy: None.

(E) Subcanopy: *Broussaisia, Cheirodendron, Leptecophylla, Metrosideros.*

(F) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

(viii) In unit 37, the primary constituent elements of critical habitat for the Kiwikiu are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Shallow soils, little to no herbaceous layer.

(D) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(E) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(F) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

(ix) In units 38 and 39, the primary constituent elements of critical habitat for the Kiwikiu are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

(x) In units 40 and 41, the primary constituent elements of critical habitat for the Kiwikiu are:

(A) Elevation: Between 3,300 and 6,500 ft (1,000 and 2,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Well-developed soils, montane bogs.

(D) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(E) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(F) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

(xi) In unit 42, the primary constituent elements of critical habitat for the Kiwikiu are:

(A) Elevation: Between 3,000 and 6,000 ft (p. 268 says 3,300 and 6,500) (1,000 and 2,000 m).

(B) Annual precipitation: Between 50 and 75 in (130 and 190 cm).

(C) Substrate: Deep ash deposits, thin silty loams.

(D) Canopy: *Acacia, Ilex, Metrosideros, Myrsine, Nestegis, Nothocestrum, Pisonia, Pittosporum, Psychotria, Sophora, Zanthoxylum.*

(E) Subcanopy: *Alyxia, Charpentiera, Coprosma, Dodonaea, Kadua, Labordia, Leptecophylla, Phyllostegia, Vaccinium.*

(F) Understory: Ferns, *Carex, Peperomia.*

(xii) In units 43 and 44, the primary constituent elements of critical habitat for the Kiwikiu are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.

(D) Canopy: None.

(E) Subcanopy: *Broussaisia, Cheirodendron, Leptecophylla, Metrosideros.*

(F) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

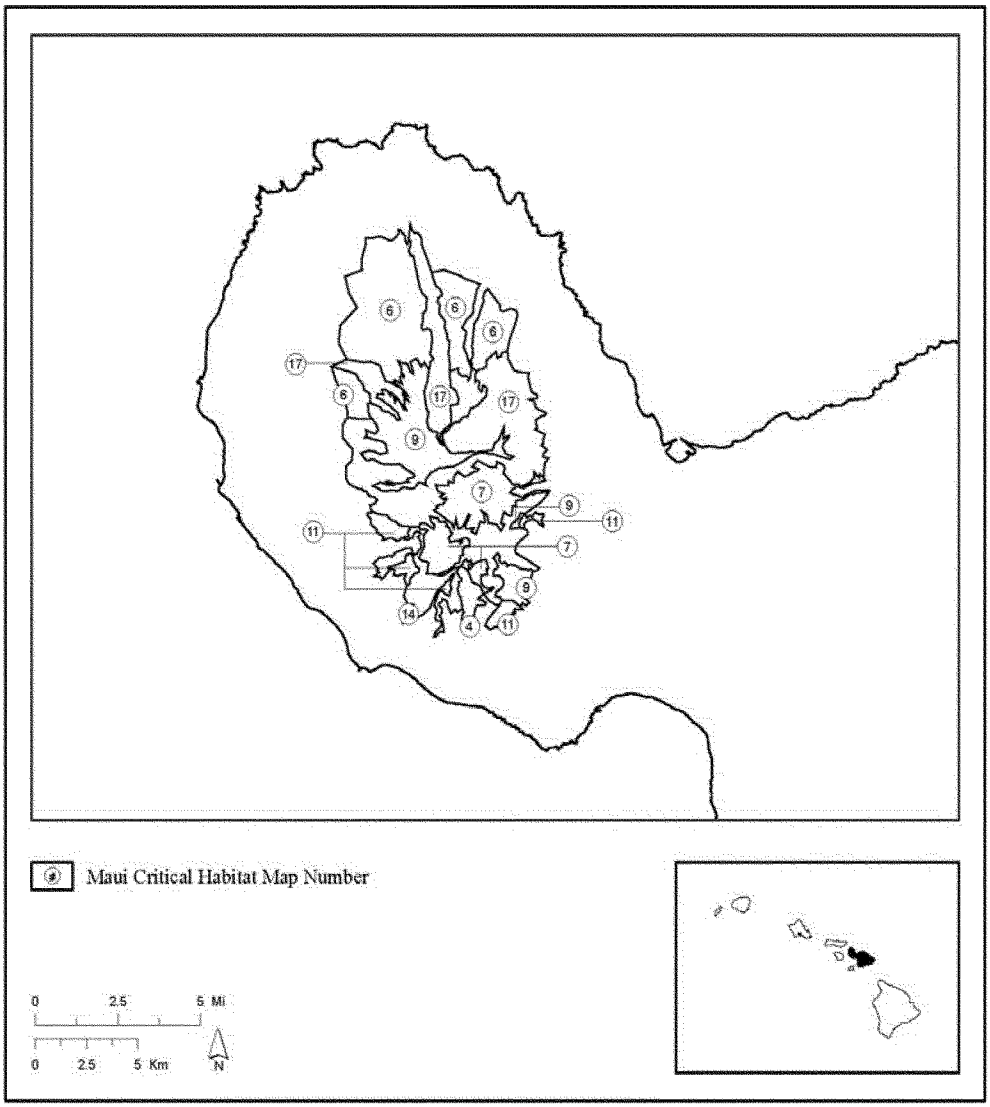
(3) Existing manmade features and structures, such as buildings, roads, railroads, airports, runways, other paved areas, lawns, and other urban landscaped areas, do not contain one or more of the physical or biological features. Federal actions limited to those areas, therefore, would not trigger a consultation under section 7 of the Act unless they may affect the species or physical or biological features in adjacent critical habitat.

(4) *Critical habitat maps.* Maps were created in GIS, with coordinates in UTM Zone 4, units in meters using North American datum of 1983 (NAD 83).

(5) Index maps of critical habitat units for the Kiwikiu follow:

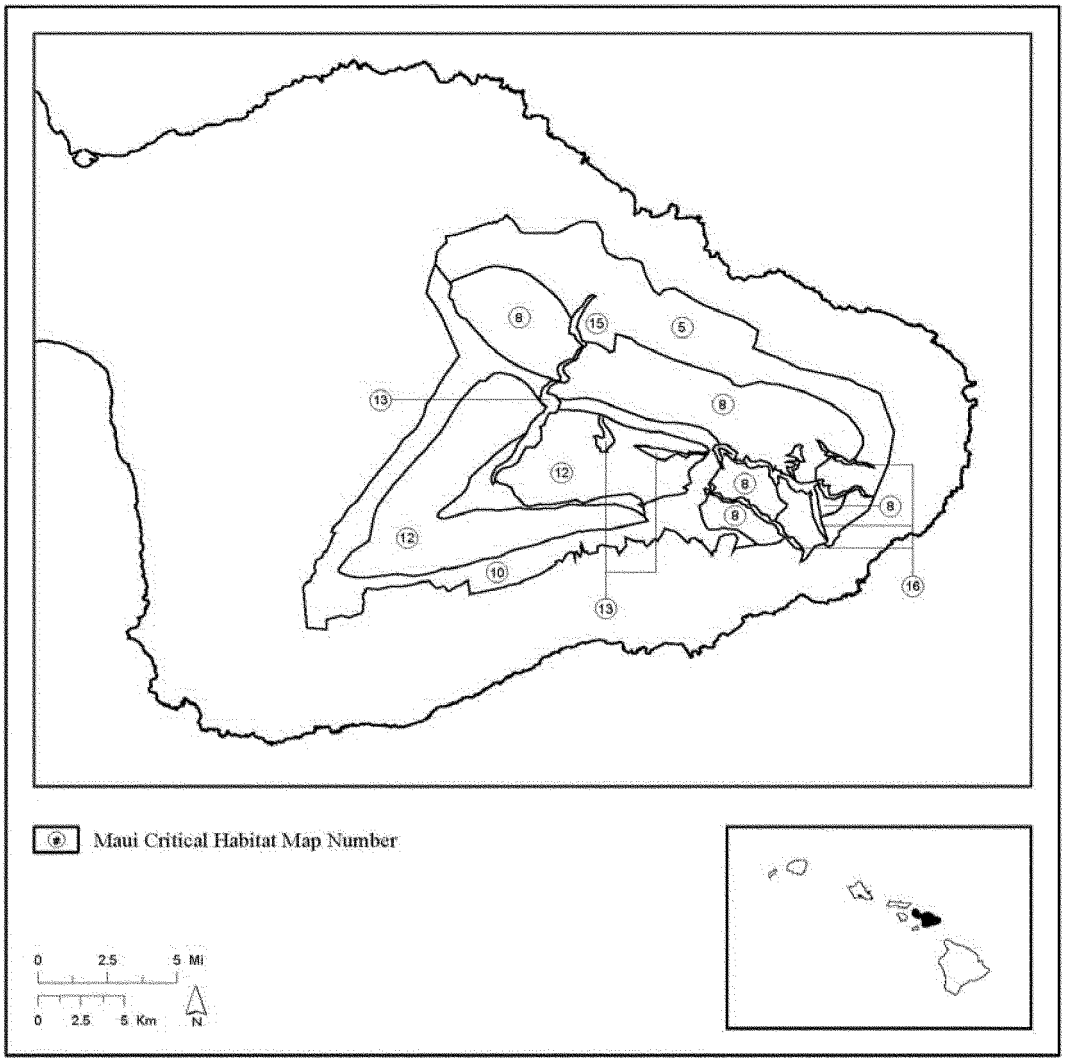
Map 1

***Pseudonestor xanthophrys*—Index Map 1—West Maui**



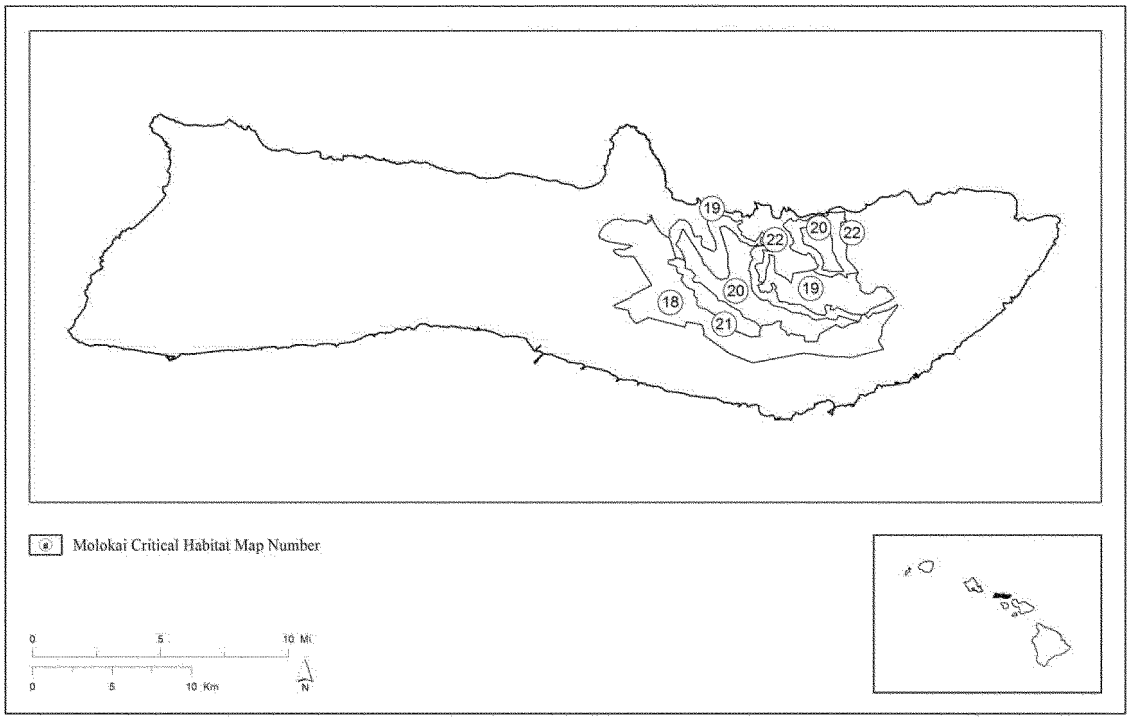
Map 2

Pseudonestor xanthophrys—Index Map 2—East Maui



Map 3

Pseudonestor xanthophrys—Index Map 3—Molokai



(6) *Pseudonestor xanthophrys*—Unit 1—Lowland Mesic, Maui County, Hawaii (477 ac; 193 ha).

(i) [Reserved for textual description of Unit 1.]. This unit is critical habitat for the Kiwikiu, *Pseudonestor xanthophrys.*

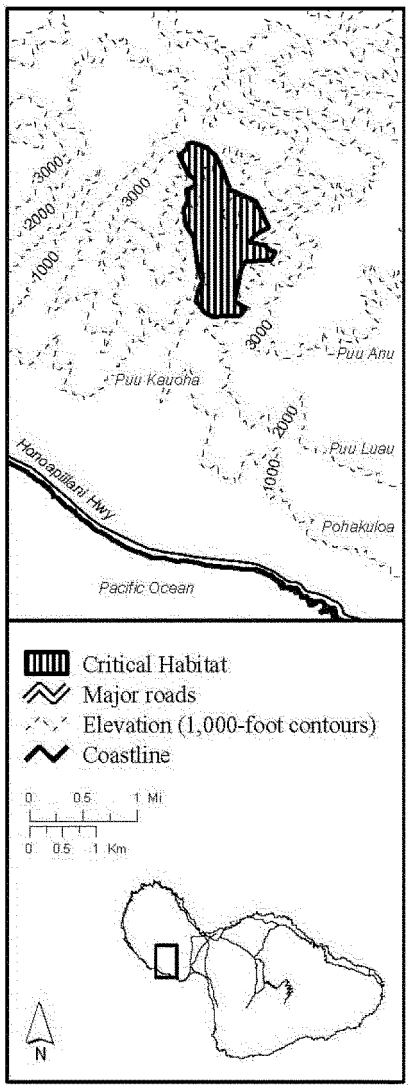
(ii) NOTE: Map of *Pseudonestor xanthophrys*—Unit 1—Lowland Mesic follows:

Map 4

Pseudonestor xanthophrys

Lowland Mesic

Unit 1



(7) *Pseudonestor xanthophrys*—Unit 2—Lowland Wet, Maui County, Hawaii (26,703 ac, 10,807 ha).

(i) [Reserved for textual description of Unit 2.] This unit is critical habitat for the Kiwikiu, *Pseudonestor xanthophrys.*

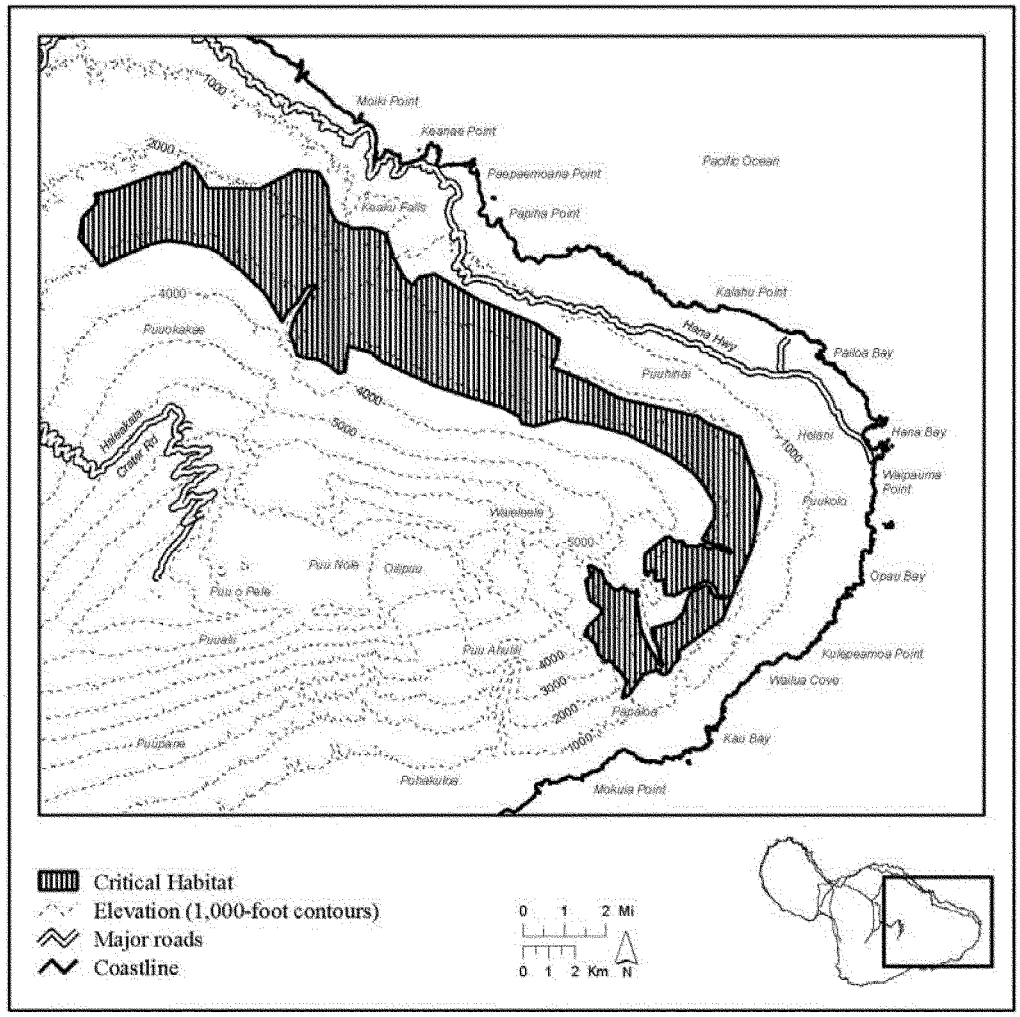
(ii) NOTE: Map of *Pseudonestor xanthophrys*—Unit 2—Lowland Wet follows:

Map 5

Pseudonestor xanthophrys

Lowland Wet

Unit 2



(8) *Pseudonestor xanthophrys*—Unit 3—Lowland Wet, Maui County, Hawaii (5,066 ac, 2,050 ha); *Pseudonestor xanthophrys*—Unit 4—Lowland Wet, Maui County, Hawaii (1,427 ac, 577 ha); *Pseudonestor xanthophrys*—Unit 5—Lowland Wet, Maui County, Hawaii (1,165 ac, 472 ha); and *Pseudonestor xanthophrys*—Unit 7—Lowland Wet, Maui County, Hawaii (639 ac, 259 ha).

(i) [Reserved for textual description of Unit 3.] This unit is critical habitat for the Kiwikiu, *Pseudonestor xanthophrys.*

(ii) [Reserved for textual description of Unit 4.] This unit is critical habitat for the Kiwikiu, *Pseudonestor xanthophrys.*

(iii) [Reserved for textual description of Unit 5.] This unit is critical habitat for the Kiwikiu, *Pseudonestor xanthophrys.*

(iv) [Reserved for textual description of Unit 7.] This unit is critical habitat for the Kiwikiu, *Pseudonestor xanthophrys.*

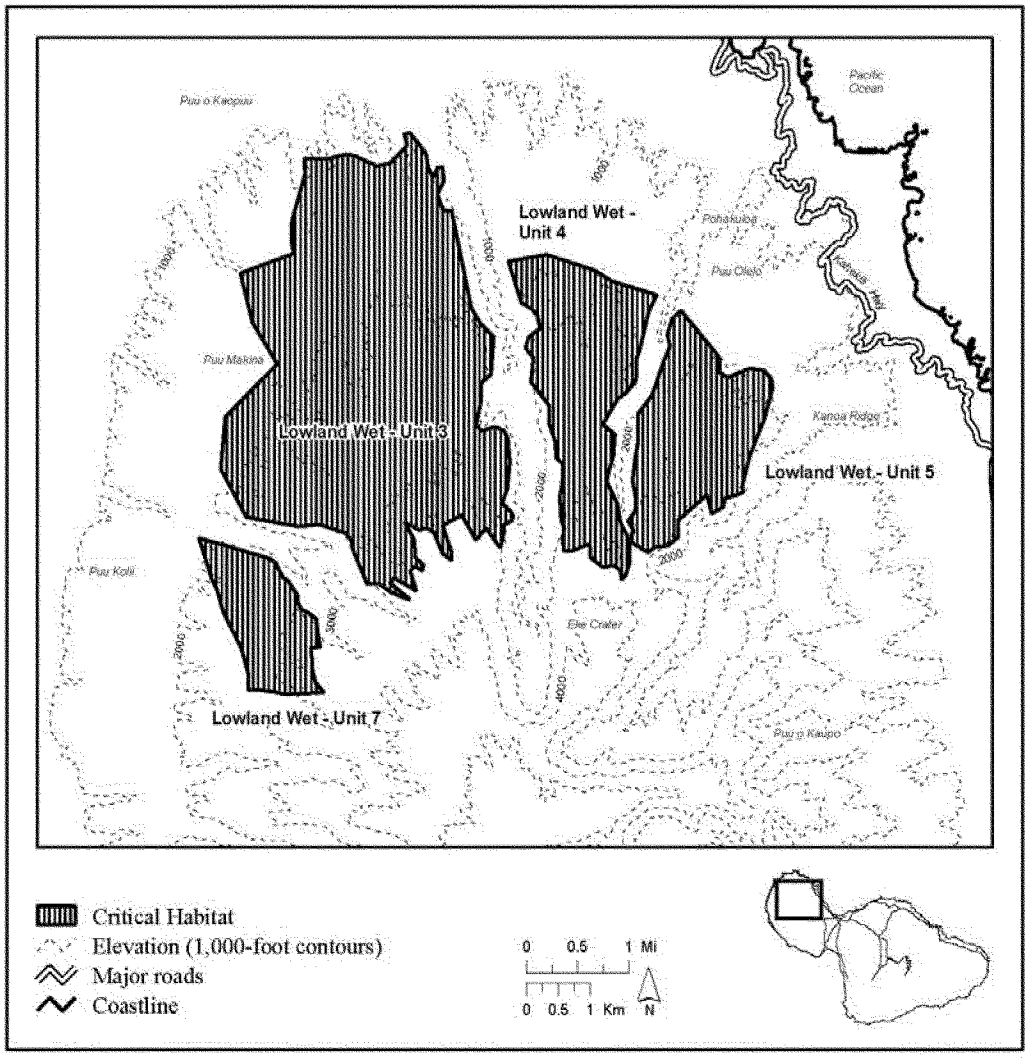
(v) NOTE: Map of *Pseudonestor xanthophrys*—Unit 3—Lowland Wet, *Pseudonestor xanthophrys*—Unit 4—Lowland Wet, *Pseudonestor xanthophrys*—Unit 5—Lowland Wet, and *Pseudonestor xanthophrys*—Unit 7—Lowland Wet follows:

Map 6

Pseudonestor xanthophrys

Lowland Wet

Unit 3, Unit 4, Unit 5 and Unit 7



(9) *Pseudonestor xanthophrys*—Unit 6—Lowland Wet, Maui County, Hawaii (2,112 ac, 855 ha); *Pseudonestor xanthophrys*—Unit 8—Lowland Wet, Maui County, Hawaii (898 ac, 364 ha); and *Pseudonestor xanthophrys*—Unit 9—Lowland Wet, Maui County, Hawaii (230 ac, 93 ha).

(i) [Reserved for textual description of Unit 6.] This unit is critical habitat for the Kiwikiu, *Pseudonestor xanthophrys.*

(ii) [Reserved for textual description of Unit 8.] This unit is critical habitat for the Kiwikiu, *Pseudonestor xanthophrys.*

(iii) [Reserved for textual description of Unit 9.] This unit is critical habitat for the Kiwikiu, *Pseudonestor xanthophrys.*

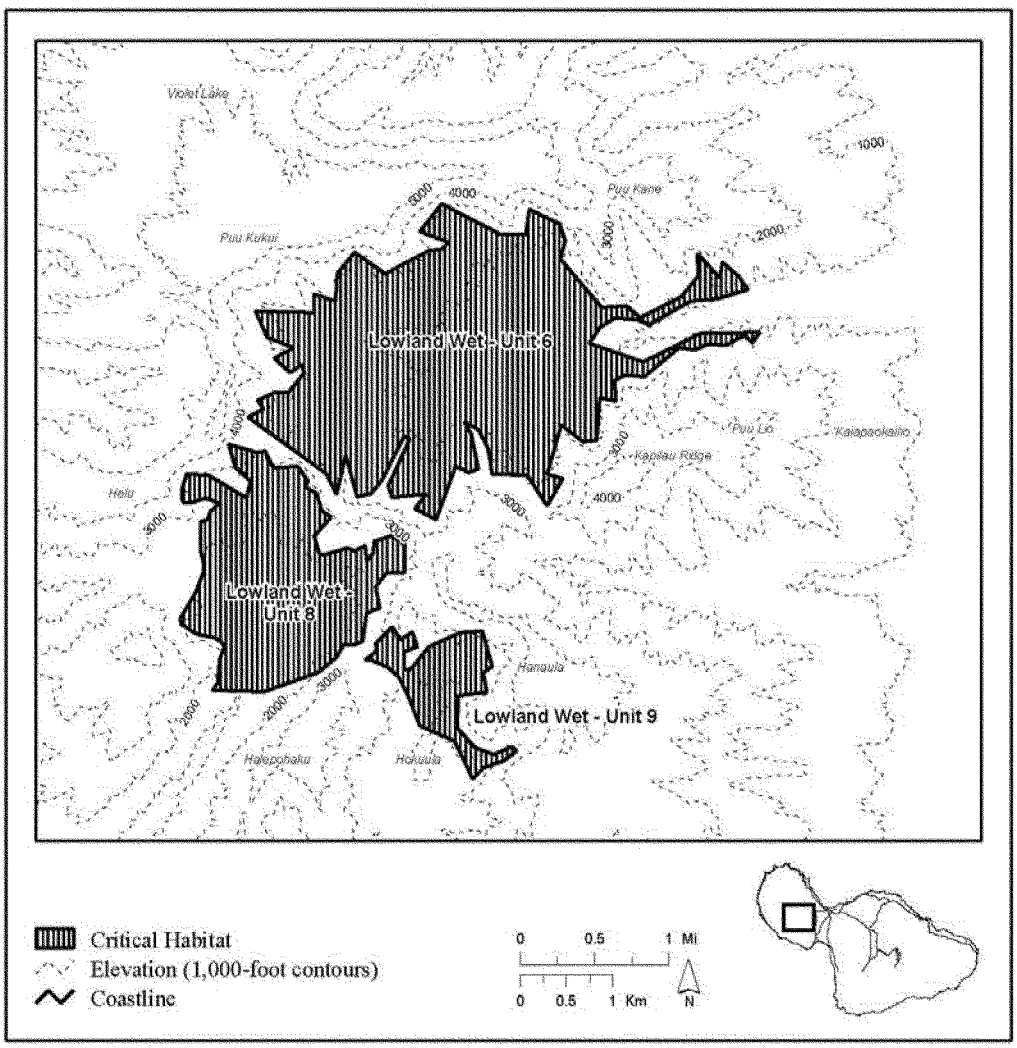
(iv) NOTE: Map of *Pseudonestor xanthophrys*—Unit 6—Lowland Wet, *Pseudonestor xanthophrys*—Unit 8—Lowland Wet, and *Pseudonestor xanthophrys*—Unit 9—Lowland Wet follows:

Map 7

Pseudonestor xanthophrys

Lowland Wet

Unit 6, Unit 8 and Unit 9



(10) *Pseudonestor xanthophrys*—Unit 10—Montane Wet, Maui County, Hawaii (7,815 ac, 3,162 ha); *Pseudonestor xanthophrys*—Unit 11—Montane Wet, Maui County, Hawaii (16,687 ac, 6,753 ha); *Pseudonestor xanthophrys*—Unit 12—Montane Wet, Maui County, Hawaii (2,228 ac, 902 ha); *Pseudonestor xanthophrys*—Unit 13—Montane Wet, Maui County, Hawaii (1,833 ac, 742 ha); and *Pseudonestor xanthophrys*—Unit 14—Montane Wet, Maui County, Hawaii (387 ac, 156 ha).

(i) [Reserved for textual description of Unit 10.] This unit is critical habitat for the Kiwikiu, *Pseudonestor xanthophrys.*

(ii) [Reserved for textual description of Unit 11.] This unit is critical habitat for the Kiwikiu, *Pseudonestor xanthophrys.*

(iii) [Reserved for textual description of Unit 12.] This unit is critical habitat for the Kiwikiu, *Pseudonestor xanthophrys.*

(iv) [Reserved for textual description of Unit 13.] This unit is critical habitat for the Kiwikiu, *Pseudonestor xanthophrys.*

(v) [Reserved for textual description of Unit 14.] This unit is critical habitat for the Kiwikiu, *Pseudonestor xanthophrys.*

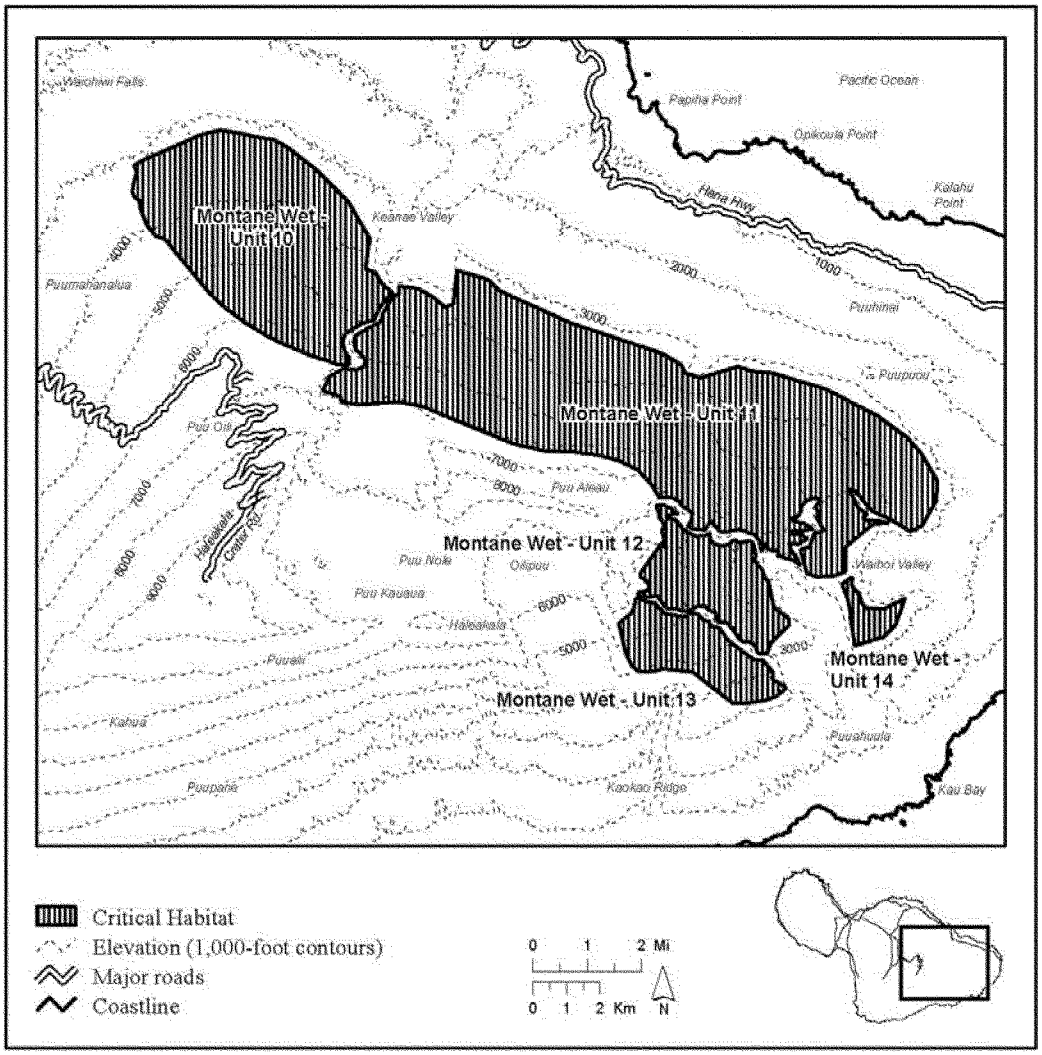
(vi) NOTE: Map of *Pseudonestor xanthophrys*—Unit 10—Montane Wet, *Pseudonestor xanthophrys*—Unit 11—Montane Wet, *Pseudonestor xanthophrys*—Unit 12—Montane Wet, *Pseudonestor xanthophrys*—Unit 13—Montane Wet, and *Pseudonestor xanthophrys*—Unit 14—Montane Wet follows:

Map 8

Pseudonestor xanthophrys

Montane Wet

Unit 10, Unit 11, Unit 12, Unit 13 and Unit 14



(11) *Pseudonestor xanthophrys*—Unit 15—Montane Wet, Maui County, Hawaii (3,964 ac, 1,604 ha); *Pseudonestor xanthophrys*—Unit 16—Montane Wet, Maui County, Hawaii (608 ac, 246 ha); and *Pseudonestor xanthophrys*—Unit 17—Montane Wet, Maui County, Hawaii (46 ac, 19 ha).

(i) [Reserved for textual description of Unit 15.] This unit is critical habitat for the Kiwikiu, *Pseudonestor xanthophrys.*

(ii) [Reserved for textual description of Unit 16.] This unit is critical habitat for the Kiwikiu, *Pseudonestor xanthophrys.*

(iii) [Reserved for textual description of Unit 17.] This unit is critical habitat for the Kiwikiu, *Pseudonestor xanthophrys.*

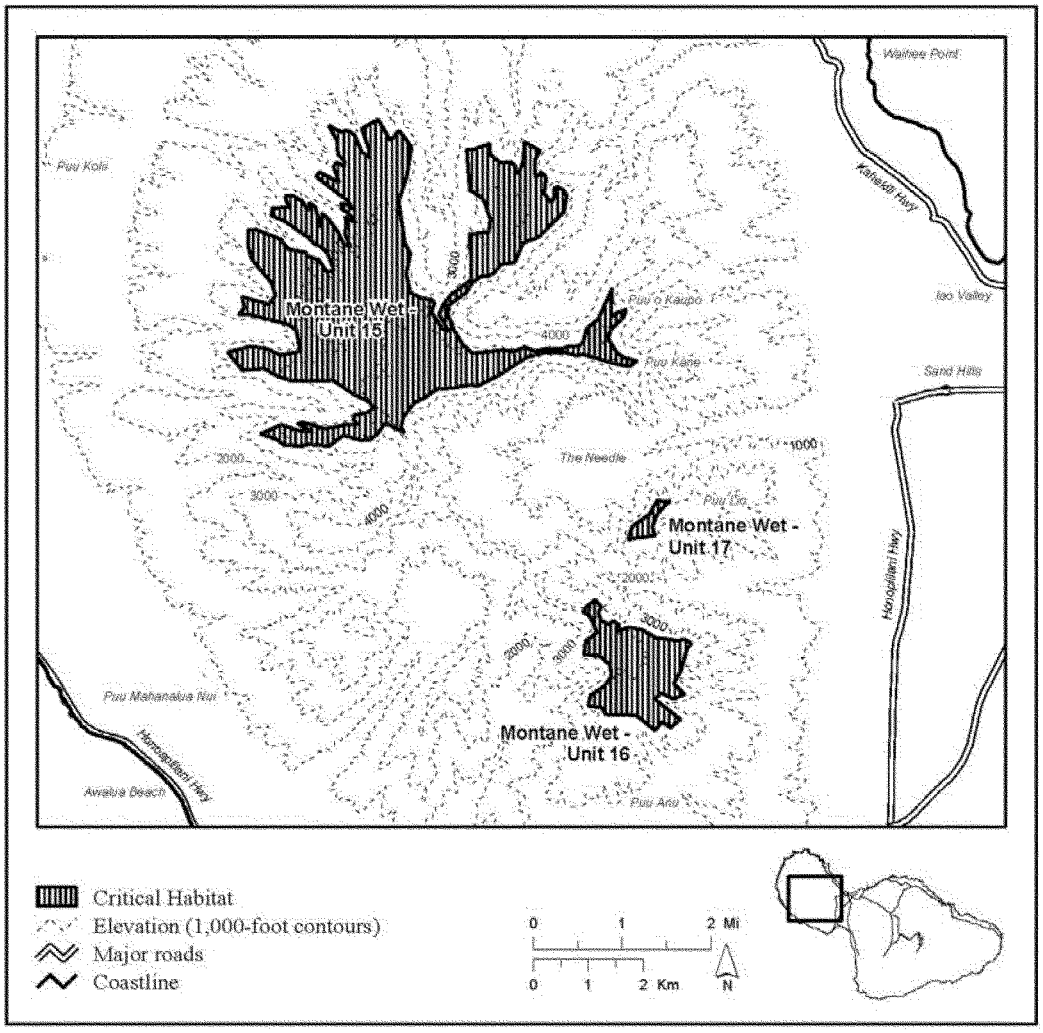
(iv) NOTE: Map of *Pseudonestor xanthophrys*—Unit 15—Montane Wet, *Pseudonestor xanthophrys*—Unit 16—Montane Wet, and *Pseudonestor xanthophrys*—Unit 17—Montane Wet follows:

Map 9

Pseudonestor xanthophrys

Montane Wet

Unit 15, Unit 16 and Unit 17



(12) *Pseudonestor xanthophrys*—Unit 18—Montane Mesic, Maui County, Hawaii (20,972 ac, 8,487 ha).

(i) [Reserved for textual description of Unit 18.] This unit is critical habitat for the Kiwikiu, *Pseudonestor xanthophrys.*

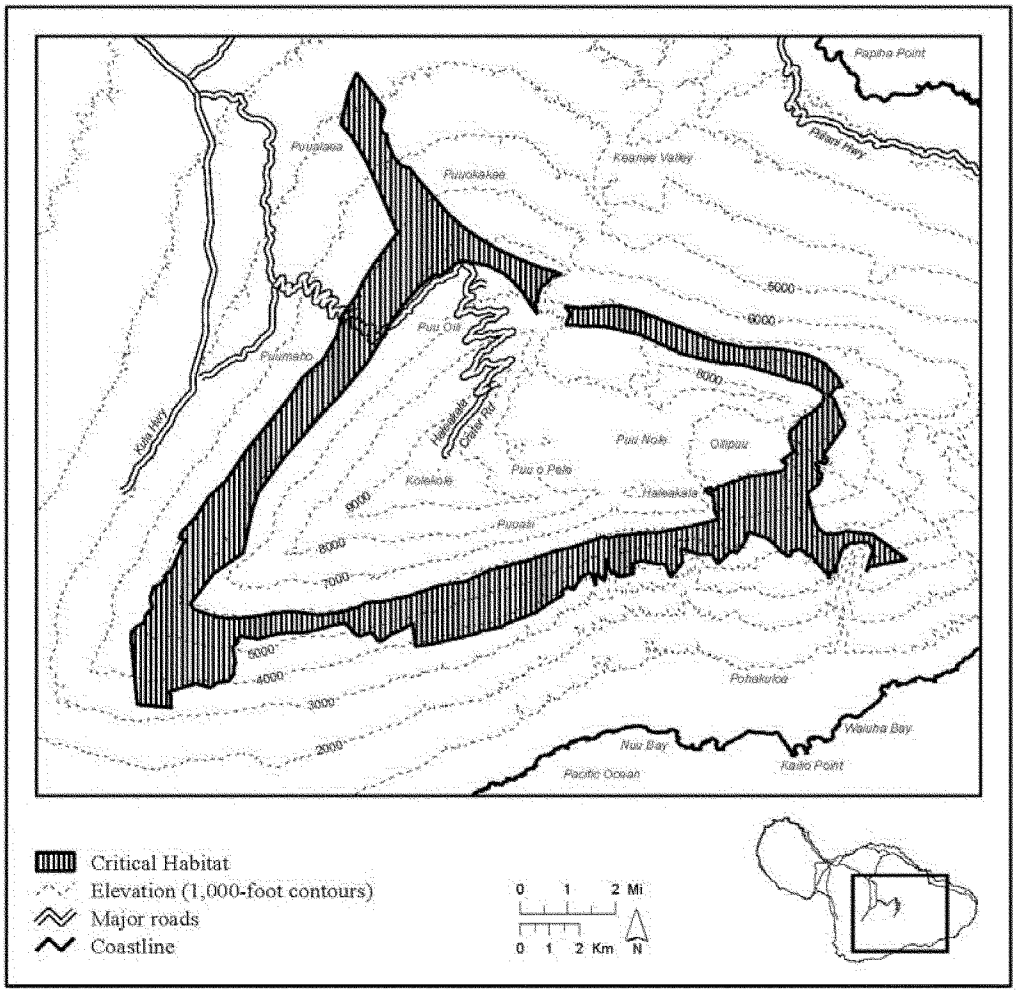
(ii) NOTE: Map of *Pseudonestor xanthophrys*—Unit 18—Montane Mesic follows:

Map 10

Pseudonestor xanthophrys

Montane Mesic

Unit 18



(13) *Pseudonestor xanthophrys*—Unit 19—Montane Mesic, Maui County, Hawaii (366 ac, 148 ha); *Pseudonestor xanthophrys*—Unit 20—Montane Mesic, Maui County, Hawaii (218 ac, 88 ha); *Pseudonestor xanthophrys*—Unit 21—Montane Mesic, Maui County, Hawaii (72 ac, 29 ha); *Pseudonestor xanthophrys*—Unit 22—Montane Mesic, Maui County, Hawaii (304 ac, 123 ha); and *Pseudonestor xanthophrys*—Unit 23—Montane Mesic, Maui County, Hawaii (94 ac, 38 ha).

(i) [Reserved for textual description of Unit 19.] This unit is critical habitat for the Kiwikiu, *Pseudonestor xanthophrys.*

(ii) [Reserved for textual description of Unit 20.] This unit is critical habitat for the Kiwikiu, *Pseudonestor xanthophrys.*

(iii) [Reserved for textual description of Unit 21.] This unit is critical habitat for the Kiwikiu, *Pseudonestor xanthophrys.*

(iv) [Reserved for textual description of Unit 22.] This unit is critical habitat for the Kiwikiu, *Pseudonestor xanthophrys.*

(v) [Reserved for textual description of Unit 23.] This unit is critical habitat for the Kiwikiu, *Pseudonestor xanthophrys.*

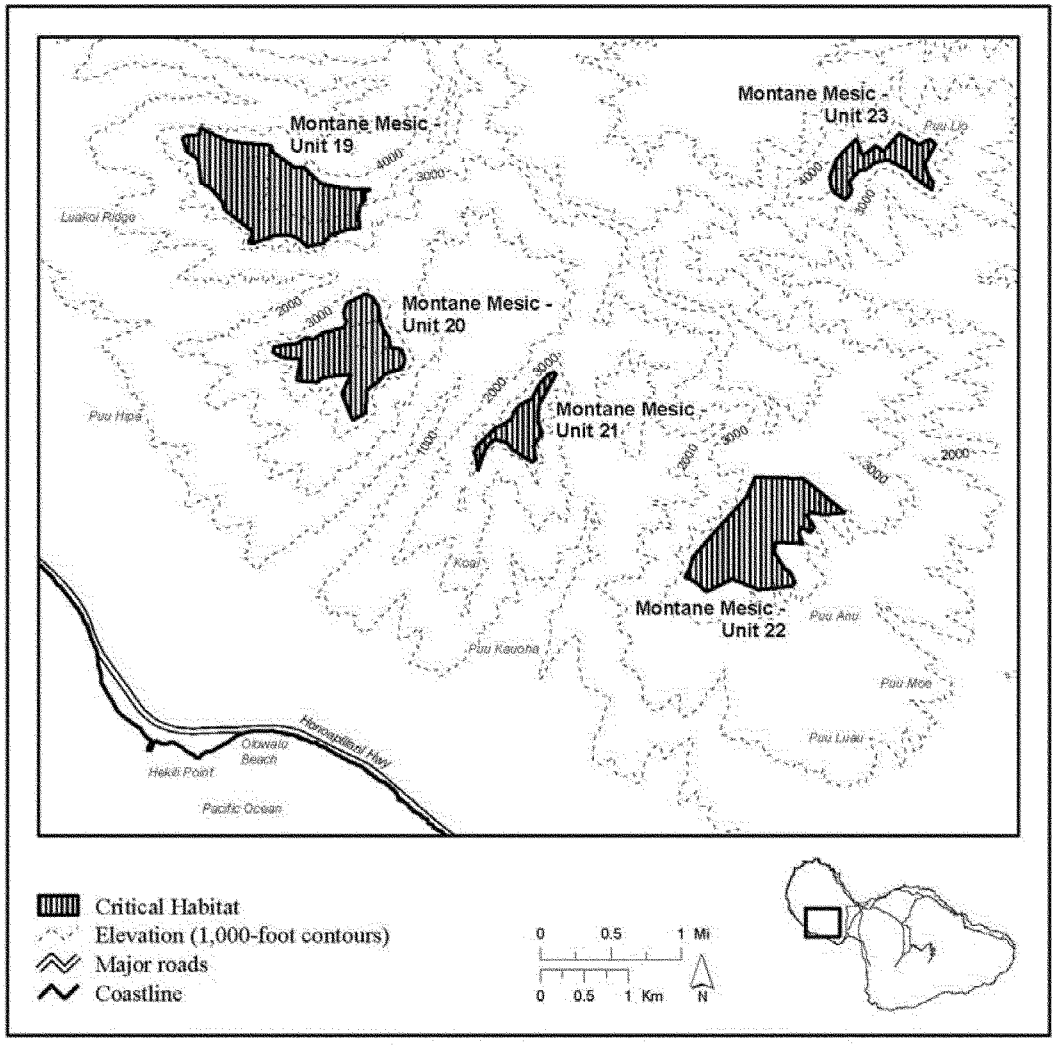
(vi) NOTE: Map of *Pseudonestor xanthophrys*—Unit 19—Montane Mesic, *Pseudonestor xanthophrys*—Unit 20—Montane Mesic, *Pseudonestor xanthophrys*—Unit 21—Montane Mesic, *Pseudonestor xanthophrys*—Unit 22—Montane Mesic, and *Pseudonestor xanthophrys*—Unit 23—Montane Mesic follows:

Map 11

Pseudonestor xanthophrys

Montane Mesic

Unit 19, Unit 20, Unit 21, Unit 22 and Unit 23



(14) *Pseudonestor xanthophrys*—Unit 24—Subalpine, Maui County, Hawaii (19,401 ac, 7,851 ha), and *Pseudonestor xanthophrys*—Unit 25—Subalpine, Maui County, Hawaii (10,931 ac, 4,424 ha).

(i) [Reserved for textual description of Unit 24.] This unit is critical habitat for the Kiwikiu, *Pseudonestor xanthophrys.*

(ii) [Reserved for textual description of Unit 25.] This unit is critical habitat for the Kiwikiu, *Pseudonestor xanthophrys.*

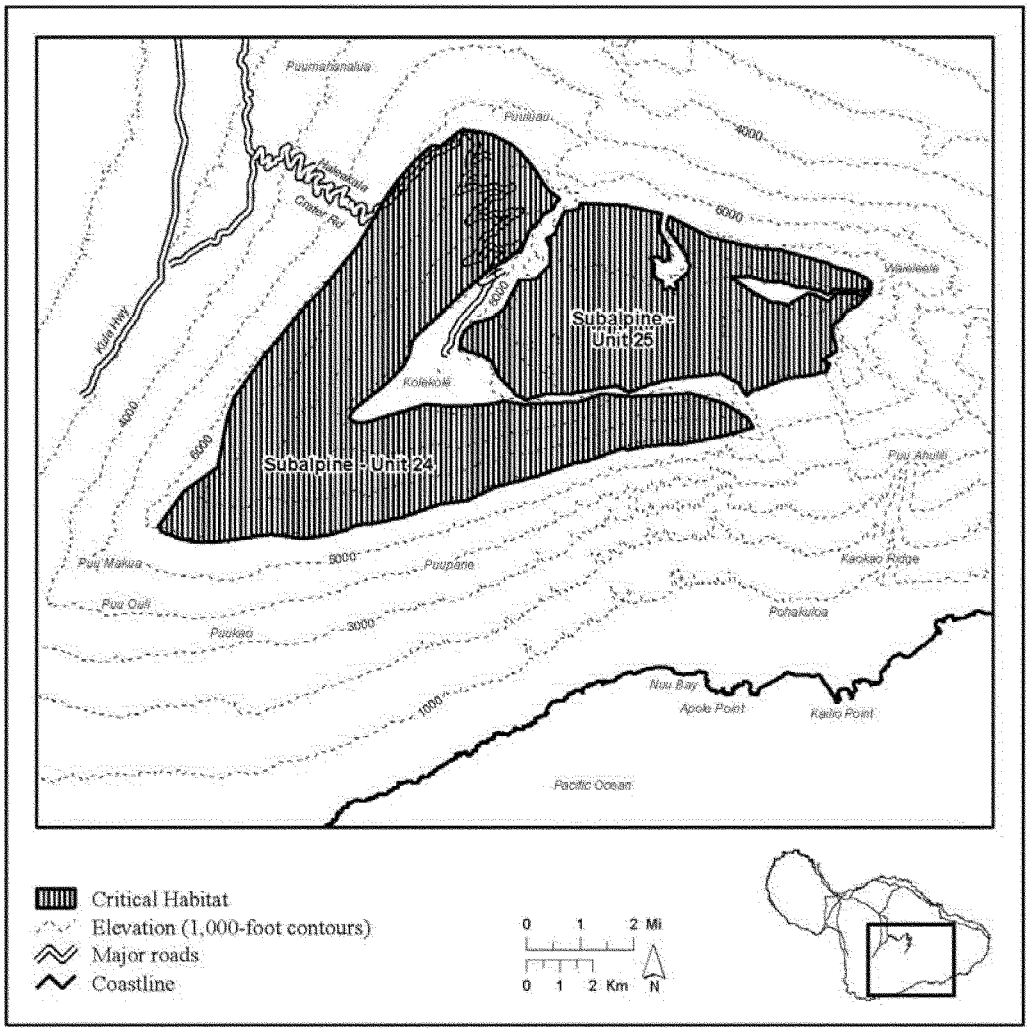
(iii) NOTE: Map of *Pseudonestor xanthophrys*—Unit 24—Subalpine and *Pseudonestor xanthophrys*—Unit 25—Subalpine follows:

Map 12

Pseudonestor xanthophrys

Subalpine

Unit 24 and Unit 24



(15) *Pseudonestor xanthophrys*—Unit 26—Dry Cliff, Maui County, Hawaii (1,018 ac, 412 ha); *Pseudonestor xanthophrys*—Unit 27—Dry Cliff, Maui County, Hawaii (293 ac, 119 ha); and *Pseudonestor xanthophrys*—Unit 28—Dry Cliff, Maui County, Hawaii (315 ac, 127 ha).

(i) [Reserved for textual description of Unit 26.] This unit is critical habitat for the Kiwikiu, *Pseudonestor xanthophrys.*

(ii) [Reserved for textual description of Unit 27.] This unit is critical habitat for the Kiwikiu, *Pseudonestor xanthophrys.*

(iii) [Reserved for textual description of Unit 28.] This unit is critical habitat for the Kiwikiu, *Pseudonestor xanthophrys.*

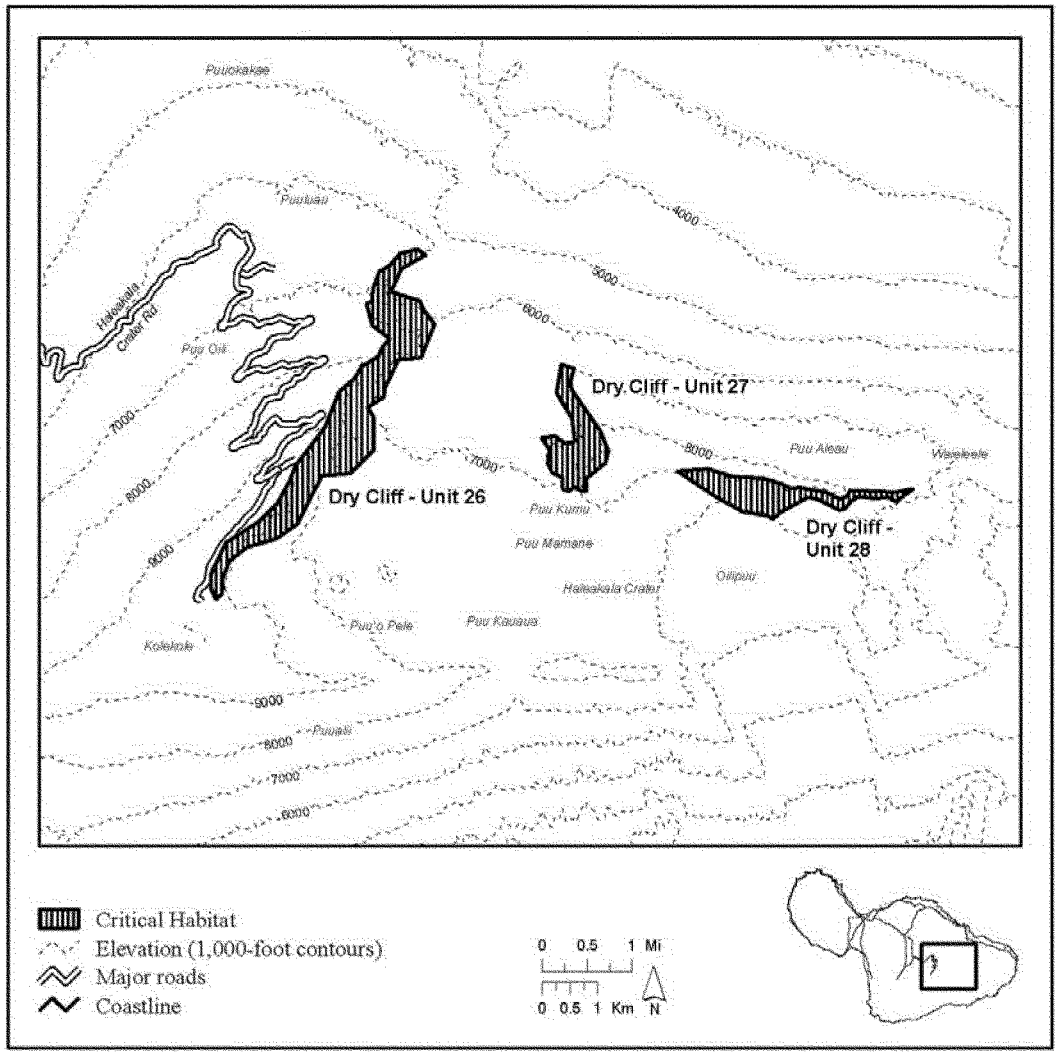
(iv) NOTE: Map of *Pseudonestor xanthophrys*—Unit 26—Dry Cliff, *Pseudonestor xanthophrys*—Unit 27—Dry Cliff, and *Pseudonestor xanthophrys*—Unit 28—Dry Cliff follows:

Map 13

Pseudonestor xanthophrys

Dry Cliff

Unit 26, Unit 27 and Unit 28



(16) *Pseudonestor xanthophrys*—Unit 29—Dry Cliff, Maui County, Hawaii (1,536 ac, 622 ha).

(i) [Reserved for textual description of Unit 29.] This unit is critical habitat for the Kiwikiu, *Pseudonestor xanthophrys.*

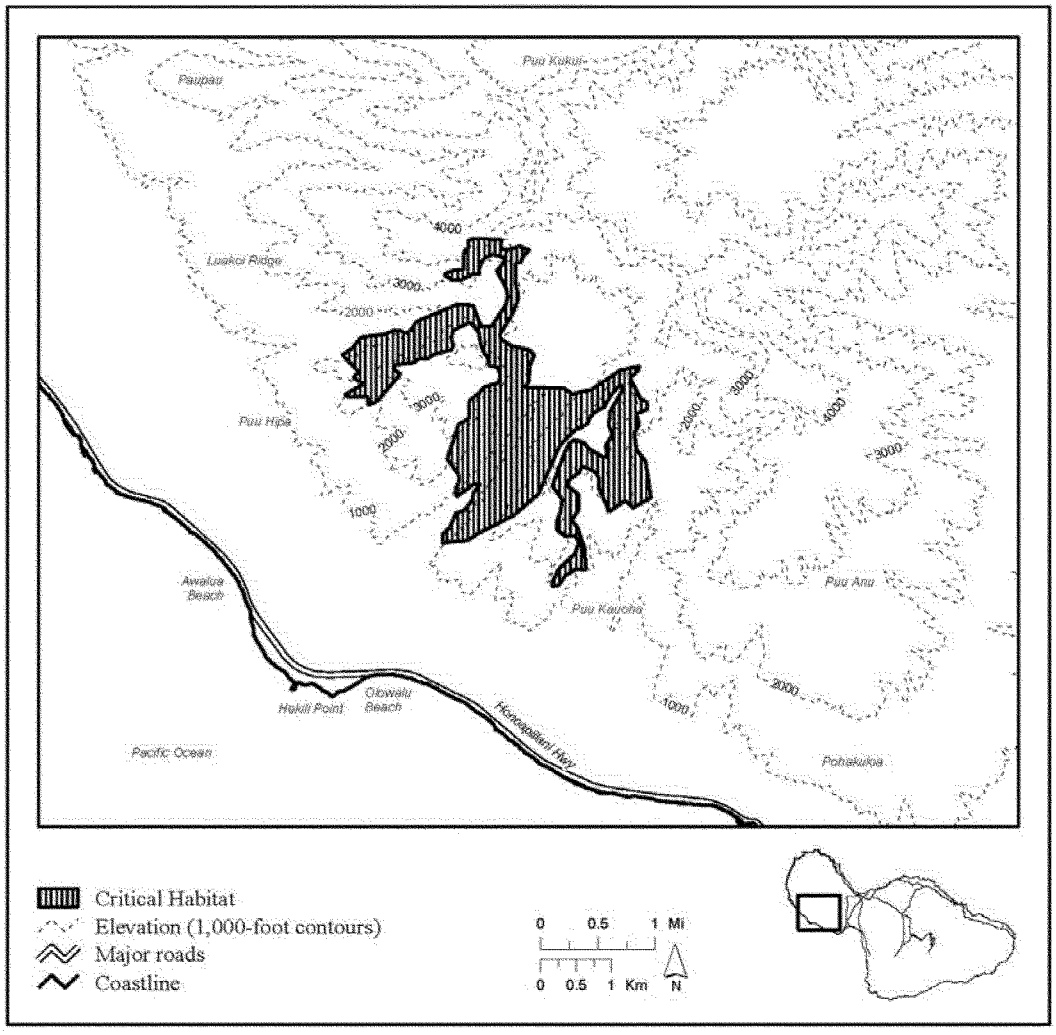
(ii) NOTE: Map of *Pseudonestor xanthophrys*—Unit 29—Dry Cliff follows:

Map 14

Pseudonestor xanthophrys

Dry Cliff

Unit 29



(17) *Pseudonestor xanthophrys*—Unit 30—Wet Cliff, Maui County, Hawaii (460 ac, 186 ha).

(i) [Reserved for textual description of Unit 30.] This unit is critical habitat for the Kiwikiu, *Pseudonestor xanthophrys.*

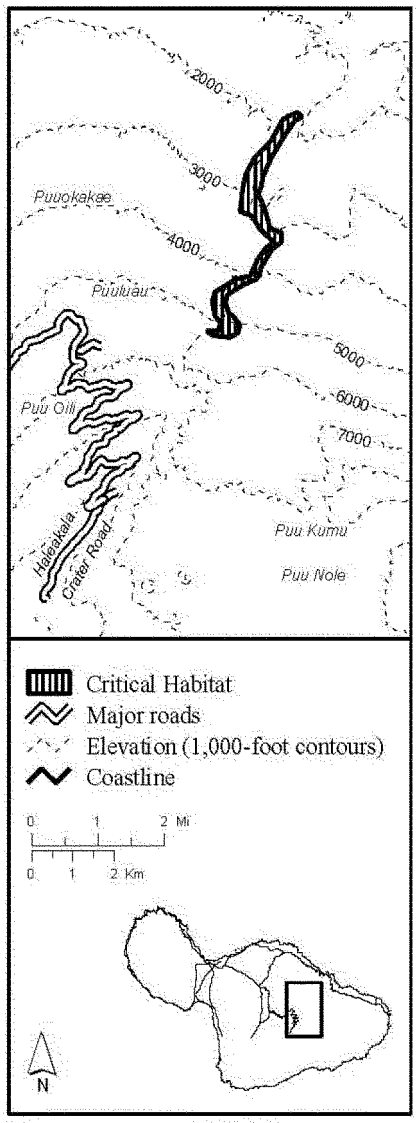
(ii) NOTE: Map of *Pseudonestor xanthophrys*—Unit 30—Wet Cliff follows:

Map 15

Pseudonestor xanthophrys

Wet Cliff

Unit 30



(18) *Pseudonestor xanthophrys*—Unit 31—Wet Cliff, Maui County, Hawaii (1,407 ac, 569 ha); *Pseudonestor xanthophrys*—Unit 32—Wet Cliff, Maui County, Hawaii (438 ac, 177 ha); and *Pseudonestor xanthophrys*—Unit 33—Wet Cliff, Maui County, Hawaii (184 ac, 75 ha).

(i) [Reserved for textual description of Unit 31.] This unit is critical habitat for the Kiwikiu, *Pseudonestor xanthophrys.*

(ii) [Reserved for textual description of Unit 32.] This unit is critical habitat for the Kiwikiu, *Pseudonestor xanthophrys.*

(iii) [Reserved for textual description of Unit 33.] This unit is critical habitat for the Kiwikiu, *Pseudonestor xanthophrys.*

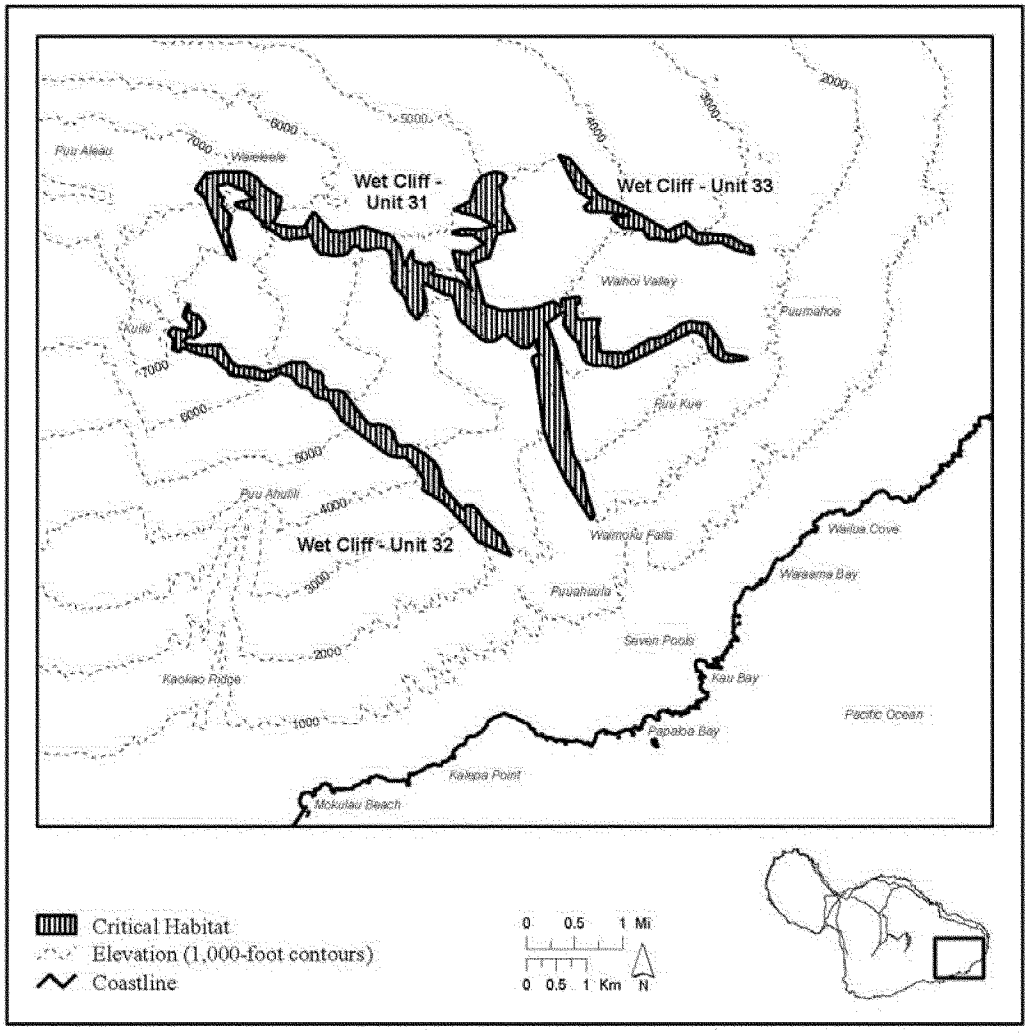
(iv) NOTE: Map of *Pseudonestor xanthophrys*—Unit 31—Wet Cliff, *Pseudonestor xanthophrys*—Unit 31—Wet Cliff, and *Pseudonestor xanthophrys*—Unit 31—Wet Cliff follows:

Map 16

Pseudonestor xanthophrys

Wet Cliff

Unit 31, Unit 32 and Unit 33



(19) *Pseudonestor xanthophrys*—Unit 34—Wet Cliff, Maui County, Hawaii (2,048 ac, 829 ha); *Pseudonestor xanthophrys*—Unit 35—Wet Cliff, Maui County, Hawaii (9,103 ac, 3,684 ha); and *Pseudonestor xanthophrys*—Unit 36—Wet Cliff, Maui County, Hawaii (781 ac, 316 ha).

(i) [Reserved for textual description of Unit 34.] This unit is critical habitat for the Kiwikiu, *Pseudonestor xanthophrys.*

(ii) [Reserved for textual description of Unit 35.] This unit is critical habitat for the Kiwikiu, *Pseudonestor xanthophrys.*

(iii) [Reserved for textual description of Unit 36.] This unit is critical habitat for the Kiwikiu, *Pseudonestor xanthophrys.*

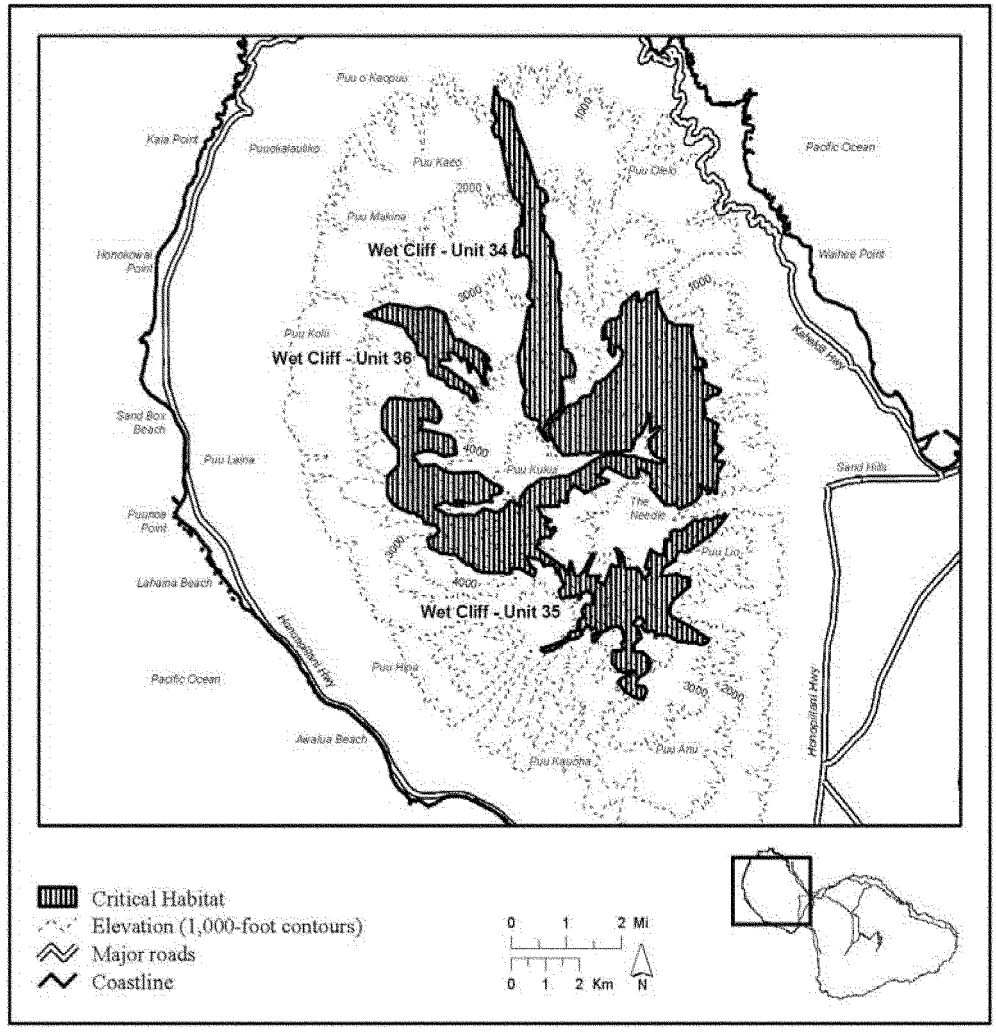
(iv) NOTE: Map of *Pseudonestor xanthophrys*—Unit 34—Wet Cliff, *Pseudonestor xanthophrys*—Unit 35—Wet Cliff, and *Pseudonestor xanthophrys*—Unit 36—Wet Cliff follows:

Map 17

Pseudonestor xanthophrys

Wet Cliff

Unit 34, Unit 35 and Unit 36



(20) *Pseudonestor xanthophrys*—Unit 37—Lowland Mesic, Maui County, Hawaii (10,330 ac, 4,180 ha).

(i) [Reserved for textual description of Unit 37.] This unit is critical habitat for the Kiwikiu, *Pseudonestor xanthophrys.*

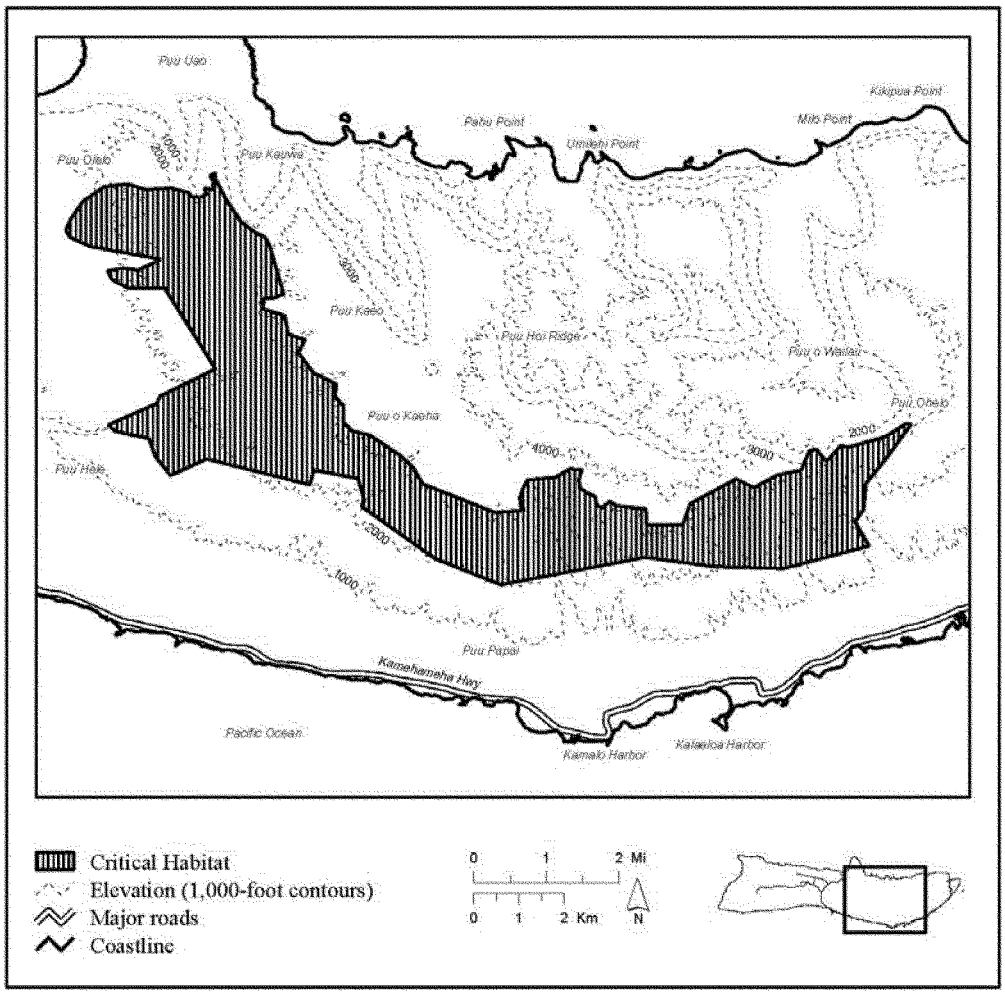
(ii) NOTE: Map of *Pseudonestor xanthophrys*—Unit 37—Lowland Mesic follows:

Map 18

Pseudonestor xanthophrys

Lowland Mesic

Unit 37



(21) *Pseudonestor xanthophrys*—Unit 38—Lowland Wet, Maui County, Hawaii (3,628 ac, 1,468 ha), and *Pseudonestor xanthophrys*—Unit 39—Lowland Wet, Maui County, Hawaii (1,952 ac, 790 ha).

(i) [Reserved for textual description of Unit 38.] This unit is critical habitat for the Kiwikiu, *Pseudonestor xanthophrys.*

(ii) [Reserved for textual description of Unit 39.] This unit is critical habitat for the Kiwikiu, *Pseudonestor xanthophrys.*

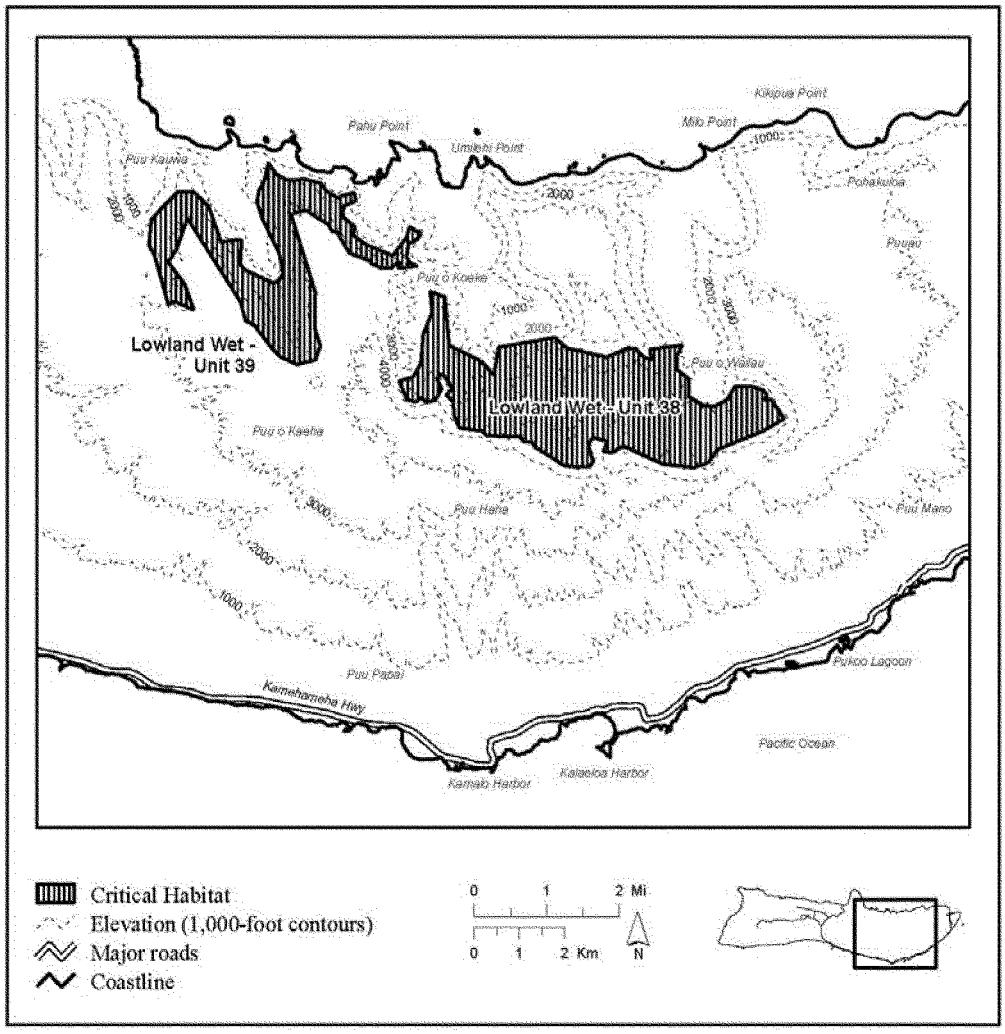
(iii) NOTE: Map of *Pseudonestor xanthophrys*—Unit 38—Lowland Wet and *Pseudonestor xanthophrys*—Unit 39—Lowland Wet follows:

Map 19

Pseudonestor xanthophrys

Lowland Wet

Unit 38 and Unit 39



(22) *Pseudonestor xanthophrys*—Unit 40—Montane Wet, Maui County, Hawaii (4,818 ac, 1,950 ha), and *Pseudonestor xanthophrys*—Unit 41—Montane Wet, Maui County, Hawaii (910 ac, 368 ha).

(i) [Reserved for textual description of Unit 40.] This unit is critical habitat for the Kiwikiu, *Pseudonestor xanthophrys.*

(ii) [Reserved for textual description of Unit 41.] This unit is critical habitat for the Kiwikiu, *Pseudonestor xanthophrys.*

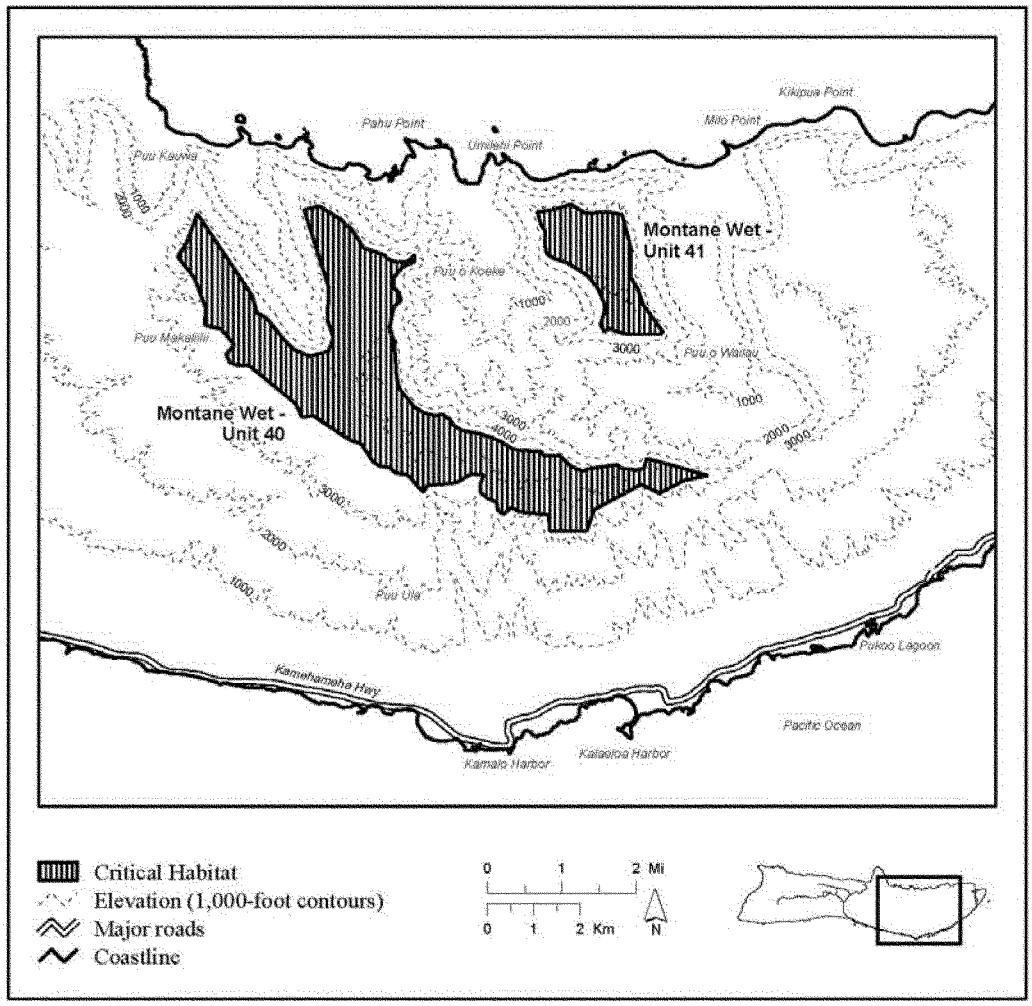
(iii) NOTE: Map of *Pseudonestor xanthophrys*—Unit 40—Montane Wet and *Pseudonestor xanthophrys*—Unit 41—Montane Wet follows:

Map 20

Pseudonestor xanthophrys

Montane Wet

Unit 40 and Unit 41



(23) *Pseudonestor xanthophrys*—Unit 42—Montane Mesic, Maui County, Hawaii (1,629 ac, 659 ha).

(i) [Reserved for textual description of Unit 42.] This unit is critical habitat for the Kiwikiu, *Pseudonestor xanthophrys.*

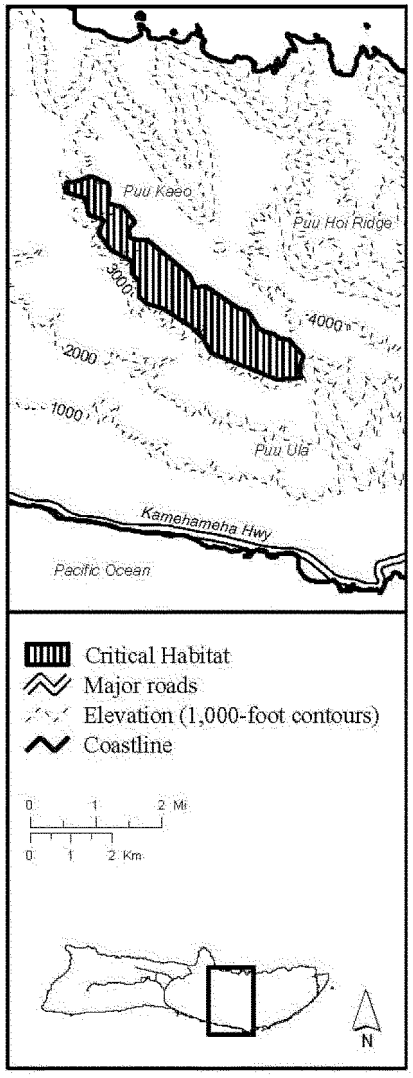
(ii) NOTE: Map of *Pseudonestor xanthophrys*—Unit 42—Montane Mesic follows:

Map 21

Pseudonestor xanthophrys

Montane Mesic

Unit 42



(24) *Pseudonestor xanthophrys*—Unit 43—Wet Cliff, Maui County, Hawaii (1,888 ac, 764 ha), and *Pseudonestor xanthophrys*—Unit 44—Wet Cliff, Maui County, Hawaii (1,280 ac, 518 ha).

(i) [Reserved for textual description of Unit 43.] This unit is critical habitat for the Kiwikiu, *Pseudonestor xanthophrys.*

(ii) [Reserved for textual description of Unit 44.] This unit is critical habitat for the Kiwikiu, *Pseudonestor xanthophrys.*

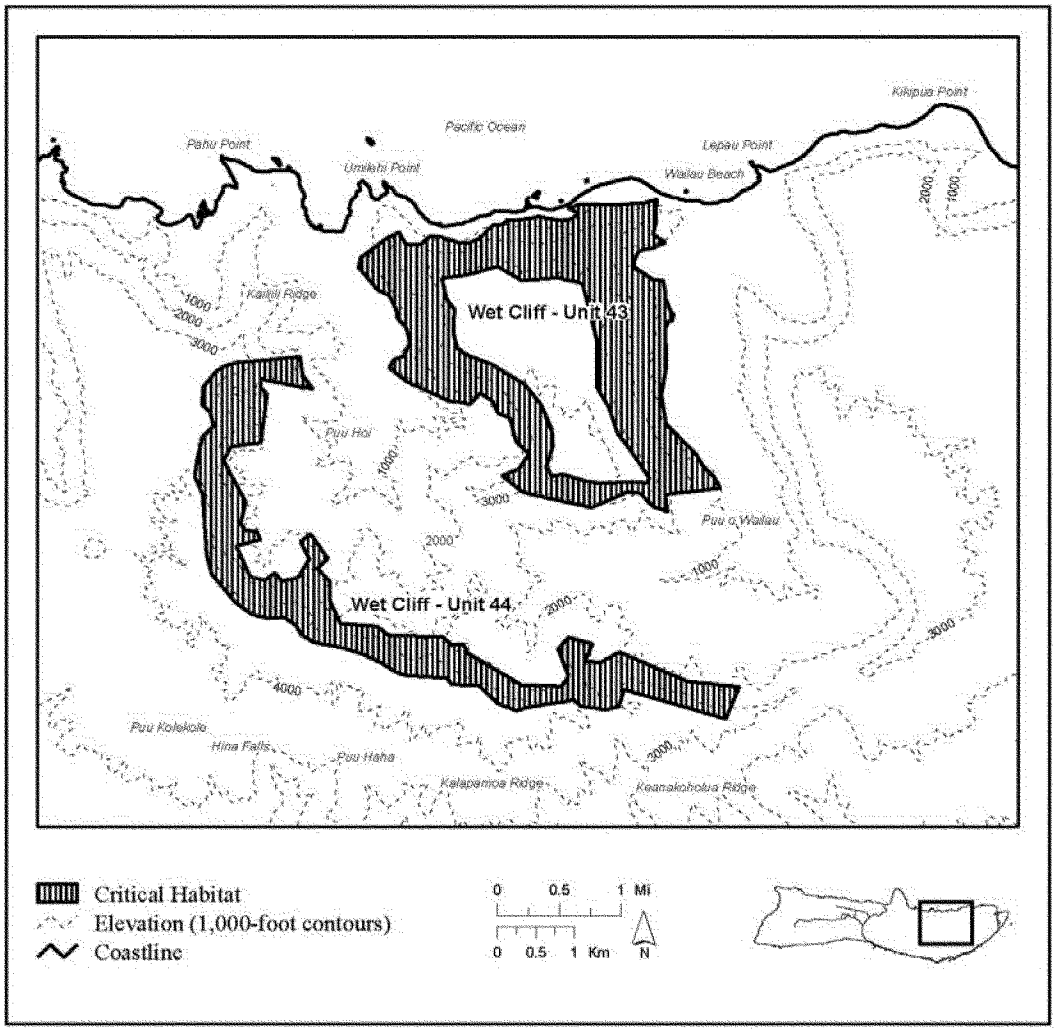
(iii) NOTE: Map of *Pseudonestor xanthophrys*—Unit 43—Wet Cliff and *Pseudonestor xanthophrys*—Unit 44—Wet Cliff follows:

Map 22

Pseudonestor xanthophrys

Wet Cliff

Unit 43 and Unit 44



* * * * *

(f) *Clams and Snails.*

* * * * *

Lanai tree snail (*Partulina semicarinata*)

(1) Critical habitat units are depicted for Maui County, Hawaii, on the maps below.

(2) *Primary constituent elements.*

(i) In units 1 and 2, the primary constituent elements of critical habitat for the Lanai tree snail are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

(ii) In unit 3, the primary constituent elements of critical habitat for the Lanai tree snail are:

(A) Elevation: Between 3,300 and 6,500 ft (1,000 and 2,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Well-developed soils, montane bogs.

(D) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(E) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(F) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

(iii) In units 4 and 5, the primary constituent elements of critical habitat for the Lanai tree snail are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.

(D) Canopy: None.

(E) Subcanopy: *Broussaisia, Cheirodendron, Leptecophylla, Metrosideros.*

(F) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

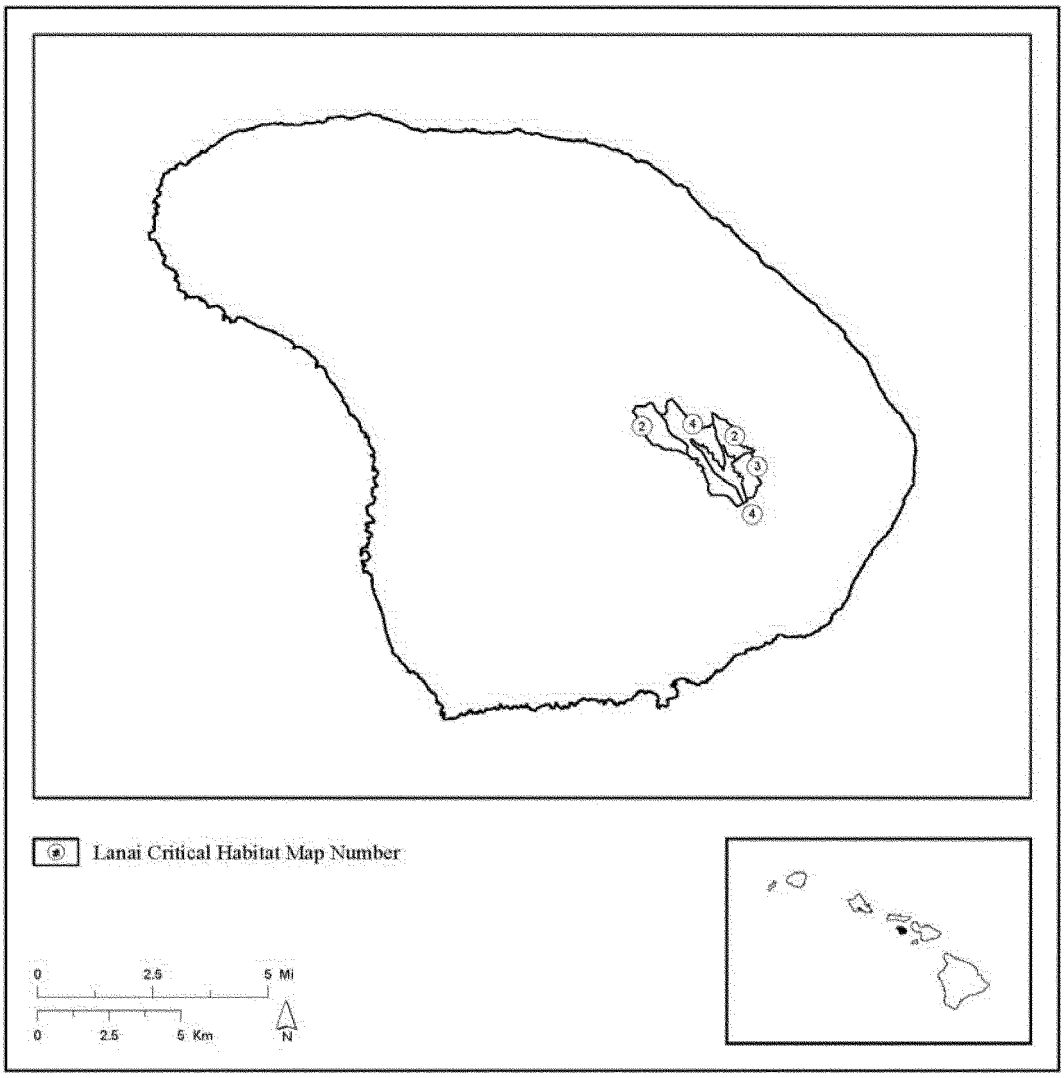
(3) Existing manmade features and structures, such as buildings, roads, railroads, airports, runways, other paved areas, lawns, and other urban landscaped areas, do not contain one or more of the physical or biological features. Federal actions limited to those areas, therefore, would not trigger a consultation under section 7 of the Act unless they may affect the species or physical or biological features in adjacent critical habitat.

(4) *Critical habitat maps.* Maps were created in GIS, with coordinates in UTM Zone 4, units in meters using North American datum of 1983 (NAD 83).

(5) Index map of critical habitat units for the Lanai tree snail (*Partulina semicarinata*) follows:

Map 1

***Partulina semicarinata*—Index Map**



(6) *Partulina semicarinata*—Unit 1—Lowland Wet, Maui County, Hawaii (374 ac, 152 ha), and *Partulina semicarinata*—Unit 2—Lowland Wet, Maui County, Hawaii (232 ac, 94 ha).

(i) [Reserved for textual description of Unit 1.]. This unit is critical habitat for the Lanai tree snail, *Partulina semicarinata.*

(ii) [Reserved for textual description of Unit 2.]. This unit is critical habitat for the Lanai tree snail, *Partulina semicarinata.*

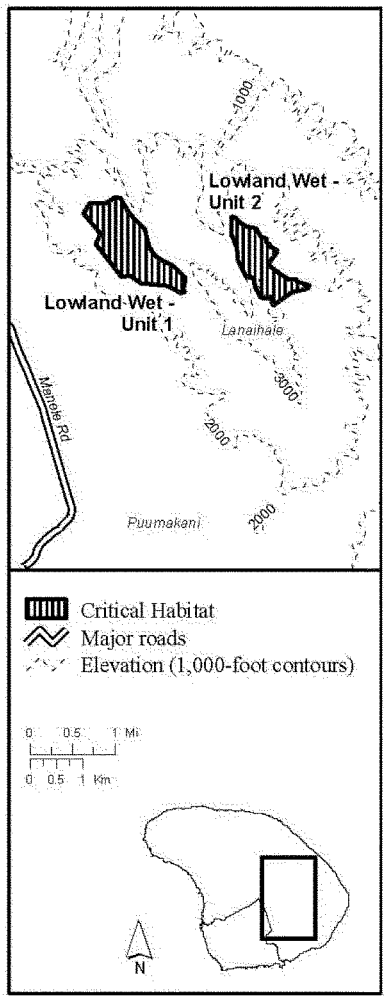
(iii) NOTE: Map of *Partulina semicarinata*—Unit 1—Lowland Wet and *Partulina semicarinata*—Unit 2—Lowland Wet follows:

Map 2

Partulina semicarinata

Lowland Wet

Unit 1 and Unit 2



(7) *Partulina semicarinata*—Unit 3—Montane Wet, Maui County, Hawaii (248 ac, 101 ha).

(i) [Reserved for textual description of Unit 3.]. This unit is critical habitat for the Lanai tree snail, *Partulina semicarinata.*

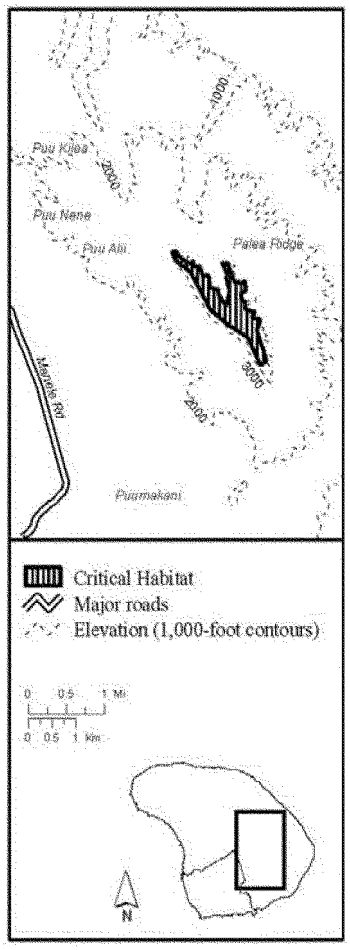
(ii) NOTE: Map of *Partulina semicarinata*—Unit 3—Montane Wet follows:

Map 3

Partulina semicarinata

Montane Wet

Unit 3



(8) *Partulina semicarinata*—Unit 4—Wet Cliff, Maui County, Hawaii (731 ac, 296 ha), and *Partulina semicarinata*—Unit 5—Wet Cliff, Maui County, Hawaii (230 ac, 93 ha).

(i) [Reserved for textual description of Unit 4.]. This unit is critical habitat for the Lanai tree snail, *Partulina semicarinata.*

(ii) [Reserved for textual description of Unit 5.]. This unit is critical habitat for the Lanai tree snail, *Partulina semicarinata.*

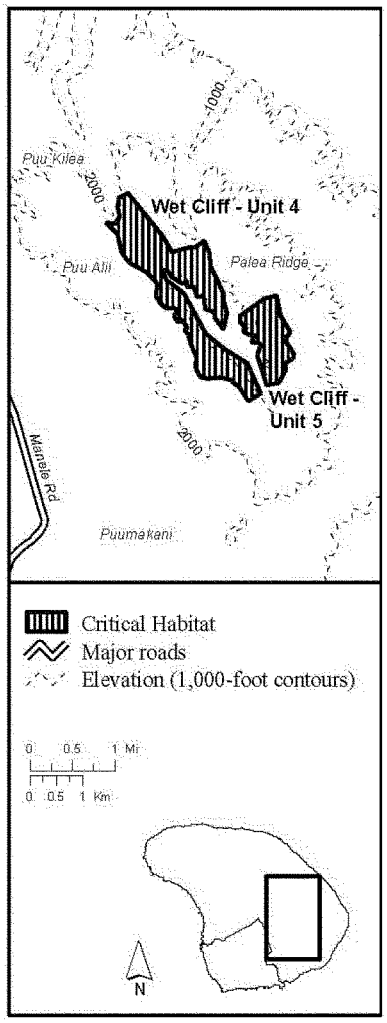
(iii) NOTE: Map of *Partulina semicarinata*—Unit 4—Wet Cliff and *Partulina semicarinata*—Unit 5—Wet Cliff follows:

Map 4

Partulina semicarinata

Wet Cliff

Unit 4 and Unit 5



Lanai tree snail (*Partulina variabilis*)

(1) Critical habitat units are depicted for Maui County, Hawaii, on the maps below.

(2) *Primary constituent elements.*

(i) In units 1 and 2, the primary constituent elements of critical habitat for the Lanai tree snail are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

(ii) In unit 3, the primary constituent elements of critical habitat for the Lanai tree snail are:

(A) Elevation: Between 3,300 and 6,500 ft (1,000 and 2,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Well-developed soils, montane bogs.

(D) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(E) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(F) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

(iii) In units 4 and 5, the primary constituent elements of critical habitat for the Lanai tree snail are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.

(D) Canopy: None.

(E) Subcanopy: *Broussaisia, Cheirodendron, Leptecophylla, Metrosideros.*

(F) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

(3) Existing manmade features and structures, such as buildings, roads, railroads, airports, runways, other paved areas, lawns, and other urban landscaped areas, do not contain one or more of the physical or biological features. Federal actions limited to those areas, therefore, would not trigger a consultation under section 7 of the Act unless they may affect the species or physical or biological features in adjacent critical habitat.

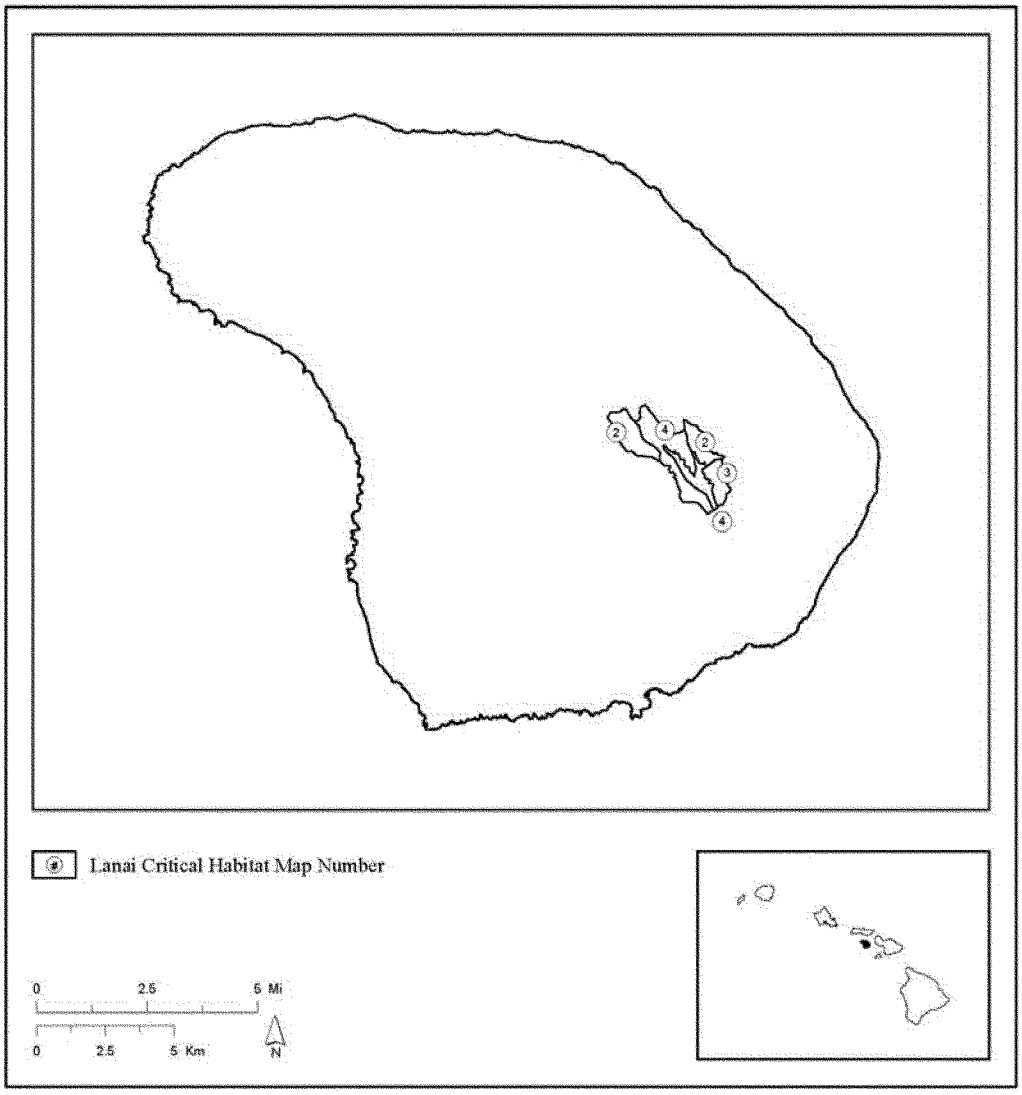
(4) *Critical habitat maps.* Maps were created in GIS, with coordinates in UTM Zone 4, units in meters using North American datum of 1983 (NAD 83).

(5) Index map of critical habitat units for the Lanai tree snail (*Partulina variabilis*) follows:

Map 1

Partulina variabilis

Index Map



(6) *Partulina variabilis*—Unit 1—Lowland Wet, Maui County, Hawaii (374 ac, 152 ha), and *Partulina variabilis*—Unit 2—Lowland Wet, Maui County, Hawaii (232 ac, 94 ha).

(i) [Reserved for textual description of Unit 1.]. This unit is critical habitat for the Lanai tree snail, *Partulina variabilis*.

(ii) [Reserved for textual description of Unit 2.]. This unit is critical habitat for the Lanai tree snail, *Partulina variabilis*.

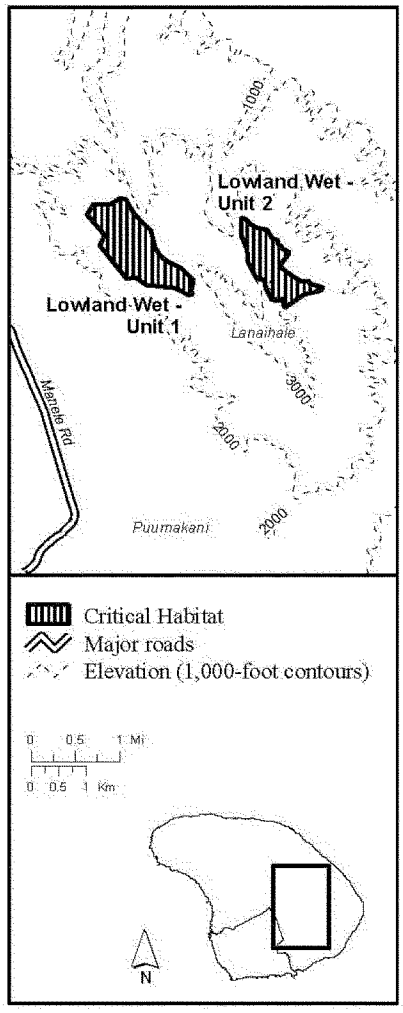
(iii) NOTE: Map of *Partulina variabilis*—Unit 1—Lowland Wet and *Partulina variabilis*—Unit 2—Lowland Wet follows:

Map 2

Partulina variabilis

Lowland Wet

Unit 1 and Unit 2



(7) *Partulina variabilis*—Unit 3—Montane Wet, Maui County, Hawaii (248 ac, 101 ha).

(i) [Reserved for textual description of Unit 3.]. This unit is critical habitat for the Lanai tree snail, *Partulina variabilis*.

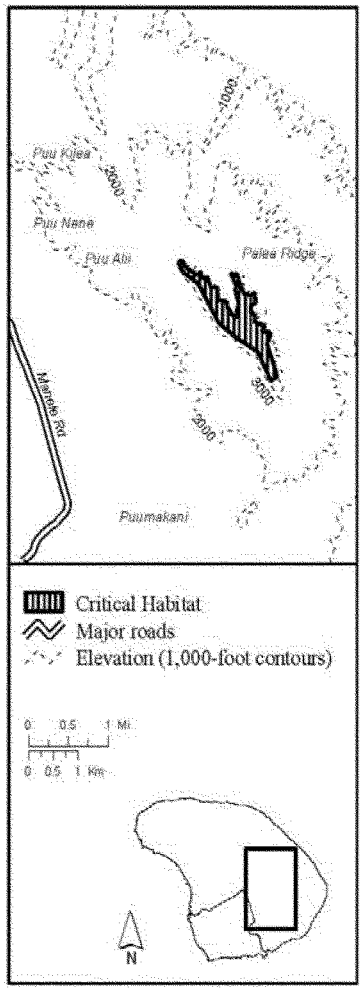
(ii) NOTE: Map of *Partulina variabilis*—Unit 3—Montane Wet follows:

Map 3

Partulina variabilis

Montane Wet

Unit 3



(8) *Partulina variabilis*—Unit 4—Wet Cliff, Maui County, Hawaii (731 ac, 296 ha), and *Partulina variabilis*—Unit 5—Wet Cliff, Maui County, Hawaii (230 ac, 93 ha).

(i) [Reserved for textual description of Unit 4.]. This unit is critical habitat for the Lanai tree snail, *Partulina variabilis*.

(ii) [Reserved for textual description of Unit 5.]. This unit is critical habitat for the Lanai tree snail, *Partulina variabilis*.

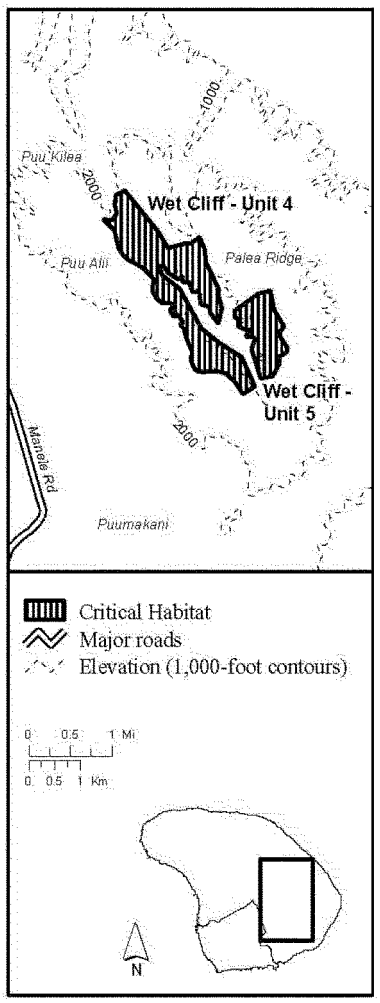
(iii) NOTE: Map of *Partulina variabilis*—Unit 4—Wet Cliff and *Partulina variabilis*—Unit 5—Wet Cliff follows:

Map 4

Partulina variabilis

Wet Cliff

Unit 4 and Unit 5



Newcomb's tree snail (*Newcombia cumingi*)

(1) The critical habitat unit is depicted for Maui County, Hawaii, on the map below.

(2) *Primary constituent elements.* In unit 1, the primary constituent elements of critical habitat for the Newcomb's tree snail are:

(i) Elevation: Less than 3,300 ft (1,000 m).

(ii) Annual precipitation: Greater than 75 in (190 cm).

(iii) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(iv) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(v) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(vi) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

(3) Existing manmade features and structures, such as buildings, roads, railroads, airports, runways, other paved areas, lawns, and other urban landscaped areas, do not contain one or more of the physical or biological features. Federal actions limited to those areas, therefore, would not trigger a consultation under section 7 of the Act unless they may affect the species or physical or biological features in adjacent critical habitat.

(4) *Critical habitat map.* Map was created in GIS, with coordinates in UTM Zone 4, units in meters using North American datum of 1983 (NAD 83).

(5) *Newcombia cumingi*—Unit 1—Lowland Wet, Maui County, Hawaii (599 ac, 243 ha).

(i) [Reserved for textual description of Unit 1.]. This unit is critical habitat for the Newcomb's tree snail, *Newcombia cumingi.*

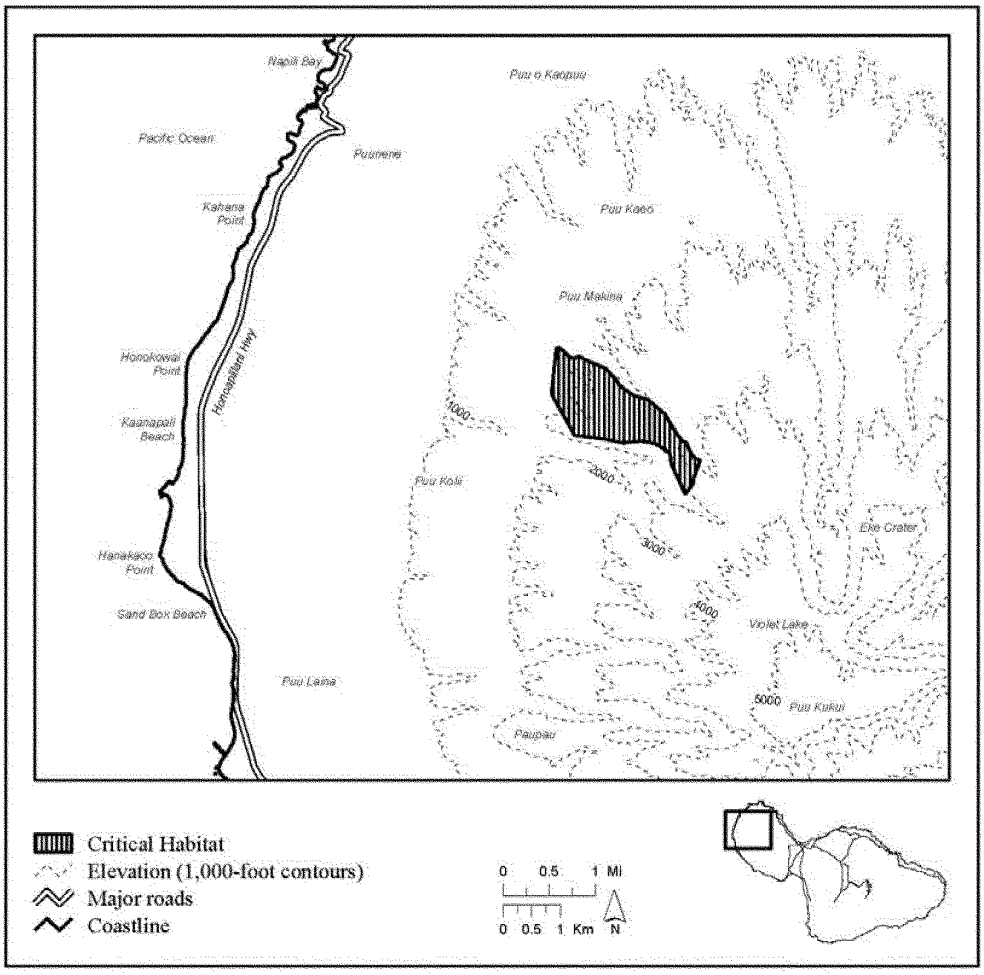
(ii) NOTE: Map of *Newcombia cumingi*—Unit 1—Lowland Wet follows:

Map 1

Newcombia cumingi

Lowland Wet

Unit 1



* * * * *

§ 17.96 [Amended]

5. Amend § 17.96 as follows:

a. In paragraph (a) by removing the entry for ''Family Rhamnaceae: *Gouania hillebrandii;*'' and

b. By removing and reserving paragraph (b).

6. Amend § 17.99 as follows:

a. Revise the section heading to read as set forth below.

b. Amend paragraph (a)(1) by removing the words listed in the

''Remove'' column below and adding in their place the words listed in the ''Add'' column below:

Paragraph designation	Remove	Add
(a)(1)(cxxxiv), the introductory text	Kauai 11—*Centaurium sebaeoides*—a	Kauai 11—*Schenkia sebaeoides*—a.
(a)(1)(clxxi), the introductory text	Kauai 11—*Diellia erecta*—a	Kauai 11—*Asplenium dielerectum*—a.

c. Amend paragraph (a)(1) by removing the maps in paragraphs (a)(1)(cxxxiv)(B) and (a)(1)(clxxi)(B), and adding in their place the maps set forth below.

d. Amend paragraph (a)(1)(cdix), the Table of Protected Species Within Each Critical Habitat Unit for Kauai by removing the words listed in the ''Remove'' column below and adding in their place the words listed in the ''Add'' column below:

Column heading	Remove	Add
Unit name	Kauai 11—*Centaurium sebaeoides*—a	Kauai 11—*Schenkia sebaeoides*—a.
Species occupied	*Centaurium sebaeoides*	*Schenkia sebaeoides*.
Unit name	Kauai 11—*Diellia erecta*—a	Kauai 11—*Asplenium dielerectum*—a.
Species unoccupied	*Diellia erecta*	*Asplenium dielerectum*.

e. Amend paragraph (b)(1) by removing the words listed in the ''Remove'' column below in all places that they appear and adding in their place the words listed in the ''Add'' column below:

Remove	Add
Family Gentianaceae: *Centaurium sebaeoides* (awiwi).	Family Gentianaceae: *Schenkia sebaeoides* (awiwi).
Kauai 11—*Centaurium sebaeoides*—a	Kauai 11—*Schenkia sebaeoides*—a.
Centaurium sebaeoides	*Schenkia sebaeoides*.

f. Amend paragraph (b)(2) by removing the words listed in the ''Remove'' column below in all places that they appear and adding in their place the words listed in the ''Add'' column below:

Remove	Add
Family Aspleniaceae: *Diellia erecta* (no common name)	Family Aspleniaceae: *Asplenium dielerectum* (asplenium-leaved diellia).
Kauai 11—*Diellia erecta*—a	Kauai 11—*Asplenium dielerectum*—a.
Diellia erecta	*Asplenium dielerectum*.

g. Revise paragraphs (c), (d), (e), and (f), to read as set forth below.

h. Amend paragraph (i) by removing the words listed in the ''Remove'' column below and adding in their place the words listed in the ''Add'' column below:

Paragraph designation	Remove	Add
(i)(2), the introductory text	Oahu 1—*Centaurium sebaeoides*—a.	Oahu 1—*Schenkia sebaeoides*—a.
(i)(269), the introductory text	Oahu 27—*Centaurium sebaeoides*—b	Oahu 27—*Schenkia sebaeoides*—a.
(i)(293), the introductory text	Oahu 35—*Diellia erecta*—a	Oahu 35—*Asplenium dielerectum*—a.

i. Amend paragraph (i) by removing the maps in paragraphs (i)(2)(ii), (i)(269)(ii), and (i)(293)(ii), and adding in their place the maps set forth below.

j. Amend paragraph (i)(305), the Table of Protected Species Within Each Critical Habitat Unit for Oahu, by removing the words listed in the ''Remove'' column below in all places that they appear and adding in their place the words listed in the ''Add'' column below:

Column heading	Remove	Add
Unit name	Oahu 1—*Centaurium sebaeoides*—a	Oahu 1—*Schenkia sebaeoides*—a.
Unit name	Oahu 27—*Centaurium sebaeoides*—b	Oahu 27—*Schenkia sebaeoides*—a.
Species unoccupied	*Centaurium sebaeoides*	*Schenkia sebaeoides*.
Unit name	Oahu 35—*Diellia erecta*—a	Oahu 35—*Asplenium dielerectum*—a.
Species occupied	*Diellia erecta*	*Asplenium dielerectum*.

k. Amend paragraph (j)(1) by removing the words listed in the ''Remove'' column below in all places that they appear and adding in their place the words listed in the ''Add'' column below:

Remove	Add
Family Gentianaceae: *Centaurium sebaeoides* (awiwi)	Family Gentianaceae: *Schenkia sebaeoides* (awiwi).
Oahu 1—*Centaurium sebaeoides*—a	Oahu 1—*Schenkia sebaeoides*—a.
Oahu 27—*Centaurium sebaeoides*—b	Oahu 27—*Schenkia sebaeoides*—a.
Centaurium sebaeoides	*Schenkia sebaeoides*.

l. Amend paragraph (j)(2) by removing the words listed in the ''Remove'' column below in all places that they appear and adding in their place the words listed in the ''Add'' column below:

Remove	Add
Family Aspleniaceae: *Diellia erecta* (asplenium-leaved diellia)	Family Aspleniaceae: *Asplenium dielerectum* (asplenium-leaved diellia).
Oahu 35—*Diellia erecta*—a	Oahu 35—*Asplenium dielerectum*—a.
Diellia erecta	*Asplenium dielerectum*.

m. Amend paragraph (k) by removing the words listed in the ''Remove'' column below and adding in their place the words listed in the ''Add'' column below:

Paragraph designation	Remove	Add
(k)(62), the introductory text	Hawaii 17—*Diellia erecta*—a	Hawaii 17—*Asplenium dielerectum*—a.
(k)(65), the introductory text	Hawaii 18—*Diellia erecta*—b	Hawaii 18—*Asplenium dielerectum*—b.
(k)(70), the introductory text	Hawaii 19—*Mariscus fauriei*—a	Hawaii 19—*Cyperus fauriei*—a.
(k)(77), the introductory text	Hawaii 24—*Asplenium fragile* var. *insulare*—a	Hawaii 24—*Asplenium peruvianum* var. *insulare*—a.

n. Amend paragraph (k) by removing the maps in paragraphs (k)(62)(ii), (k)(65)(ii), (k)(70)(ii), and (k)(77)(ii), and adding in their place the maps set forth below.

o. Amend paragraph (k) by revising paragraph (k)(104), the Table of Protected Species Within Each Critical Habitat Unit for the Island of Hawaii, by removing the words listed in the ''Remove'' column below in all places that they appear and adding in their place the words listed in the ''Add'' column below:

Column heading	Remove	Add
Unit name	Hawaii 24—*Asplenium fragile* var. *insulare*—a	Hawaii 24—*Asplenium peruvianum* var. *insulare*—a.
Species occupied	*Asplenium fragile* var. *insulare*	*Asplenium peruvianum* var. *insulare*.
Unit name	Hawaii 17—*Diellia erecta*—a	Hawaii 17—*Asplenium dielerectum*—a.
Unit name	Hawaii 18—*Diellia erecta*—b	Hawaii 18—*Asplenium dielerectum*—b.
Species occupied	*Diellia erecta*	*Asplenium dielerectum*.
Unit name	Hawaii 19—*Mariscus fauriei*—a	Hawaii 19—*Cyperus fauriei*—a.
Species occupied	*Mariscus fauriei*	*Cyperus fauriei*.

p. Amend paragraph (l)(1) by removing the words listed in the ''Remove'' column below in all places that they appear and adding in their place the words listed in the ''Add'' column below:

Remove	Add
Family Cyperaceae: *Mariscus fauriei* (NCN)	Family Cyperaceae: *Cyperus fauriei* (NCN).
Hawaii 19—*Mariscus fauriei*—a	Hawaii 19—*Cyperus fauriei*—a.
Mariscus fauriei	*Cyperus fauriei*.

q. Amend paragraph (l)(2) by removing the words listed in the ''Remove'' column below in all places that they appear and adding in their place the words listed in the ''Add'' column below:

Remove	Add
Family Aspleniaceae: *Asplenium fragile* var. *insulare* (NCN)	Family Aspleniaceae: *Asplenium peruvianum* var. *insulare* (NCN).
Hawaii 24—*Asplenium fragile* var. *insulare*—a,	Hawaii 24—*Asplenium peruvianum* var. *insulare*—a.
Asplenium fragile var. *insulare*	*Asplenium peruvianum* var. *insulare*.
Family Aspleniaceae: *Diellia erecta* (asplenium-leaved diellia)	Family Aspleniaceae: *Asplenium dielerectum* (asplenium-leaved diellia).
Hawaii 17—*Diellia erecta*—a	Hawaii 17—*Asplenium dielerectum*—a.
Hawaii 18—*Diellia erecta*—b	Hawaii 18—*Asplenium dielerectum*—b.

Remove	Add
Diellia erecta	*Asplenium dielerectum.*

r. Add new paragraphs (m) and (n), to read as set forth below.

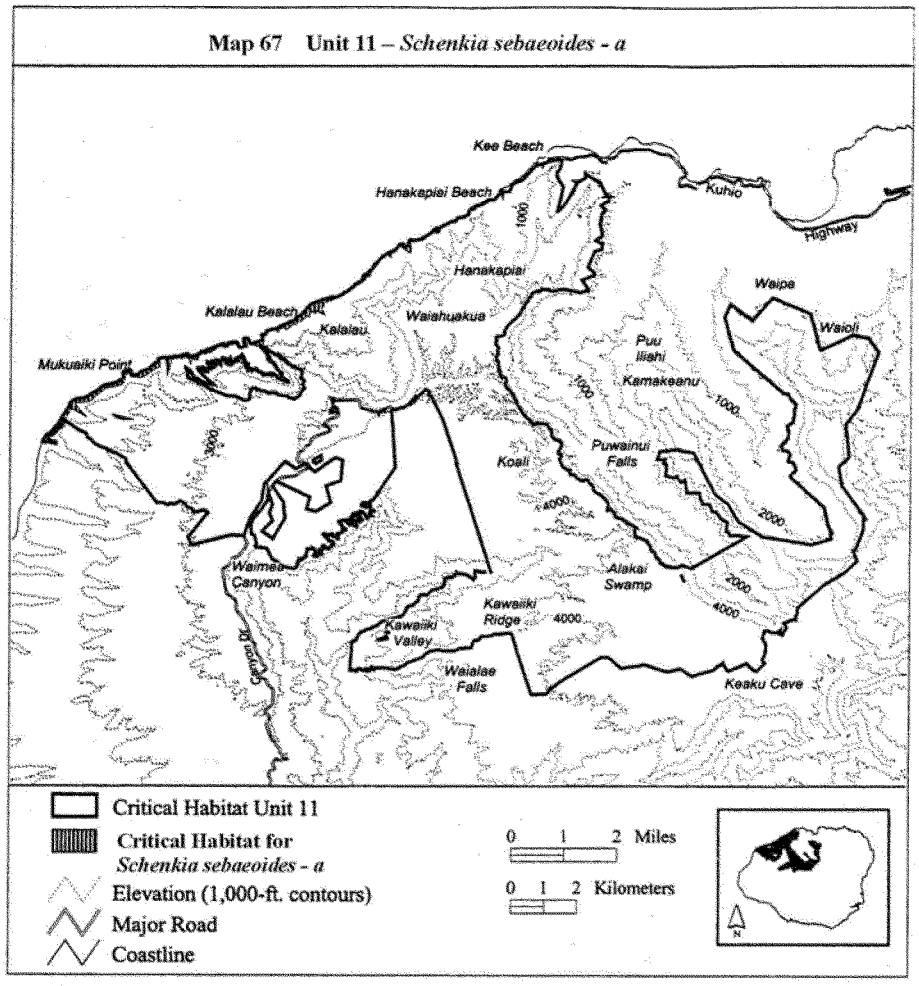
§ 17.99 Critical habitat; plants on the Hawaiian Islands, HI.

(a) * * *

(1) * * *

(cxxxiv) * * *

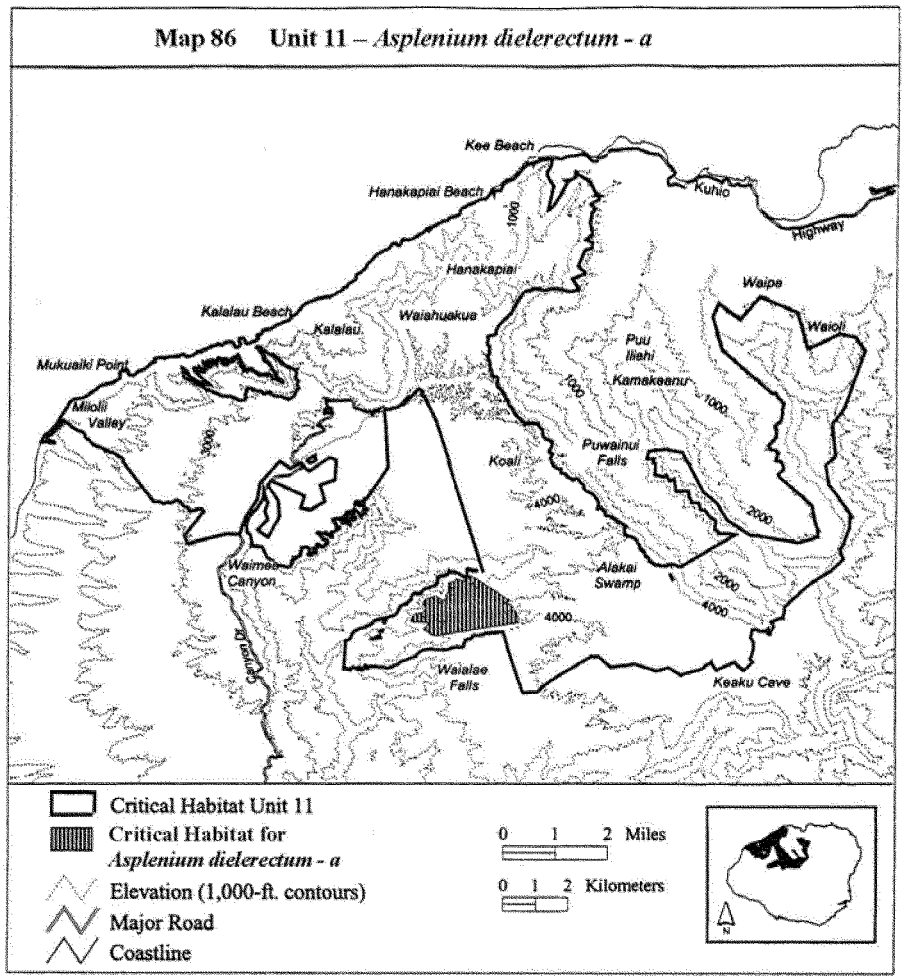
(B) **NOTE:** Map 67 follows:



* * * * *

(clxxi) * * *

(B) Note: Map 86 follows:



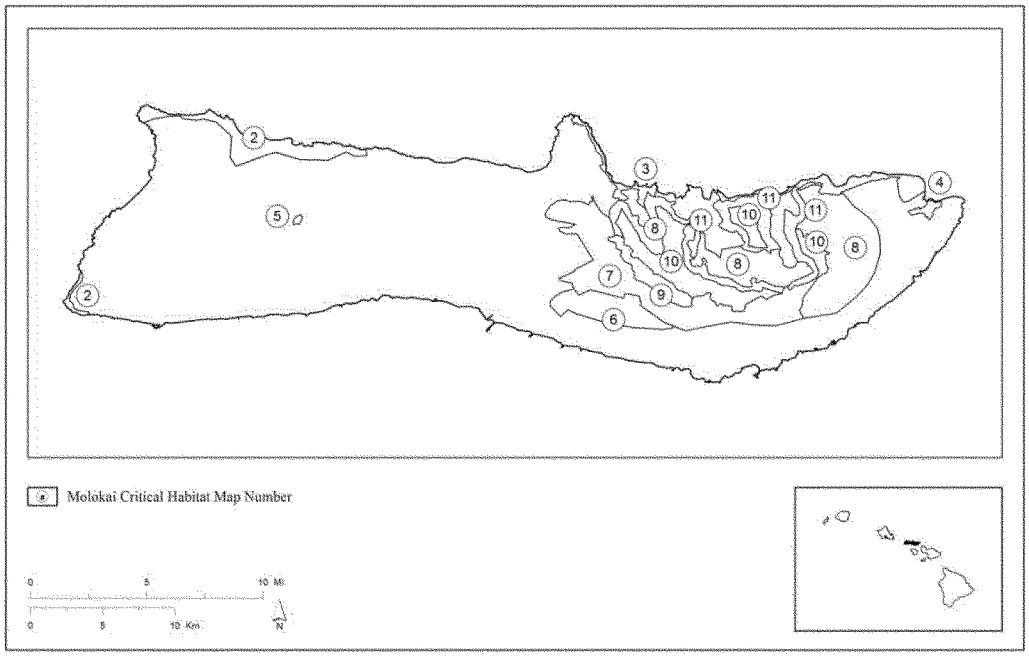
* * * * *

(c) *Maps and critical habitat unit descriptions for the island of Molokai, HI.* Critical habitat units are described below. Coordinates are in UTM Zone 4 with units in meters using North American Datum of 1983 (NAD83). The following map shows the general locations of the critical habitat units designated on the island of Molokai. Existing manmade features and structures, such as buildings, roads, railroads, airports, runways, other paved areas, lawns, and other urban landscaped areas, do not contain one or more of the physical and biological features. Federal actions limited to those areas, therefore, would not trigger a consultation under section 7 of the Act unless they may affect the species or physical or biological features in adjacent critical habitat.

(1) NOTE: Map 1—Index map follows:

Map 1

Molokai Critical Habitat—Island Index Map



(2) Molokai—Coastal—Unit 1 (250 ac, 101 ha) and Molokai—Coastal—Unit 2 (3,544 ac, 1,434 ha)

(i) [Reserved for textual description of Unit 1.] This unit is critical habitat for *Bidens wiebkei, Brighamia rockii, Canavalia molokaiensis, Hibiscus arnottianus* ssp. *immaculatus, Hibiscus brackenridgei, Ischaemum byrone, Marsilea villosa, Peucedanum sandwicense, Pittosporum halophilum, Schenkia sebaeoides, Sesbania tomentosa,* and *Tetramolopium rockii.*

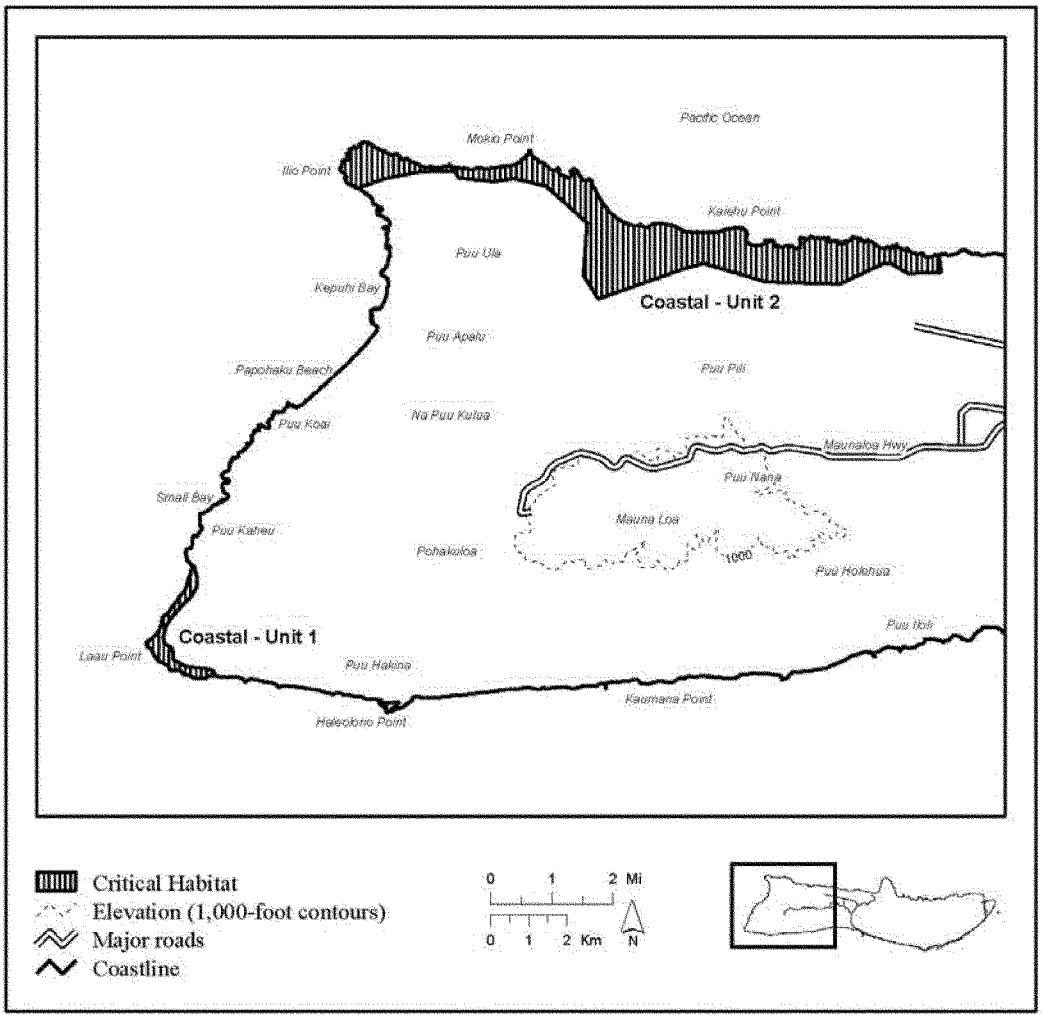
(ii) [Reserved for textual description of Unit 2.] This unit is critical habitat for *Bidens wiebkei, Brighamia rockii, Canavalia molokaiensis, Hibiscus arnottianus* ssp. *immaculatus, Hibiscus brackenridgei, Ischaemum byrone, Marsilea villosa, Peucedanum sandwicense, Pittosporum halophilum, Schenkia sebaeoides, Sesbania tomentosa,* and *Tetramolopium rockii.*

(iii) NOTE: Map of Molokai—Coastal—Unit 1 and Molokai—Coastal—Unit 2 (Map 2) follows:

Map 2

Molokai—Coastal

Unit 1 and Unit 2



(3) Molokai—Coastal—Unit 3 (862 ac, 349 ha), Molokai—Coastal—Unit 4 (10 ac, 4 ha), and Molokai—Coastal—Unit 5 (1 ac, 0.5 ha)

(i) [Reserved for textual description of Unit 3.] This unit is critical habitat for *Bidens wiebkei, Brighamia rockii, Canavalia molokaiensis, Hibiscus arnottianus* ssp. *immaculatus, Hibiscus brackenridgei, Ischaemum byrone, Marsilea villosa, Peucedanum sandwicense, Pittosporum halophilum, Schenkia sebaeoides, Sesbania tomentosa,* and *Tetramolopium rockii.*

(ii) [Reserved for textual description of Unit 4.] This unit is critical habitat for *Bidens wiebkei, Brighamia rockii, Canavalia molokaiensis, Hibiscus arnottianus* ssp. *immaculatus, Hibiscus brackenridgei, Ischaemum byrone, Marsilea villosa, Peucedanum sandwicense, Pittosporum halophilum, Schenkia sebaeoides, Sesbania tomentosa,* and *Tetramolopium rockii.*

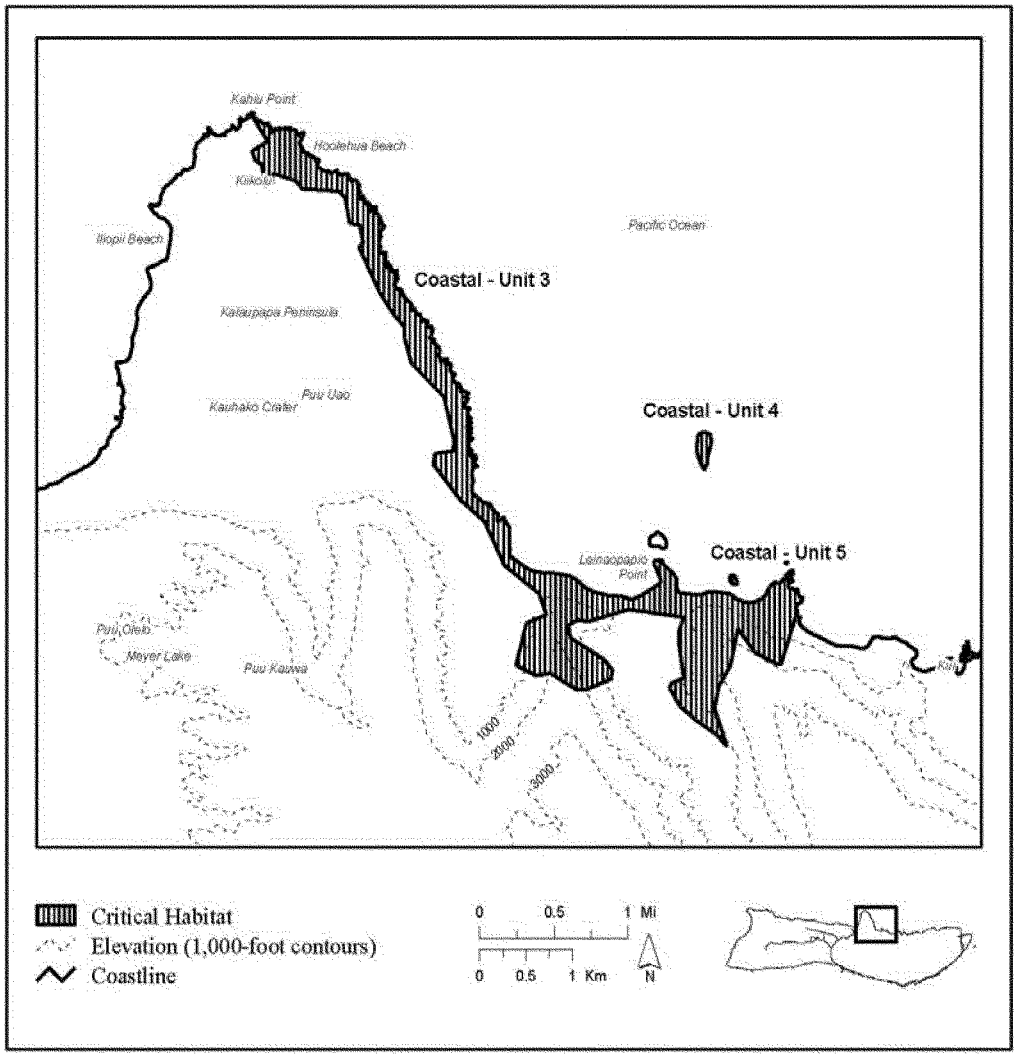
(iii) [Reserved for textual description of Unit 5.] This unit is critical habitat for *Bidens wiebkei, Brighamia rockii, Canavalia molokaiensis, Hibiscus arnottianus* ssp. *immaculatus, Hibiscus brackenridgei, Ischaemum byrone, Marsilea villosa, Peucedanum sandwicense, Pittosporum halophilum, Schenkia sebaeoides, Sesbania tomentosa,* and *Tetramolopium rockii.*

(iv) NOTE: Map of Molokai—Coastal—Unit 3, Molokai—Coastal—Unit 4, and Molokai—Coastal—Unit 5 (Map 3) follows:

Map 3

Molokai—Coastal

Unit 3, Unit 4 and Unit 5



(4) Molokai—Coastal—Unit 6 (1,913 ac, 774 ha) and Molokai—Coastal—Unit 7 (306 ac, 124 ha)

(i) [Reserved for textual description of Unit 6.] This unit is critical habitat for *Bidens wiebkei, Brighamia rockii, Canavalia molokaiensis, Hibiscus arnottianus* ssp. *immaculatus, Hibiscus brackenridgei, Ischaemum byrone, Marsilea villosa, Peucedanum sandwicense, Pittosporum halophilum, Schenkia sebaeoides, Sesbania tomentosa,* and *Tetramolopium rockii.*

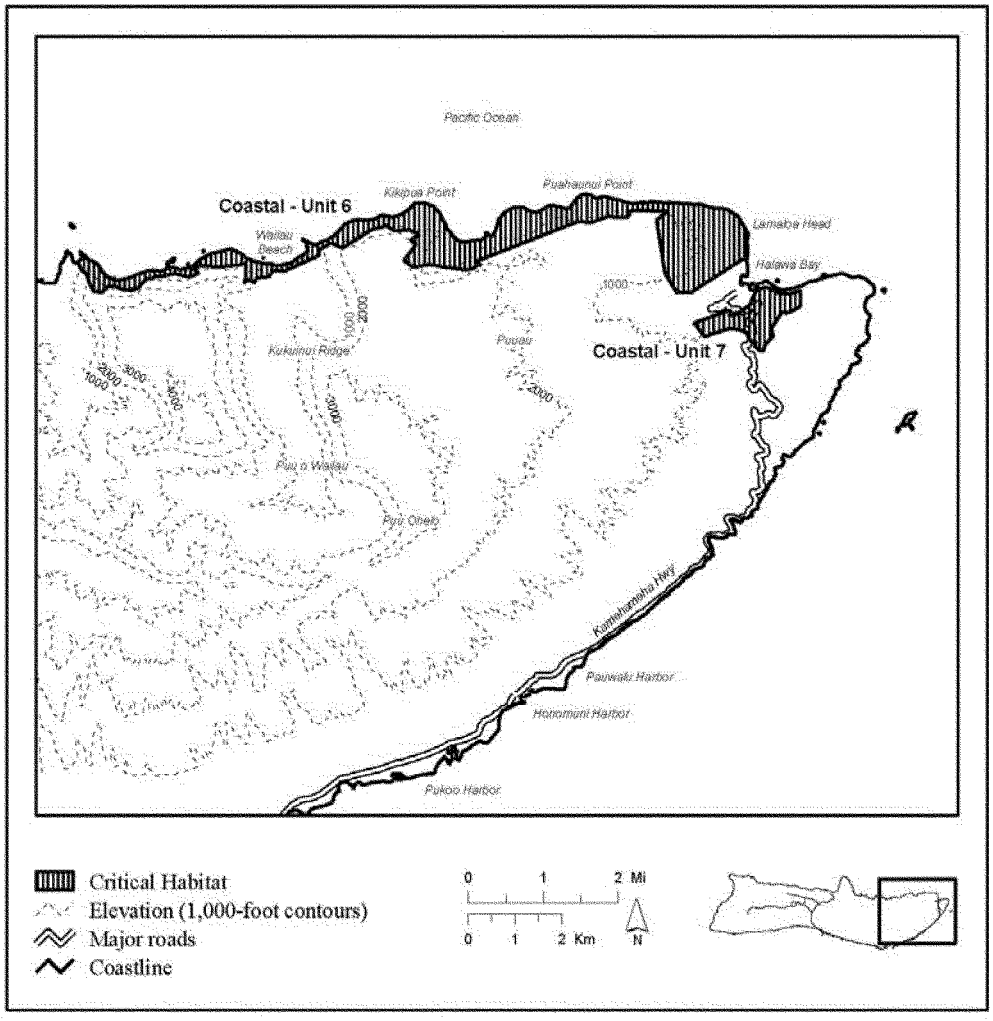
(ii) [Reserved for textual description of Unit 7.] This unit is critical habitat for *Bidens wiebkei, Brighamia rockii, Canavalia molokaiensis, Hibiscus arnottianus* ssp. *immaculatus, Hibiscus brackenridgei, Ischaemum byrone, Marsilea villosa, Peucedanum sandwicense, Pittosporum halophilum, Schenkia sebaeoides, Sesbania tomentosa,* and *Tetramolopium rockii.*

(iii) NOTE: Map of Molokai—Coastal—Unit 6 and Molokai—Coastal—Unit 7 (Map 4) follows:

Map 4

Molokai—Coastal

Unit 6 and Unit 7



(5) Molokai—Lowland Dry—Unit 1 (70 ac, 28 ha).

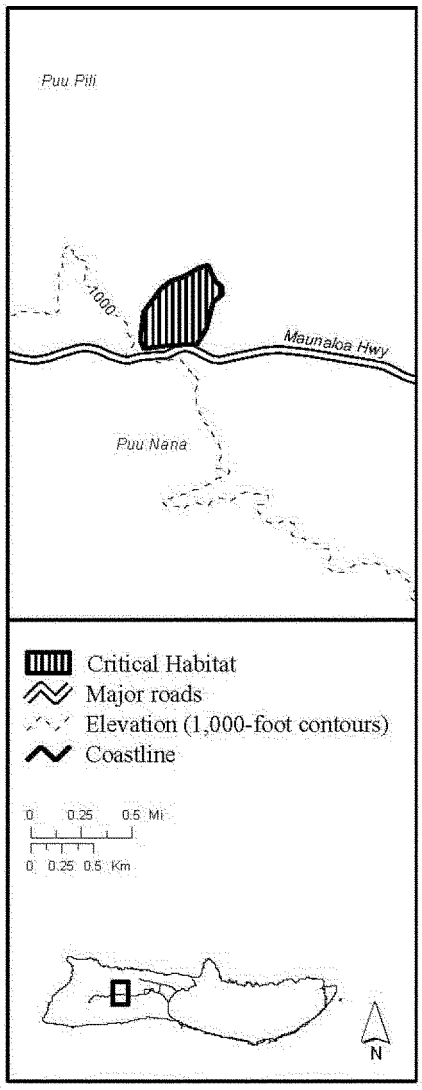
(i) [Reserved for textual description of Unit 1.] This unit is critical habitat for *Bonamia menziesii, Cyperus trachysanthos, Eugenia koolauensis, Hibiscus brackenridgei, Kokia cookei,* and *Sesbania tomentosa.*

(ii) NOTE: Map of Molokai—Lowland Dry—Unit 1 (Map 5) follows:

Map 5

Molokai—Lowland Dry

Unit 1



(6) Molokai—Lowland Dry—Unit 2 (3,201 ac, 1,295 ha).

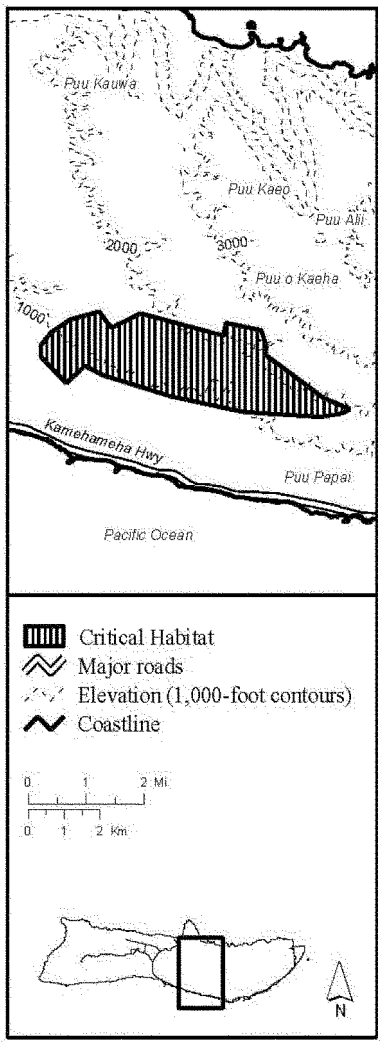
(i) [Reserved for textual description of Unit 2.] This unit is critical habitat for *Bonamia menziesii, Cyperus trachysanthos, Eugenia koolauensis, Hibiscus brackenridgei, Kokia cookei,* and *Sesbania tomentosa.*

(ii) NOTE: Map of Molokai—Lowland Dry—Unit 2 (Map 6) follows:

Map 6

Molokai—Lowland Dry

Unit 2



(7) Molokai—Lowland Mesic—Unit 1 (10,330 ac, 4,180 ha).

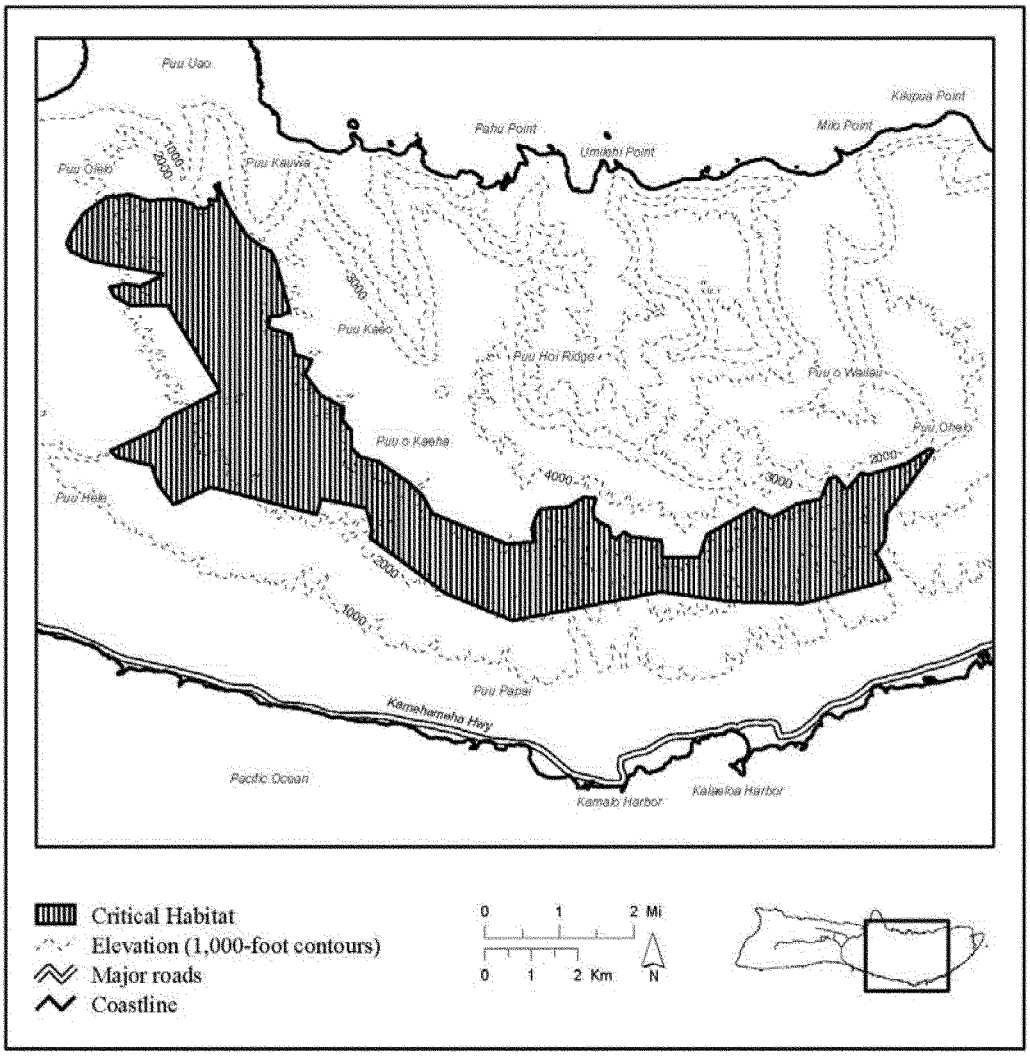
(i) [Reserved for textual description of Unit 1.] This unit is critical habitat for *Alectryon macrococcus, Asplenium dielerectum, Bonamia menziesii, Canavalia molokaiensis, Clermontia oblongifolia* ssp. *brevipes, Ctenitis squamigera, Cyanea dunbariae, Cyanea mannii, Cyanea procera, Cyanea profuga, Cyanea solanacea, Cyperus fauriei, Cyrtandra filipes, Diplazium molokaiense, Festuca molokaiensis, Flueggea neowawraea, Gouania hillebrandii, Isodendrion pyrifolium, Kadua laxiflora, Labordia triflora, Melicope mucronulata, Melicope munroi, Melicope reflexa, Neraudia sericea, Phyllostegia haliakalae, Phyllostegia mannii, Phyllostegia pilosa, Santalum haleakalae* var. *lanaiense, Schiedea lydgatei, Schiedea sarmentosa, Sesbania tomentosa, Silene alexandri, Silene lanceolata, Spermolepis hawaiiensis, Stenogyne bifida, Vigna o-wahuensis,* and *Zanthoxylum hawaiiense.*

(ii) NOTE: Map of Molokai—Lowland Mesic—Unit 1 (Map 7) follows:

Map 7

Molokai—Lowland Mesic

Unit 1



(8) Molokai—Lowland Wet—Unit 1 (3,628 ac, 1,468 ha), Molokai—Lowland Wet—Unit 2 (1,952 ac, 790 ha), and Molokai—Lowland Wet—Unit 3 (8,074 ac, 3,267 ha).

(i) [Reserved for textual description of Unit 1.] This unit is critical habitat for *Asplenium dielerectum, Bidens wiebkei, Canavalia molokaiensis, Clermontia oblongifolia* ssp. *brevipes, Cyanea dunbariae, Cyanea grimesiana* ssp. *grimesiana, Cyanea solanacea, Cyrtandra filipes, Lysimachia maxima, Melicope reflexa, Peucedanum sandwicense, Phyllostegia hispida, Phyllostegia mannii, Plantago princeps, Stenogyne bifida,* and *Zanthoxylum hawaiiense.*

(ii) [Reserved for textual description of Unit 2.] This unit is critical habitat for *Asplenium dielerectum, Bidens wiebkei, Canavalia molokaiensis, Clermontia oblongifolia* ssp. *brevipes, Cyanea dunbariae, Cyanea grimesiana* ssp. *grimesiana, Cyanea solanacea, Cyrtandra filipes, Lysimachia maxima, Melicope reflexa, Peucedanum sandwicense, Phyllostegia hispida, Phyllostegia mannii, Plantago princeps, Stenogyne bifida,* and *Zanthoxylum hawaiiense.*

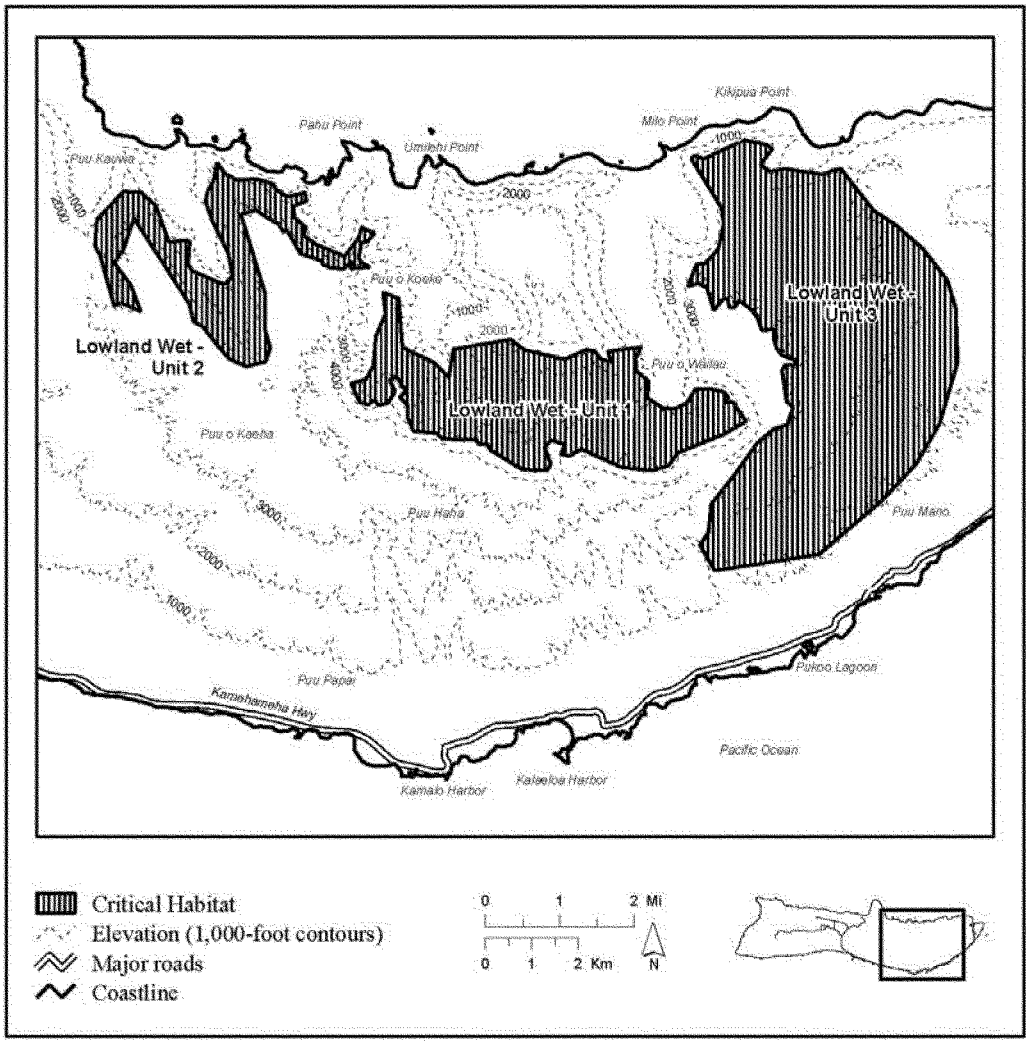
(iii) [Reserved for textual description of Unit 3.] This unit is critical habitat for *Asplenium dielerectum, Bidens wiebkei, Canavalia molokaiensis, Clermontia oblongifolia* ssp. *brevipes, Cyanea dunbariae, Cyanea grimesiana* ssp. *grimesiana, Cyanea solanacea, Cyrtandra filipes, Lysimachia maxima, Melicope reflexa, Peucedanum sandwicense, Phyllostegia hispida, Phyllostegia mannii, Plantago princeps, Stenogyne bifida,* and *Zanthoxylum hawaiiense.*

(iv) NOTE: Map of Molokai—Lowland Wet—Unit 1, Molokai—Lowland Wet—Unit 2, and Molokai—Lowland Wet—Unit 3 (Map 8) follows:

Map 8

Molokai—Lowland Wet

Unit 1, Unit 2 and Unit 3



(9) Molokai—Montane Wet—Unit 1 (4,818 ac, 1,950 ha), Molokai—Montane Wet—Unit 2 (910 ac, 368 ha), and Molokai—Montane Wet—Unit 3 (803 ac, 325 ha).

(i) [Reserved for textual description of Unit 1.] This unit is critical habitat for *Adenophorus periens, Bidens wiebkei, Clermontia oblongifolia* ssp. *brevipes, Cyanea mannii, Cyanea procera, Cyanea profuga, Cyanea solanacea, Hesperomannia arborescens, Lysimachia maxima, Melicope reflexa, Phyllostegia hispida, Phyllostegia mannii, Phyllostegia pilosa, Platanthera holochila, Pteris lidgatei, Schiedea laui, Stenogyne bifida,* and *Zanthoxylum hawaiiense.*

(ii) [Reserved for textual description of Unit 2.] This unit is critical habitat for *Adenophorus periens, Bidens wiebkei, Clermontia oblongifolia* ssp. *brevipes, Cyanea mannii, Cyanea procera, Cyanea profuga, Cyanea solanacea, Hesperomannia arborescens, Lysimachia maxima, Melicope reflexa, Phyllostegia hispida, Phyllostegia mannii, Phyllostegia pilosa, Platanthera holochila, Pteris lidgatei, Schiedea laui, Stenogyne bifida,* and *Zanthoxylum hawaiiense.*

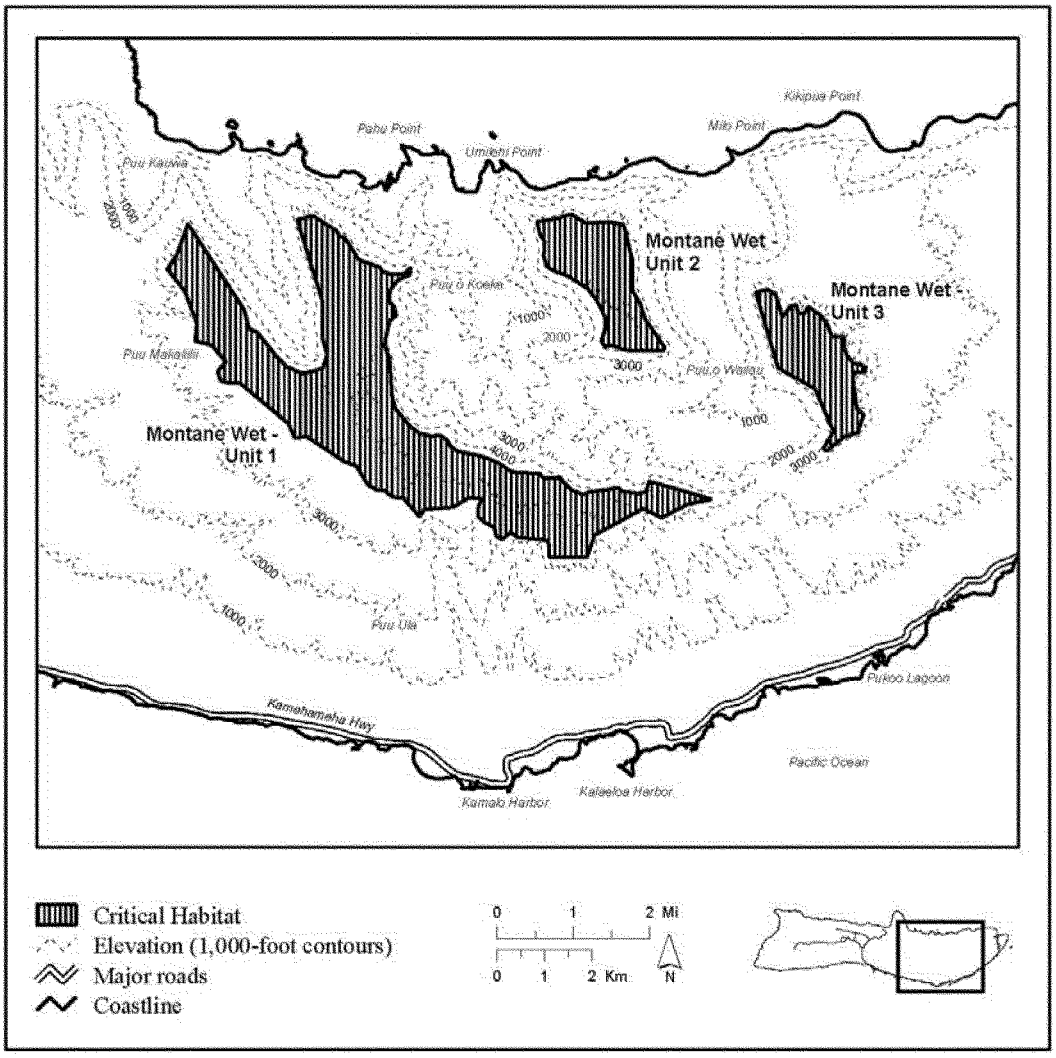
(iii) [Reserved for textual description of Unit 3.] This unit is critical habitat for *Adenophorus periens, Bidens wiebkei, Clermontia oblongifolia* ssp. *brevipes, Cyanea mannii, Cyanea procera, Cyanea profuga, Cyanea solanacea, Hesperomannia arborescens, Lysimachia maxima, Melicope reflexa, Phyllostegia hispida, Phyllostegia mannii, Phyllostegia pilosa, Platanthera holochila, Pteris lidgatei, Schiedea laui, Stenogyne bifida,* and *Zanthoxylum hawaiiense.*

(iv) NOTE: Map of Molokai—Montane Wet—Unit 1, Molokai—Montane Wet—Unit 2, and Molokai—Montane Wet—Unit 3 (Map 9) follows:

Map 9

Molokai—Montane Wet

Unit 1, Unit 2 and Unit 3



(10) Molokai—Montane Mesic—Unit 1 (1,629 ac, 659 ha).

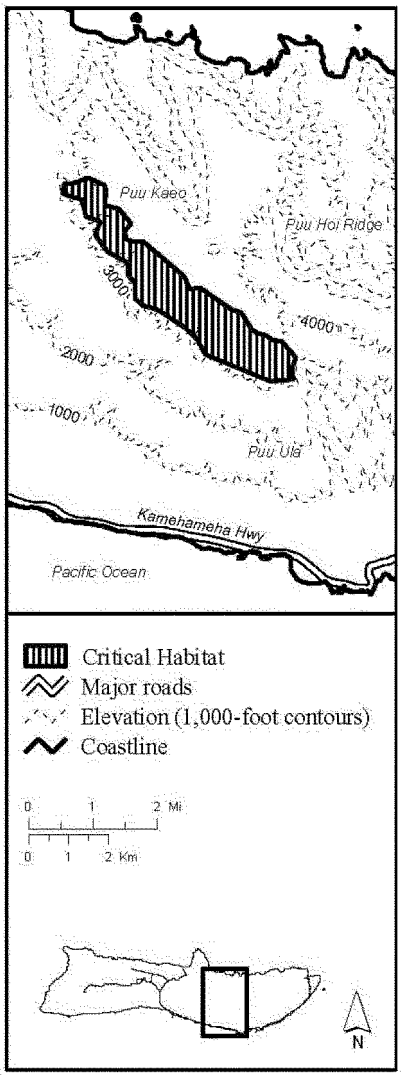
(i) [Reserved for textual description of Unit 1.] This unit is critical habitat for *Alectryon macrococcus, Asplenium dielerectum, Bidens wiebkei, Cyanea dunbariae, Cyanea mannii, Cyanea procera, Cyanea solanacea, Cyperus fauriei, Kadua laxiflora, Melicope mucronulata, Neraudia sericea, Plantago princeps, Santalum haleakalae* var. *lanaiense, Spermolepis hawaiiensis,* and *Stenogyne bifida.*

(ii) NOTE: Map of Molokai—Montane Mesic—Unit 1 (Map 10) follows:

Map 10

Molokai—Montane Mesic

Unit 1



(11) Molokai—Wet Cliff—Unit 1 (1,888 ac, 764 ha), Molokai—Wet Cliff—Unit 2 (1,280 ac, 518 ha), and Molokai—Wet Cliff—Unit 3 (1,362 ac, 551 ha).

(i) [Reserved for textual description of Unit 1.] This unit is critical habitat for *Brighamia rockii, Canavalia molokaiensis, Clermontia oblongifolia* ssp. *brevipes, Cyanea grimesiana* ssp. *grimesiana, Cyanea munroi, Hesperomannia arborescens, Hibiscus arnottianus* ssp. *immaculatus, Phyllostegia hispida, Pteris lydgatei,* and *Stenogyne bifida.*

(ii) [Reserved for textual description of Unit 2.] This unit is critical habitat for *Brighamia rockii, Canavalia molokaiensis, Clermontia oblongifolia* ssp. *brevipes, Cyanea grimesiana* ssp. *grimesiana, Cyanea munroi, Hesperomannia arborescens, Hibiscus arnottianus* ssp. *immaculatus, Phyllostegia hispida, Pteris lydgatei,* and *Stenogyne bifida.*

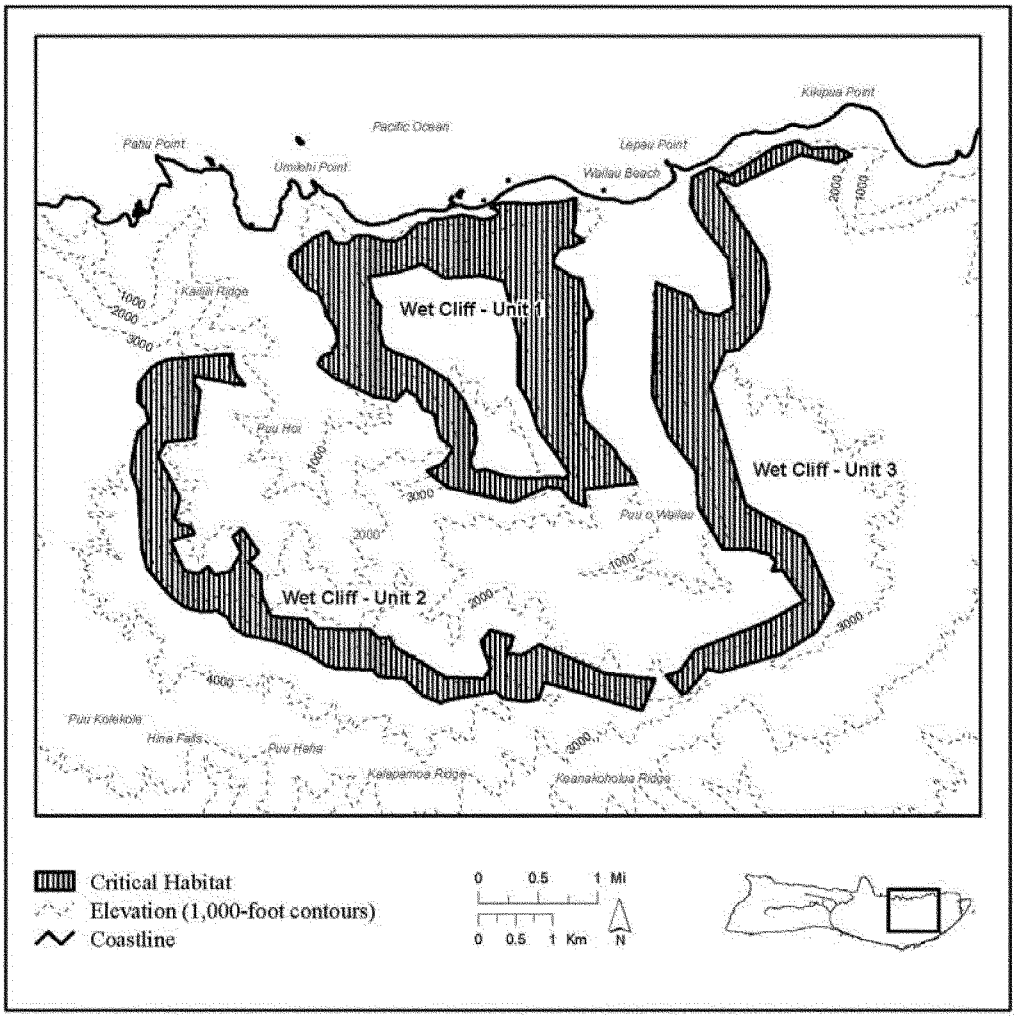
(iii) [Reserved for textual description of Unit 3.] This unit is critical habitat for *Brighamia rockii, Canavalia molokaiensis, Clermontia oblongifolia* ssp. *brevipes, Cyanea grimesiana* ssp. *grimesiana, Cyanea munroi, Hesperomannia arborescens, Hibiscus arnottianus* ssp. *immaculatus, Phyllostegia hispida, Pteris lydgatei,* and *Stenogyne bifida.*

(iv) NOTE: Map of Molokai—Wet Cliff—Unit 1, Molokai—Wet Cliff—Unit 2, and Molokai—Wet Cliff—Unit 3 (Map 11) follows:

Map 11

Molokai—Wet Cliff

Unit 1, Unit 2 and Unit 3



(12) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR MOLOKAI

Unit name	Species occupied	Species unoccupied
Molokai—Coastal—Unit 1		*Bidens wiebkei.*
		Brighamia rockii.
		Canavalia molokaiensis.
		Hibiscus arnottianus ssp. *Immaculatus.*
		Hibiscus brackenridgei.
		Ischaemum byrone.
	Marsilea villosa	*Marsilea villosa.*
		Peucedanum sandwicense.
		Pittosporum halophilum.
		Schenkia sebaeoides.
		Sesbania tomentosa.
		Tetramolopium rockii.
Molokai—Coastal—Unit 2		*Bidens wiebkei.*
		Brighamia rockii.
		Canavalia molokaiensis.
		Hibiscus arnottianus ssp. *Immaculatus.*
		Hibiscus brackenridgei.
		Ischaemum byrone.

(12) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR MOLOKAI—Continued

Unit name	Species occupied	Species unoccupied
	Marsilea villosa	*Marsilea villosa.*
		Peucedanum sandwicense.
		Pittosporum halophilum.
	Schenkia sebaeoides	*Schenkia sebaeoides.*
	Sesbania tomentosa	*Sesbania tomentosa.*
	Tetramolopium rockii	*Tetramolopium rockii.*
Molokai—Coastal—Unit 3		*Bidens wiebkei.*
		Brighamia rockii.
	Canavalia molokaiensis	*Canavalia molokaiensis.*
		Hibiscus arnottianus ssp. *Immaculatus.*
		Hibiscus brackenridgei.
		Ischaemum byrone.
		Marsilea villosa.
		Peucedanum sandwicense.
	Pittosporum halophilum	*Pittosporum halophilum.*
	Schenkia sebaeoides	*Schenkia sebaeoides.*
		Sesbania tomentosa.
	Tetramolopium rockii	*Tetramolopium rockii.*
Molokai—Coastal—Unit 4		*Bidens wiebkei.*
		Brighamia rockii.
		Canavalia molokaiensis.
		Hibiscus arnottianus ssp. *Immaculatus.*
		Hibiscus brackenridgei.
		Ischaemum byrone.
		Marsilea villosa.
	Peucedanum sandwicense	*Peucedanum sandwicense.*
	Pittosporum halophilum	*Pittosporum halophilum.*
		Schenkia sebaeoides.
		Sesbania tomentosa.
		Tetramolopium rockii.
Molokai—Coastal—Unit 5		*Bidens wiebkei.*
	Brighamia rockii	*Brighamia rockii.*
		Canavalia molokaiensis.
		Hibiscus arnottianus ssp. *Immaculatus.*
		Hibiscus brackenridgei.
		Ischaemum byrone.
		Marsilea villosa.
		Peucedanum sandwicense.
	Pittosporum halophilum	*Pittosporum halophilum.*
		Schenkia sebaeoides.
		Sesbania tomentosa.
		Tetramolopium rockii.
Molokai—Coastal—Unit 6	*Bidens wiebkei*	*Bidens wiebkei.*
		Brighamia rockii.
	Canavalia molokaiensis	*Canavalia molokaiensis.*
	Hibiscus arnottianus ssp. *immaculatus*	*Hibiscus arnottianus* ssp. *Immaculatus.*
		Hibiscus brackenridgei.
	Ischaemum byrone	*Ischaemum byrone.*
		Marsilea villosa.
	Peucedanum sandwicense	*Peucedanum sandwicense.*
		Pittosporum halophilum.
		Schenkia sebaeoides.
		Sesbania tomentosa.
		Tetramolopium rockii.
Molokai—Coastal—Unit 7		*Bidens wiebkei.*
		Brighamia rockii.
		Canavalia molokaiensis.
		Hibiscus arnottianus ssp. *Immaculatus.*
		Hibiscus brackenridgei.
		Ischaemum byrone.
		Marsilea villosa.
		Peucedanum sandwicense.
		Pittosporum halophilum.
		Schenkia sebaeoides.
		Sesbania tomentosa.
		Tetramolopium rockii.
Molokai—Lowland Dry—Unit 1		*Bonamia menziesii.*
		Cyperus trachysanthos.
		Eugenia koolauensis.
		Hibiscus brackenridgei.
		Kokia cookie.
		Sesbania tomentosa.

(12) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR MOLOKAI—Continued

Unit name	Species occupied	Species unoccupied
Molokai—Lowland Dry—Unit 2		*Bonamia menziesii.*
		Cyperus trachysanthos.
		Eugenia koolauensis.
		Hibiscus brackenridgei.
		Kokia cookie.
		Sesbania tomentosa.
Molokai—Lowland Mesic—Unit 1	*Alectryon macrococcus*	*Alectryon micrococcus.*
	Asplenium dielerectum	*Asplenium dielerectum.*
		Bonamia menziesii.
	Canavalia molokaiensis	*Canavalia molokaiensis.*
		Clermontia oblongifolia ssp. *Brevipes.*
	Ctenitis squamigera	*Ctenitis squamigera.*
	Cyanea dunbariae	*Cyanea dunbariae.*
	Cyanea mannii	*Cyanea mannii.*
		Cyanea procera.
	Cyanea profuga	*Cyanea profuga.*
		Cyanea solanacea.
	Cyperus fauriei	*Cyperus fauriei.*
	Cyrtandra filipes	*Cyrtandra filipes.*
		Diplazium molokaiense.
	Festuca molokaiensis	*Festuca molokaiensis.*
		Flueggea neowawraea.
	Gouania hillebrandii	*Gouania hillebrandii.*
		Isodendrion pyrifolium.
		Kadua laxiflora.
	Labordia triflora	*Labordia triflora.*
	Melicope mucronulata	*Melicope mucronulata.*
		Melicope munroi.
		Melicope reflexa.
	Neraudia sericea	*Neraudia sericea.*
		Phyllostegia haliakalae.
		Phyllostegia mannii.
		Phyllostegia pilosa.
	Santalum haleakalae var. *lanaiense*	*Santalum haleakalae* var. *lanaiense.*
	Schiedea lydgatei	*Schiedea lydgatei.*
	Schiedea sarmentosa	*Schiedea sarmentosa.*
		Sesbania tomentosa.
	Silene alexandri	*Silene alexandri.*
	Silene lanceolata	*Silene lanceolata.*
	Spermolepis hawaiiensis	*Spermolepis hawaiiensis.*
		Stenogyne bifida.
	Vigna o-wahuensis	*Vigna o-wahuensis.*
	Zanthoxylum hawaiiense	*Zanthoxylum hawaiiense.*
Molokai—Lowland Wet—Unit 1		*Asplenium dielerectum.*
		Bidens wiebkei.
	Canavalia molokaiensis	*Canavalia molokaiensis.*
		Clermontia oblongifolia ssp. *Brevipes.*
		Cyanea dunbariae.
		Cyanea grimesiana ssp. *Grimesiana.*
		Cyanea solanacea.
	Cyrtandra filipes	*Cyrtandra filipes.*
		Lysimachia maxima.
		Melicope reflexa.
		Peucedanum sandwicense.
		Phyllostegia hispida.
		Phyllostegia mannii.
		Plantago princeps.
		Stenogyne bifida.
		Zanthoxylum hawaiiense.
Molokai—Lowland Wet—Unit 2		*Asplenium dielerectum.*
		Bidens wiebkei.
		Canavalia molokaiensis.
		Clermontia oblongifolia ssp. *Brevipes.*
		Cyanea dunbariae.
		Cyanea grimesiana ssp. *Grimesiana.*
		Cyanea solanacea.
		Cyrtandra filipes.
	Lysimachia maxima	*Lysimachia maxima.*
		Melicope reflexa.
		Peucedanum sandwicense.
		Phyllostegia hispida.
		Phyllostegia mannii.

(12) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR MOLOKAI—Continued

Unit name	Species occupied	Species unoccupied
		Plantago princeps.
		Stenogyne bifida.
		Zanthoxylum hawaiiense.
Molokai—Lowland Wet—Unit 3		*Asplenium dielerectum*.
	Bidens wiebkei	*Bidens wiebkei*.
		Canavalia molokaiensis.
		Clermontia oblongifolia ssp. *Brevipes*.
		Cyanea dunbariae.
		Cyanea grimesiana ssp. *Grimesiana*.
		Cyanea solanacea.
	Cyrtandra filipes	*Cyrtandra filipes*.
		Lysimachia maxima.
	Melicope reflexa	*Melicope reflexa*.
		Peucedanum sandwicense.
		Phyllostegia hispida.
		Phyllostegia mannii.
		Plantago princeps.
		Stenogyne bifida.
		Zanthoxylum hawaiiense.
Molokai—Montane Wet—Unit 1	*Adenophorus periens*	*Adenophorus periens*.
	Bidens wiebkei	*Bidens wiebkei*.
	Clermontia oblongifolia ssp. *brevipes*	*Clermontia oblongifolia* ssp. *Brevipes*.
	Cyanea mannii	*Cyanea mannii*.
		Cyanea procera.
	Cyanea profuga	*Cyanea profuga*.
	Cyanea solanacea	*Cyanea solanacea*.
		Hesperomannia arborescens.
	Lysimachia maxima	*Lysimachia maxima*.
		Melicope reflexa.
	Phyllostegia hispida	*Phyllostegia hispida*.
	Phyllostegia mannii	*Phyllostegia mannii*.
		Phyllostegia pilosa.
	Platanthera holochila	*Platanthera holochila*.
	Pteris lidgatei	*Pteris lidgatei*.
	Schiedea laui	*Schiedea laui*.
	Stenogyne bifida	*Stenogyne bifida*.
		Zanthoxylum hawaiiense.
Molokai—Montane Wet—Unit 2		*Adenophorus periens*.
		Bidens wiebkei.
		Clermontia oblongifolia ssp. *Brevipes*.
		Cyanea mannii.
		Cyanea procera.
		Cyanea profuga.
		Cyanea solanacea.
		Hesperomannia arborescens.
		Lysimachia maxima.
		Melicope reflexa.
		Phyllostegia hispida.
		Phyllostegia mannii.
		Phyllostegia pilosa.
		Platanthera holochila.
		Pteris lidgatei.
		Schiedea laui.
		Stenogyne bifida.
		Zanthoxylum hawaiiense.
Molokai—Montane Wet—Unit 3		*Adenophorus periens*.
		Bidens wiebkei.
		Clermontia oblongifolia ssp. *Brevipes*.
		Cyanea mannii.
		Cyanea procera.
		Cyanea profuga.
		Cyanea solanacea.
		Hesperomannia arborescens.
		Lysimachia maxima.
	Melicope reflexa	*Melicope reflexa*.
		Phyllostegia hispida.
		Phyllostegia mannii.
		Phyllostegia pilosa.
		Platanthera holochila.
		Pteris lidgatei.
		Schiedea laui.
		Stenogyne bifida.

(12) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR MOLOKAI—Continued

Unit name	Species occupied	Species unoccupied
		Zanthoxylum hawaiiense.
Molokai—Montane Mesic—Unit 1	*Alectryon macrococcus*	*Alectryon micrococcus.*
		Asplenium dielerectum.
	Bidens wiebkei	*Bidens wiebkei.*
		Cyanea dunbariae.
	Cyanea mannii	*Cyanea mannii.*
	Cyanea procera	*Cyanea procera.*
		Cyanea solanacea.
	Cyperus fauriei	*Cyperus fauriei.*
		Kadua laxiflora.
		Melicope mucronulata.
		Neraudia sericea.
		Plantago princeps.
	Santalum haleakalae var. *lanaiense*	*Santalum haleakalae* var. *lanaiense.*
	Spermolepis hawaiiensis	*Spermolepis hawaiiensis.*
		Stenogyne bifida.
Molokai—Wet Cliff—Unit 1	*Brighamia rockii*	*Brighamia rockii.*
	Canavalia molokaiensis	*Canavalia molokaiensis.*
	Clermontia oblongifolia ssp. *brevipes*	*Clermontia oblongifolia* ssp. *Brevipes.*
		Cyanea grimesiana ssp. *Grimesiana.*
		Cyanea munroi.
	Hesperomannia arborescens	*Hesperomannia arborescens.*
	Hibiscus arnottianus ssp. *immaculatus*	*Hibiscus arnottianus* ssp. *Immaculatus.*
		Phyllostegia hispida.
		Pteris lidgatei.
		Stenogyne bifida.
Molokai—Wet Cliff—Unit 2		*Brighamia rockii.*
		Canavalia molokaiensis.
		Clermontia oblongifolia ssp. *Brevipes.*
		Cyanea grimesiana ssp. *Grimesiana.*
		Cyanea munroi.
		Hesperomannia arborescens.
		Hibiscus arnottianus ssp. *Immaculatus.*
	Phyllostegia hispida	*Phyllostegia hispida.*
		Pteris lidgatei.
		Stenogyne bifida.
Molokai—Wet Cliff—Unit 3		*Brighamia rockii.*
		Canavalia molokaiensis.
		Clermontia oblongifolia ssp. *Brevipes.*
		Cyanea grimesiana ssp. *Grimesiana.*
		Cyanea munroi.
		Hesperomannia arborescens.
		Hibiscus arnottianus ssp. *Immaculatus.*
		Phyllostegia hispida.
		Pteris lidgatei.
		Stenogyne bifida

(d) *Plants on Molokai; Constituent elements.*

(1) *Flowering plants.*

Family Apiaceae

Peucedanum sandwicense (Makou)

Molokai—Coastal—Unit 1, Molokai—Coastal—Unit 2, Molokai—Coastal—Unit 3, Molokai—Coastal—Unit 4, Molokai—Coastal—Unit 5, Molokai—Coastal—Unit 6, Molokai—Coastal—Unit 7, Molokai—Lowland Wet—Unit 1, Molokai—Lowland Wet—Unit 2, and Molokai—Lowland Wet—Unit 3, identified in the legal descriptions in paragraph (c) of this section, constitute critical habitat for *Peucedanum sandwicense* on Molokai.

(i) In units Molokai—Coastal—Unit 1, Molokai—Coastal—Unit 2, Molokai—Coastal—Unit 3, Molokai—Coastal—Unit 4, Molokai—Coastal—Unit 5, Molokai—Coastal—Unit 6, and Molokai—Coastal—Unit 7, the physical and biological features of critical habitat are:

(A) Elevation: Less than 980 ft (300 m).

(B) Annual precipitation: Less than 20 in (50 cm).

(C) Substrate: Well-drained, calcareous, talus slopes; weathered clay soils; ephemeral pools; mudflats.

(D) Canopy: *Hibiscus, Myoporum, Santalum, Scaevola.*

(E) Subcanopy: *Gossypium, Sida, Vitex.*

(F) Understory: *Eragrostis, Jacquemontia, Lyceum, Nama, Sesuvium, Sporobolus, Vigna.*

(ii) In units Molokai—Lowland Wet—Unit 1, Molokai—Lowland Wet—Unit 2, and Molokai—Lowland Wet—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

Spermolepis hawaiiensis (NCN)

Molokai—Lowland Mesic—Unit 1 and Molokai—Montane Mesic—Unit 1, identified in the legal descriptions in paragraph (c) of this section, constitute critical habitat for *Spermolepis hawaiiensis* on Molokai.

(i) In unit Molokai—Lowland Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Shallow soils, little to no herbaceous layer.

(D) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(E) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(F) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

(ii) In unit Molokai—Montane Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Deep ash deposits, thin silty loams.

(D) Canopy: *Acacia, Ilex, Metrosideros, Myrsine, Nestegis, Nothocestrum, Pisonia, Pittosporum, Psychotria, Sophora, Zanthoxylum.*

(E) Subcanopy: *Alyxia, Charpentiera, Coprosma, Dodonaea, Kadua, Labordia, Leptecophylla, Phyllostegia, Vaccinium.*

(F) Understory: Ferns, *Carex, Peperomia.*

Family Asteraceae

Bidens wiebkei (KOOKOOLAU)

Molokai—Coastal—Unit 1, Molokai—Coastal—Unit 2, Molokai—Coastal—Unit 3, Molokai—Coastal—Unit 4, Molokai—Coastal—Unit 5, Molokai—Coastal—Unit 6, Molokai—Coastal—Unit 7, Molokai—Lowland Wet—Unit 1, Molokai—Lowland Wet—Unit 2, Molokai—Lowland Wet—Unit 3, Molokai—Montane Wet—Unit 1, Molokai—Montane Wet—Unit 2, Molokai—Montane Wet—Unit 3, and Molokai—Montane Mesic—Unit 1, identified in the legal descriptions in paragraph (c) of this section, constitute critical habitat for *Bidens wiebkei* on Molokai.

(i) In units Molokai—Coastal—Unit 1, Molokai—Coastal—Unit 2, Molokai—Coastal—Unit 3, Molokai—Coastal—Unit 4, Molokai—Coastal—Unit 5, Molokai—Coastal—Unit 6, and Molokai—Coastal—Unit 7, the physical and biological features of critical habitat are:

(A) Elevation: Less than 980 ft (300 m).

(B) Annual precipitation: Less than 20 in (50 cm).

(C) Substrate: Well-drained, calcareous, talus slopes; weathered clay soils; ephemeral pools; mudflats.

(D) Canopy: *Hibiscus, Myoporum, Santalum, Scaevola.*

(E) Subcanopy: *Gossypium, Sida, Vitex.*

(F) Understory: *Eragrostis, Jacquemontia, Lyceum, Nama, Sesuvium, Sporobolus, Vigna.*

(ii) In units Molokai—Lowland Wet—Unit 1, Molokai—Lowland Wet—Unit 2, and Molokai—Lowland Wet—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

(iii) In units Molokai—Montane Wet—Unit 1, Molokai—Montane Wet—Unit 2, and Molokai—Montane Wet—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Well-developed soils, montane bogs.

(D) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(E) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(F) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

(iv) In unit Molokai—Montane Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Deep ash deposits, thin silty loams.

(D) Canopy: *Acacia, Ilex, Metrosideros, Myrsine, Nestegis, Nothocestrum, Pisonia, Pittosporum, Psychotria, Sophora, Zanthoxylum.*

(E) Subcanopy: *Alyxia, Charpentiera, Coprosma, Dodonaea, Kadua, Labordia, Leptecophylla, Phyllostegia, Vaccinium.*

(F) Understory: Ferns, *Carex, Peperomia.*

Hesperomannia arborescens (NCN)

Molokai—Montane Wet—Unit 1, Molokai—Montane Wet—Unit 2, Molokai—Montane Wet—Unit 3, Molokai—Wet Cliff—Unit 1, Molokai—Wet Cliff—Unit 2, and Molokai—Wet Cliff—Unit 3, identified in the legal descriptions in paragraph (c) of this section, constitute critical habitat for *Hesperomannia arborescens* on Molokai.

(i) In units Molokai—Montane Wet—Unit 1, Molokai—Montane Wet—Unit 2, and Molokai—Montane Wet—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Well-developed soils, montane bogs.

(D) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(E) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(F) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

(ii) In units Molokai—Wet Cliff—Unit 1, Molokai—Wet Cliff—Unit 2, and Molokai—Wet Cliff—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.

(D) Canopy: None.

(E) Subcanopy: *Broussaisia, Cheirodendron, Leptocophylla, Metrosideros.*

(F) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Tetramolopium rockii (NCN)

Molokai—Coastal—Unit 1, Molokai—Coastal—Unit 2, Molokai—Coastal—Unit 3, Molokai—Coastal—Unit 4, Molokai—Coastal—Unit 5, Molokai—Coastal—Unit 6, and Molokai—Coastal—Unit 7, identified in the legal descriptions in paragraph (c) of this section, constitute critical habitat for *Tetramolopium rockii* on Molokai. In units Molokai—Coastal—Unit 1, Molokai—Coastal—Unit 2, Molokai—Coastal—Unit 3, Molokai—Coastal—Unit 4, Molokai—Coastal—Unit 5, Molokai—Coastal—Unit 6, and Molokai—Coastal—Unit 7, the physical and biological features of critical habitat are:

(i) Elevation: Less than 980 ft (300 m).

(ii) Annual precipitation: Less than 20 in (50 cm).

(iii) Substrate: Well-drained, calcareous, talus slopes; weathered clay soils; ephemeral pools; mudflats.

(iv) Canopy: *Hibiscus, Myoporum, Santalum, Scaevola.*

(v) Subcanopy: *Gossypium, Sida, Vitex.*

(vi) Understory: *Eragrostis, Jacquemontia, Lyceum, Nama, Sesuvium, Sporobolus, Vigna.*

Family Campanulaceae

Brighamia rockii (PAU ALA)

Molokai—Coastal—Unit 1, Molokai—Coastal—Unit 2, Molokai—Coastal—Unit 3, Molokai—Coastal—Unit 4, Molokai—Coastal—Unit 5, Molokai—Coastal—Unit 6, Molokai—Coastal—Unit 7, Molokai—Wet Cliff—Unit 1, Molokai—Wet Cliff—Unit 2, and Molokai—Wet Cliff—Unit 3, identified in the legal descriptions in paragraph (c) of this section, constitute critical habitat for *Brighamia rockii* on Molokai.

(i) In units Molokai—Coastal—Unit 1, Molokai—Coastal—Unit 2, Molokai—Coastal—Unit 3, Molokai—Coastal—Unit 4, Molokai—Coastal—Unit 5, Molokai—Coastal—Unit 6, and Molokai—Coastal—Unit 7, the physical and biological features of critical habitat are:

(A) Elevation: Less than 980 ft (300 m).

(B) Annual precipitation: Less than 20 in (50 cm).

(C) Substrate: Well-drained, calcareous, talus slopes; weathered clay soils; ephemeral pools; mudflats.

(D) Canopy: *Hibiscus, Myoporum, Santalum, Scaevola.*

(E) Subcanopy: *Gossypium, Sida, Vitex.*

(F) Understory: *Eragrostis, Jacquemontia, Lyceum, Nama, Sesuvium, Sporobolus, Vigna.*

(ii) In units Molokai—Wet Cliff—Unit 1, Molokai—Wet Cliff—Unit 2, and Molokai—Wet Cliff—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.

(D) Canopy: None.

(E) Subcanopy: *Broussaisia, Cheirodendron, Leptocophylla, Metrosideros.*

(F) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Clermontia oblongifolia ssp. *brevipes* (OHA WAI)

Molokai—Lowland Mesic—Unit 1, Molokai—Lowland Wet—Unit 1, Molokai—Lowland Wet—Unit 2, Molokai—Lowland Wet—Unit 3, Molokai—Montane Wet—Unit 1, Molokai—Montane Wet—Unit 2, Molokai—Montane Wet—Unit 3, Molokai—Wet Cliff—Unit 1, Molokai—Wet Cliff—Unit 2, and Molokai—Wet Cliff—Unit 3, identified in the legal descriptions in paragraph (c) of this section, constitute critical habitat for *Clermontia oblongifolia* ssp. *brevipes* on Molokai.

(i) In unit Molokai—Lowland Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Shallow soils, little to no herbaceous layer.

(D) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(E) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(F) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

(ii) In units Molokai—Lowland Wet—Unit 1, Molokai—Lowland Wet—Unit 2, and Molokai—Lowland Wet—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

(iii) In units Molokai—Montane Wet—Unit 1, Molokai—Montane Wet—Unit 2, and Molokai—Montane Wet—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Well-developed soils, montane bogs.

(D) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(E) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(F) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

(iv) In units Molokai—Wet Cliff—Unit 1, Molokai—Wet Cliff—Unit 2, and Molokai—Wet Cliff—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.

(D) Canopy: None.

(E) Subcanopy: *Broussaisia, Cheirodendron, Leptocophylla, Metrosideros.*

(F) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Cyanea dunbariae (HAHA)

Molokai—Lowland Mesic—Unit 1, Molokai—Lowland Wet—Unit 1, Molokai—Lowland Wet—Unit 2, Molokai—Lowland Wet—Unit 3, and Molokai—Montane Mesic—Unit 1, identified in the legal descriptions in paragraph (c) of this section, constitute critical habitat for *Cyanea dunbariae* on Molokai.

(i) In unit Molokai—Lowland Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: 50 to 75 in (127 to 190 cm).

(C) Substrate: Shallow soils, little to no herbaceous layer.

(D) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(E) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(F) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

(ii) In units Molokai—Lowland Wet—Unit 1, Molokai—Lowland Wet—Unit 2, and Molokai—Lowland Wet—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

(iii) In unit Molokai—Montane Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Deep ash deposits, thin silty loams.

(D) Canopy: *Acacia, Ilex, Metrosideros, Myrsine, Nestegis,*

Nothocestrum, Pisonia, Pittosporum, Psychotria, Sophora, Zanthoxylum.

(E) Subcanopy: *Alyxia, Charpentiera, Coprosma, Dodonaea, Kadua, Labordia, Leptecophylla, Phyllostegia, Vaccinium.*

(F) Understory: Ferns, *Carex, Peperomia.*

Cyanea grimesiana ssp. *grimesiana* (HAHA)

Molokai—Lowland Wet—Unit 1, Molokai—Lowland Wet—Unit 2, Molokai—Lowland Wet—Unit 3, Molokai—Wet Cliff—Unit 1, Molokai—Wet Cliff—Unit 2, and Molokai—Wet Cliff—Unit 3, identified in the legal descriptions in paragraph (c) of this section, constitute critical habitat for *Cyanea grimesiana* ssp. *grimesiana* on Molokai.

(i) In units Molokai—Lowland Wet—Unit 1, Molokai—Lowland Wet—Unit 2, and Molokai—Lowland Wet—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

(ii) In units Molokai—Wet Cliff—Unit 1, Molokai—Wet Cliff—Unit 2, and Molokai—Wet Cliff—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.

(D) Canopy: None.

(E) Subcanopy: *Broussaisia, Cheirodendron, Leptocophylla, Metrosideros.*

(F) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Cyanea mannii (HAHA)

Molokai—Lowland Mesic—Unit 1, Molokai—Montane Wet—Unit 1, Molokai—Montane Wet—Unit 2, Molokai—Montane Wet—Unit 3, and Molokai—Montane Mesic—Unit 1, identified in the legal descriptions in paragraph (c) of this section, constitute critical habitat for *Cyanea mannii* on Molokai.

(i) In unit Molokai—Lowland Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Shallow soils, little to no herbaceous layer.

(D) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(E) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(F) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

(ii) In units Molokai—Montane Wet—Unit 1, Molokai—Montane Wet—Unit 2, and Molokai—Montane Wet—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Well-developed soils, montane bogs.

(D) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(E) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(F) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

(iii) In unit Molokai—Montane Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Deep ash deposits, thin silty loams.

(D) Canopy: *Acacia, Ilex, Metrosideros, Myrsine, Nestegis, Nothocestrum, Pisonia, Pittosporum, Psychotria, Sophora, Zanthoxylum.*

(E) Subcanopy: *Alyxia, Charpentiera, Coprosma, Dodonaea, Kadua, Labordia, Leptecophylla, Phyllostegia, Vaccinium.*

(F) Understory: Ferns, *Carex, Peperomia.*

Cyanea munroi (HAHA)

Molokai—Wet Cliff—Unit 1, Molokai—Wet Cliff—Unit 2, and Molokai—Wet Cliff—Unit 3, identified in the legal descriptions in paragraph (c) of this section, constitute critical habitat for *Cyanea munroi* on Molokai. In units Molokai—Wet Cliff—Unit 1, Molokai—Wet Cliff—Unit 2, and Molokai—Wet Cliff—Unit 3, the physical and biological features of critical habitat are:

(i) Elevation: Unrestricted.

(ii) Annual precipitation: Greater than 75 in (190 cm).

(iii) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.

(iv) Canopy: None.

(v) Subcanopy: *Broussaisia, Cheirodendron, Leptocophylla, Metrosideros.* (vi) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Cyanea procera (HAHA)

Molokai—Lowland Mesic—Unit 1, Molokai—Montane Wet—Unit 1, Molokai—Montane Wet—Unit 2, Molokai—Montane Wet—Unit 3, and Molokai—Montane Mesic—Unit 1, identified in the legal descriptions in paragraph (c) of this section, constitute critical habitat for *Cyanea procera* on Molokai.

(i) In unit Molokai—Lowland Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Shallow soils, little to no herbaceous layer.

(D) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(E) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(F) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

(ii) In units Molokai—Montane Wet—Unit 1, Molokai—Montane Wet—Unit 2, and Molokai—Montane Wet—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Well-developed soils, montane bogs.

(D) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(E) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(F) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

(iii) In unit Molokai—Montane Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Deep ash deposits, thin silty loams.

(D) Canopy: *Acacia, Ilex, Metrosideros, Myrsine, Nestegis, Nothocestrum, Pisonia, Pittosporum, Psychotria, Sophora, Zanthoxylum.*

(E) Subcanopy: *Alyxia, Charpentiera, Coprosma, Dodonaea, Kadua, Labordia, Leptecophylla, Phyllostegia, Vaccinium.*

(F) Understory: Fern, *Carex, Peperomia.*

Cyanea profuga (HAHA)

Molokai—Lowland Mesic—Unit 1, Molokai—Montane Wet—Unit 1, Molokai—Montane Wet—Unit 2, and Molokai—Montane Wet—Unit 3, identified in the legal descriptions in paragraph (c) of this section, constitute critical habitat for *Cyanea profuga* on Molokai.

(i) In unit Molokai—Lowland Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Shallow soils, little to no herbaceous layer.

(D) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(E) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(F) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

(ii) In units Molokai—Montane Wet—Unit 1, Molokai—Montane Wet—Unit 2, and Molokai—Montane Wet—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Well-developed soils, montane bogs.

(D) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(E) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(F) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

Cyanea solanacea (POPOLO, HAHA NUI)

Molokai—Lowland Mesic—Unit 1, Molokai—Lowland Wet—Unit 1, Molokai—Lowland Wet—Unit 2, Molokai—Lowland Wet—Unit 3, Molokai—Montane Wet—Unit 1, Molokai—Montane Wet—Unit 2, Molokai—Montane Wet—Unit 3, and Molokai—Montane Mesic—Unit 1, identified in the legal descriptions in paragraph (c) of this section, constitute critical habitat for *Cyanea solanacea* on Molokai.

(i) In unit Molokai—Lowland Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Shallow soils, little to no herbaceous layer.

(D) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(E) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(F) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

(ii) In units Molokai—Lowland Wet—Unit 1, Molokai—Lowland Wet—Unit 2, and Molokai—Lowland Wet—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

(iii) In units Molokai—Montane Wet—Unit 1, Molokai—Montane Wet—Unit 2, and Molokai—Montane Wet—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Well-developed soils, montane bogs.

(D) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(E) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(F) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

(iv) In unit Molokai—Montane Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Deep ash deposits, thin silty loams.

(D) Canopy: *Acacia, Ilex, Metrosideros, Myrsine, Nestegis, Nothocestrum, Pisonia, Pittosporum, Psychotria, Sophora, Zanthoxylum.*

(E) Subcanopy: *Alyxia, Charpentiera, Coprosma, Dodonaea, Kadua, Labordia, Leptecophylla, Phyllostegia, Vaccinium.*

(F) Understory: Ferns, *Carex, Peperomia.*

Family Caryophyllaceae

Schiedea laui (NCN)

Molokai—Montane Wet—Unit 1, Molokai—Montane Wet—Unit 2, and Molokai—Montane Wet—Unit 3, identified in the legal descriptions in paragraph (c) of this section, constitute critical habitat for *Schiedea laui* on Molokai. In units Molokai—Montane Wet—Unit 1, Molokai—Montane Wet—Unit 2, and Molokai—Montane Wet—Unit 3, the physical and biological features of critical habitat are:

(i) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(ii) Annual precipitation: Greater than 75 in (190 cm).

(iii) Substrate: Well-developed soils, montane bogs.

(iv) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(v) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(vi) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

Schiedea lydgatei (NCN)

Molokai—Lowland Mesic—Unit 1, identified in the legal descriptions in paragraph (c) of this section, constitutes critical habitat for *Schiedea lydgatei* on Molokai. In unit Molokai—Lowland Mesic—Unit 1, the physical and biological features of critical habitat are:

(i) Elevation: Less than 3,300 ft (1,000 m).

(ii) Annual precipitation: 50 to 75 in (130 to 190 cm).

(iii) Substrate: Shallow soils, little to no herbaceous layer.

(iv) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(v) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(vi) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

Schiedea sarmentosa (NCN)

Molokai—Lowland Mesic—Unit 1, identified in the legal descriptions in paragraph (c) of this section, constitutes critical habitat for *Schiedea sarmentosa* on Molokai. In unit Molokai—Lowland Mesic—Unit 1, the physical and biological features of critical habitat are:

(i) Elevation: Less than 3,300 ft (1,000 m).

(ii) Annual precipitation: 50 to 75 in (130 to 190 cm).

(iii) Substrate: Shallow soils, little to no herbaceous layer.

(iv) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(v) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(vi) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

Silene alexandri (NCN)

Molokai—Lowland Mesic—Unit 1, identified in the legal descriptions in paragraph (c) of this section, constitutes

critical habitat for *Silene alexandri* on Molokai. In unit Molokai—Lowland Mesic—Unit 1, the physical and biological features of critical habitat are:

(i) Elevation: Less than 3,300 ft (1,000 m).

(ii) Annual precipitation: 50 to 75 in (130 to 190 cm).

(iii) Substrate: Shallow soils, little to no herbaceous layer.

(iv) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(v) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(vi) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

Silene lanceolata (NCN)

Molokai—Lowland Mesic—Unit 1, identified in the legal descriptions in paragraph (c) of this section, constitutes critical habitat for *Silene lanceolata* on Molokai. In unit Molokai—Lowland Mesic—Unit 1, the physical and biological features of critical habitat are:

(i) Elevation: Less than 3,300 ft (1,000 m).

(ii) Annual precipitation: 50 to 75 in (130 to 190 cm).

(iii) Substrate: Shallow soils, little to no herbaceous layer.

(iv) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(v) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(vi) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

Family Convolvulaceae

Bonamia menziesii (NCN)

Molokai—Lowland Dry—Unit 1, Molokai—Lowland Dry—Unit 2, and Molokai—Lowland Mesic—Unit 1, identified in the legal descriptions in paragraph (c) of this section, constitute critical habitat for *Bonamia menziesii* on Molokai.

(i) In units Molokai—Lowland Dry—Unit 1 and Molokai—Lowland Dry—Unit 2, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Less than 50 in (130 cm).

(C) Substrate: Weathered silty loams to stony clay, rocky ledges, little-weathered lava.

(D) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus.*

(E) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia.*

(F) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Sicyos.*

(ii) In unit Molokai—Lowland Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Shallow soils, little to no herbaceous layer.

(D) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(E) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(F) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

Family Cyperaceae

Cyperus fauriei (NCN)

Molokai—Lowland Mesic—Unit 1 and Molokai—Montane Mesic—Unit 1, identified in the legal descriptions in paragraph (c) of this section, constitute critical habitat for *Cyperus fauriei* on Molokai.

(i) In unit Molokai—Lowland Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Shallow soils, little to no herbaceous layer.

(D) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(E) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(F) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

(ii) In unit Molokai—Montane Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Deep ash deposits, thin silty loams.

(D) Canopy: *Acacia, Ilex, Metrosideros, Myrsine, Nestegis, Nothocestrum, Pisonia, Pittosporum, Psychotria, Sophora, Zanthoxylum.*

(E) Subcanopy: *Alyxia, Charpentiera, Coprosma, Dodonaea, Kadua, Labordia, Leptecophylla, Phyllostegia, Vaccinium.*

(F) Understory: Ferns, *Carex, Peperomia.*

Cyperus trachysanthos (PUUKAA)

Molokai—Lowland Dry—Unit 1 and Molokai—Lowland Dry—Unit 2, identified in the legal descriptions in paragraph (c) of this section, constitute critical habitat for *Cyperus trachysanthos* on Molokai. In units Molokai—Lowland Dry—Unit 1 and Molokai—Lowland Dry—Unit 2, the physical and biological features of critical habitat are:

(i) Elevation: Less than 3,300 ft (1,000 m).

(ii) Annual precipitation: Less than 50 in (130 cm).

(iii) Substrate: Weathered silty loams to stony clay, rocky ledges, little-weathered lava.

(iv) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus.*

(v) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia.*

(vi) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Sicyos.*

Family Euphorbiaceae

Flueggea neowawraea (MEHAMEHAME)

Molokai—Lowland Mesic—Unit 1, identified in the legal descriptions in paragraph (e)(1) of this section, constitutes critical habitat for *Flueggea neowawraea* on Molokai. In unit Molokai—Lowland Mesic—Unit 1, the physical and biological features of critical habitat are:

(i) Elevation: Less than 3,300 ft (1,000 m).

(ii) Annual precipitation: 50 to 75 in (130 to 190 cm).

(iii) Substrate: Shallow soils, little to no herbaceous layer.

(iv) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(v) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(vi) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

Family Fabaceae

Canavalia molokaiensis (AWIKIWIKI)

Molokai—Coastal—Unit 1, Molokai—Coastal—Unit 2, Molokai—Coastal—Unit 3, Molokai—Coastal—Unit 4, Molokai—Coastal—Unit 5, Molokai—Coastal—Unit 6, Molokai—Coastal—Unit 7, Molokai—Lowland Mesic—Unit 1, Molokai—Lowland Wet—Unit 1, Molokai—Lowland Wet—Unit 2, Molokai—Lowland Wet—Unit 3, Molokai—Wet Cliff—Unit 1, Molokai—Wet Cliff—Unit 2, and Molokai—Wet Cliff—Unit 3, identified in the legal descriptions in paragraph (c) of this section, constitute critical habitat for *Canavalia molokaiensis* on Molokai.

(i) In units Molokai—Coastal—Unit 1, Molokai—Coastal—Unit 2, Molokai—Coastal—Unit 3, Molokai—Coastal—Unit 4, Molokai—Coastal—Unit 5, Molokai—Coastal—Unit 6, and

Molokai—Coastal—Unit 7, the physical and biological features of critical habitat are:

(A) Elevation: Less than 980 ft (300 m).

(B) Annual precipitation: Less than 20 in (50 cm).

(C) Substrate: Well-drained, calcareous, talus slopes; weathered clay soils; ephemeral pools; mudflats.

(D) Canopy: *Hibiscus, Myoporum, Santalum, Scaevola.*

(E) Subcanopy: *Gossypium, Sida, Vitex.*

(F) Understory: *Eragrostis, Jacquemontia, Lyceum, Nama, Sesuvium, Sporobolus, Vigna.*

(ii) In unit Molokai—Lowland Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Shallow soils, little to no herbaceous layer.

(D) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(E) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(F) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

(iii) In units Molokai—Lowland Wet—Unit 1, Molokai—Lowland Wet—Unit 2, and Molokai—Lowland Wet—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

(iv) In units Molokai—Wet Cliff—Unit 1, Molokai—Wet Cliff—Unit 2, and Molokai—Wet Cliff—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.

(D) Canopy: None.

(E) Subcanopy: *Broussaisia, Cheirodendron, Leptocophylla, Metrosideros.*

(F) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Sesbania tomentosa (OHAI)

Molokai—Coastal—Unit 1, Molokai—Coastal—Unit 2, Molokai—Coastal—Unit 3, Molokai—Coastal—Unit 4, Molokai—Coastal—Unit 5, Molokai—Coastal—Unit 6, Molokai—Coastal—Unit 7, Molokai—Lowland Dry—Unit 1, Molokai—Lowland Dry—Unit 2, and Molokai—Lowland Mesic—Unit 1, identified in the legal descriptions in paragraph (c) of this section, constitute critical habitat for *Sesbania tomentosa* on Molokai.

(i) In units Molokai—Coastal—Unit 1, Molokai—Coastal—Unit 2, Molokai—Coastal—Unit 3, Molokai—Coastal—Unit 4, Molokai—Coastal—Unit 5, Molokai—Coastal—Unit 6, and Molokai—Coastal—Unit 7, the physical and biological features of critical habitat are:

(A) Elevation: Less than 980 ft (300 m).

(B) Annual precipitation: Less than 20 in (50 cm).

(C) Substrate: Well-drained, calcareous, talus slopes; weathered clay soils; ephemeral pools; mudflats.

(D) Canopy: *Hibiscus, Myoporum, Santalum, Scaevola.*

(E) Subcanopy: *Gossypium, Sida, Vitex.*

(F) Understory: *Eragrostis, Jacquemontia, Lyceum, Nama, Sesuvium, Sporobolus, Vigna.*

(ii) In units Molokai—Lowland Dry—Unit 1 and Molokai—Lowland Dry—Unit 2, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Less than 50 in (130 cm).

(C) Substrate: Weathered silty loams to stony clay, rocky ledges, little-weathered lava.

(D) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus.*

(E) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia.*

(F) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Sicyos.*

(iii) In unit Molokai—Lowland Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Shallow soils, little to no herbaceous layer.

(D) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(E) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(F) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

Vigna o-wahuensis (NCN)

Molokai—Lowland Mesic—Unit 1, identified in the legal descriptions in paragraph (c) of this section, constitutes critical habitat for *Vigna o-wahuensis* on Molokai. In unit Molokai—Lowland Mesic—Unit 1, the physical and biological features of critical habitat are:

(i) Elevation: Less than 3,300 ft (1,000 m).

(ii) Annual precipitation: 50 to 75 in (130 to 190 cm).

(iii) Substrate: Shallow soils, little to no herbaceous layer.

(iv) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(v) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(vi) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

Family Gentianaceae

Schenkia sebaeoides (AWIWI)

Molokai—Coastal—Unit 1, Molokai—Coastal—Unit 2, Molokai—Coastal—Unit 3, Molokai—Coastal—Unit 4, Molokai—Coastal—Unit 5, Molokai—Coastal—Unit 6, and Molokai—Coastal—Unit 7, identified in the legal descriptions in paragraph (c) of this section, constitute critical habitat for *Schenkia sebaeoides* on Molokai. In units Molokai—Coastal—Unit 1, Molokai—Coastal—Unit 2, Molokai—Coastal—Unit 3, Molokai—Coastal—Unit 4, Molokai—Coastal—Unit 5, Molokai—Coastal—Unit 6, and Molokai—Coastal—Unit 7, the physical and biological features of critical habitat are:

(i) Elevation: Less than 980 ft (300 m).

(ii) Annual precipitation: Less than 20 in (50 cm).

(iii) Substrate: Well-drained, calcareous, talus slopes; weathered clay soils; ephemeral pools; mudflats.

(iv) Canopy: *Hibiscus, Myoporum, Santalum, Scaevola.*

(v) Subcanopy: *Gossypium, Sida, Vitex.*

(vi) Understory: *Eragrostis, Jacquemontia, Lyceum, Nama, Sesuvium, Sporobolus, Vigna.*

Family Gesneriaceae

Cyrtandra filipes (HAIWALE)

Molokai—Lowland Mesic—Unit 1, Molokai—Lowland Wet—Unit 1, Molokai—Lowland Wet—Unit 2, and Molokai—Lowland Wet—Unit 3, identified in the legal descriptions in paragraph (c) of this section, constitute critical habitat for *Cyrtandra filipes* on Molokai.

(i) In unit Molokai—Lowland Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Shallow soils, little to no herbaceous layer.

(D) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(E) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(F) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

(ii) In units Molokai—Lowland Wet—Unit 1, Molokai—Lowland Wet—Unit 2, and Molokai—Lowland Wet—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

Family Lamiaceae

Phyllostegia haliakalae (NCN)

Molokai—Lowland Mesic—Unit 1, identified in the legal descriptions in paragraph (c) of this section, constitutes critical habitat for *Phyllostegia haliakalae* on Molokai. In unit Molokai—Lowland Mesic—Unit 1, the physical and biological features of critical habitat are:

(i) Elevation: Less than 3,300 ft (1,000 m).

(ii) Annual precipitation: 50 to 75 in (130 to 190 cm).

(iii) Substrate: Shallow soils, little to no herbaceous layer.

(iv) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(v) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(vi) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

Phyllostegia hispida (NCN)

Molokai—Lowland Wet—Unit 1, Molokai—Lowland Wet—Unit 2, Molokai—Lowland Wet—Unit 3, Molokai—Montane Wet—Unit 1, Molokai—Montane Wet—Unit 2, Molokai—Montane Wet—Unit 3, Molokai—Wet Cliff—Unit 1, Molokai—Wet Cliff—Unit 2, and Molokai—Wet Cliff—Unit 3, identified in the legal descriptions in paragraph (c) of this section, constitute critical habitat for *Phyllostegia hispida* on Molokai.

(i) In units Molokai—Lowland Wet—Unit 1, Molokai—Lowland Wet—Unit 2, and Molokai—Lowland Wet—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

(ii) In units Molokai—Montane Wet—Unit 1, Molokai—Montane Wet—Unit 2, and Molokai—Montane Wet—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Well-developed soils, montane bogs.

(D) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(E) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(F) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

(iii) In units Molokai—Wet Cliff—Unit 1, Molokai—Wet Cliff—Unit 2, and Molokai—Wet Cliff—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.

(D) Canopy: None.

(E) Subcanopy: *Broussaisia, Cheirodendron, Leptocophylla, Metrosideros.*

(F) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Phyllostegia mannii (NCN)

Molokai—Lowland Mesic—Unit 1, Molokai—Lowland Wet—Unit 1, Molokai—Lowland Wet—Unit 2, Molokai—Lowland Wet—Unit 3, Molokai—Montane Wet—Unit 1, Molokai—Montane Wet—Unit 2, and Molokai—Montane Wet—Unit 3, identified in the legal descriptions in paragraph (c) of this section, constitute critical habitat for *Phyllostegia mannii* on Molokai.

(i) In unit Molokai—Lowland Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Shallow soils, little to no herbaceous layer.

(D) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(E) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(F) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

(ii) In units Molokai—Lowland Wet—Unit 1, Molokai—Lowland Wet—Unit 2, and Molokai—Lowland Wet—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

(iii) In units Molokai—Montane Wet—Unit 1, Molokai—Montane Wet—Unit 2, Molokai—Montane Wet—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Well-developed soils, montane bogs.

(D) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(E) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(F) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

Phyllostegia pilosa (NCN)

Molokai—Lowland Mesic—Unit 1, Molokai—Montane Wet—Unit 1, Molokai—Montane Wet—Unit 2, and Molokai—Montane Wet—Unit 3, identified in the legal descriptions in paragraph (c) of this section, constitute critical habitat for *Phyllostegia pilosa* on Molokai.

(i) In unit Molokai—Lowland Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Shallow soils, little to no herbaceous layer.

(D) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(E) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(F) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

(ii) In units Molokai—Montane Wet—Unit 1, Molokai—Montane Wet—Unit 2, and Molokai—Montane Wet—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Well-developed soils, montane bogs.

(D) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(E) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(F) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

Stenogyne bifida (NCN)

Molokai—Lowland Mesic—Unit 1, Molokai—Lowland Wet—Unit 1, Molokai—Lowland Wet—Unit 2, Molokai—Lowland Wet—Unit 3, Molokai—Montane Wet—Unit 1, Molokai—Montane Wet—Unit 2, Molokai—Montane Wet—Unit 3, Molokai—Montane Mesic—Unit 1, Molokai—Wet Cliff—Unit 1, Molokai—Wet Cliff—Unit 2, and Molokai—Wet Cliff—Unit 3, identified in the legal descriptions in paragraph (c) of this section, constitute critical habitat for *Stenogyne bifida* on Molokai.

(i) In unit Molokai—Lowland Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Shallow soils, little to no herbaceous layer.

(D) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(E) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(F) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

(ii) In units Molokai—Lowland Wet—Unit 1, Molokai—Lowland Wet—Unit 2, and Molokai—Lowland Wet—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

(iii) In units Molokai—Montane Wet—Unit 1, Molokai—Montane Wet—Unit 2, and Molokai—Montane Wet—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Well-developed soils, montane bogs.

(D) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(E) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(F) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

(iv) In unit Molokai—Montane Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Deep ash deposits, thin silty loams.

(D) Canopy: *Acacia, Ilex, Metrosideros, Myrsine, Nestegis, Nothocestrum, Pisonia, Pittosporum, Psychotria, Sophora, Zanthoxylum.*

(E) Subcanopy: *Alyxia, Charpentiera, Coprosma, Dodonaea, Kadua, Labordia, Leptecophylla, Phyllostegia, Vaccinium.*

(F) Understory: Ferns, *Carex, Peperomia.*

(v) In units Molokai—Wet Cliff—Unit 1, Molokai—Wet Cliff—Unit 2, and Molokai—Wet Cliff—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.

(D) Canopy: None.

(E) Subcanopy: *Broussaisia, Cheirodendron, Leptocophylla, Metrosideros.*

(F) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Family Loganiaceae

Labordia triflora (KAMAKAHALA)

Molokai—Lowland Mesic—Unit 1, identified in the legal descriptions in paragraph (c) of this section, constitute critical habitat for *Labordia triflora* on Molokai. In unit Molokai—Lowland Mesic—Unit 1, the physical and biological features of critical habitat are:

(i) Elevation: Less than 3,300 ft (1,000 m).

(ii) Annual precipitation: 50 to 75 in (130 to 190 cm).

(iii) Substrate: Shallow soils, little to no herbaceous layer.

(iv) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(v) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(vi) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

Family Malvaceae

Hibiscus arnottianus ssp. immaculatus (KOKIO KEOKEO)

Molokai—Coastal—Unit 1, Molokai—Coastal—Unit 2, Molokai—Coastal—Unit 3, Molokai—Coastal—Unit 4, Molokai—Coastal—Unit 5, Molokai—Coastal—Unit 6, Molokai—Coastal—Unit 7, Molokai—Wet Cliff—Unit 1, Molokai—Wet Cliff—Unit 2, and Molokai—Wet Cliff—Unit 3, identified in the legal descriptions in paragraph (c) of this section, constitute critical habitat for *Hibiscus arnottianus* ssp. *immaculatus* on Molokai.

(i) In units Molokai—Coastal—Unit 1, Molokai—Coastal—Unit 2, Molokai—Coastal—Unit 3, Molokai—Coastal—Unit 4, Molokai—Coastal—Unit 5, Molokai—Coastal—Unit 6, and Molokai—Coastal—Unit 7, the physical and biological features of critical habitat are:

(A) Elevation: Less than 980 ft (300 m).

(B) Annual precipitation: Less than 20 in (50 cm).

(C) Substrate: Well-drained, calcareous, talus slopes; weathered clay soils; ephemeral pools; mudflats.

(D) Canopy: *Hibiscus, Myoporum, Santalum, Scaevola.*

(E) Subcanopy: *Gossypium, Sida, Vitex.*

(F) Understory: *Eragrostis, Jacquemontia, Lyceum, Nama, Sesuvium, Sporobolus, Vigna.*

(ii) In units Molokai—Wet Cliff—Unit 1, Molokai—Wet Cliff—Unit 2, and Molokai—Wet Cliff—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Greater than 75 in (190 cm).
(C) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.
(D) Canopy: None.
(E) Subcanopy: *Broussaisia, Cheirodendron, Leptocophylla, Metrosideros.*
(F) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Hibiscus brackenridgei (MAO HAU HELE)

Molokai—Coastal—Unit 1, Molokai—Coastal—Unit 2, Molokai—Coastal—Unit 3, Molokai—Coastal—Unit 4, Molokai—Coastal—Unit 5, Molokai—Coastal—Unit 6, Molokai—Coastal—Unit 7, Molokai—Lowland Dry—Unit 1, and Molokai—Lowland Dry—Unit 2, identified in the legal descriptions in paragraph (c) of this section, constitute critical habitat for *Hibiscus brackenridgei* on Molokai.
(i) In units Molokai—Coastal—Unit 1, Molokai—Coastal—Unit 2, Molokai—Coastal—Unit 3, Molokai—Coastal—Unit 4, Molokai—Coastal—Unit 5, Molokai—Coastal—Unit 6, and Molokai—Coastal—Unit 7, the physical and biological features of critical habitat are:
(A) Elevation: Less than 980 ft (300 m).
(B) Annual precipitation: Less than 20 in (50 cm).
(C) Substrate: Well-drained, calcareous, talus slopes; weathered clay soils; ephemeral pools; mudflats.
(D) Canopy: *Hibiscus, Myoporum, Santalum, Scaevola.*
(E) Subcanopy: *Gossypium, Sida, Vitex.*
(F) Understory: *Eragrostis, Jacquemontia, Lyceum, Nama, Sesuvium, Sporobolus, Vigna.*
(ii) In units Molokai—Lowland Dry—Unit 1 and Molokai—Lowland Dry—Unit 2, the physical and biological features of critical habitat are:
(A) Elevation: Less than 3,300 ft (1,000 m).
(B) Annual precipitation: Less than 50 in (130 cm).
(C) Substrate: Weathered silty loams to stony clay, rocky ledges, little-weathered lava.
(D) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus.*
(E) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia.*
(F) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Sicyos.*

Kokia cookei (COOKE'S KOKIO)

Molokai—Lowland Dry—Unit 1 and Molokai—Lowland Dry—Unit 2, identified in the legal descriptions in paragraph (c) of this section, constitute critical habitat for *Kokia cookei* on Molokai. In units Molokai—Lowland Dry—Unit 1 and Molokai—Lowland Dry—Unit 2, the physical and biological features of critical habitat are:
(i) Elevation: Less than 3,300 ft (1,000 m).
(ii) Annual precipitation: Less than 50 in (130 cm).
(iii) Substrate: Weathered silty loams to stony clay, rocky ledges, little-weathered lava.
(iv) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus.*
(v) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia.*
(vi) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Sicyos.*

Family Myrtaceae

Eugenia koolauensis (NIOI)

Molokai—Lowland Dry—Unit 1 and Molokai—Lowland Dry—Unit 2, identified in the legal descriptions in paragraph (c) of this section, constitute critical habitat for *Eugenia koolauensis* on Molokai. In units Molokai—Lowland Dry—Unit 1 and Molokai—Lowland Dry—Unit 2, the physical and biological features of critical habitat are:
(i) Elevation: Less than 3,300 ft (1,000 m).
(ii) Annual precipitation: Less than 50 in (130 cm).
(iii) Substrate: Weathered silty loams to stony clay, rocky ledges, little-weathered lava.
(iv) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus.*
(v) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia.*
(vi) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Sicyos.*

Family Orchidaceae

Platanthera holochila (NCN)

Molokai—Montane Wet—Unit 1, Molokai—Montane Wet—Unit 2, and Molokai—Montane Wet—Unit 3, identified in the legal descriptions in paragraph (c) of this section, constitute critical habitat for *Platanthera holochila* on Molokai. In units Molokai—Montane Wet—Unit 1, Molokai—Montane Wet—Unit 2, and Molokai—Montane Wet—Unit 3, the physical and biological features of critical habitat are:
(i) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).
(ii) Annual precipitation: Greater than 75 in (190 cm).
(iii) Substrate: Well-developed soils, montane bogs.
(iv) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*
(v) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*
(vi) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

Family Pittosporaceae

Pittosporum halophilum (HOAWA)

Molokai—Coastal—Unit 1, Molokai—Coastal—Unit 2, Molokai—Coastal—Unit 3, Molokai—Coastal—Unit 4, Molokai—Coastal—Unit 5, Molokai—Coastal—Unit 6, and Molokai—Coastal—Unit 7, identified in the legal descriptions in paragraph (c) of this section, constitute critical habitat for *Pittosporum halophilum* on Molokai. In units Molokai—Coastal—Unit 1, Molokai—Coastal—Unit 2, Molokai—Coastal—Unit 3, Molokai—Coastal—Unit 4, Molokai—Coastal—Unit 5, Molokai—Coastal—Unit 6, and Molokai—Coastal—Unit 7, the physical and biological features of critical habitat are:
(i) Elevation: Less than 980 ft (300 m).
(ii) Annual precipitation: Less than 20 in (50 cm).
(iii) Substrate: Well-drained, calcareous, talus slopes; weathered clay soils; ephemeral pools; mudflats.
(iv) Canopy: *Hibiscus, Myoporum, Santalum, Scaevola.*
(v) Subcanopy: *Gossypium, Sida, Vitex.*
(vi) Understory: *Eragrostis, Jacquemontia, Lyceum, Nama, Sesuvium, Sporobolus, Vigna.*

Family Plantaginaceae

Plantago princeps (LAUKAHI KUAHIWI)

Molokai—Lowland Wet—Unit 1, Molokai—Lowland Wet—Unit 2, Molokai—Lowland Wet—Unit 3, and Molokai—Montane Mesic—Unit 1, identified in the legal descriptions in paragraph (c) of this section, constitute critical habitat for *Plantago princeps* on Molokai.
(i) In units Molokai—Lowland Wet—Unit 1, Molokai—Lowland Wet—Unit 2, and Molokai—Lowland Wet—Unit 3, the physical and biological features of critical habitat are:
(A) Elevation: Less than 3,300 ft (1,000 m).
(B) Annual precipitation: Greater than 75 in (190 cm).
(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.
(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*
(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*
(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

(ii) In unit Molokai—Montane Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Deep ash deposits, thin silty loams.

(D) Canopy: *Acacia, Ilex, Metrosideros, Myrsine, Nestegis, Nothocestrum, Pisonia, Pittosporum, Psychotria, Sophora, Zanthoxylum.*

(E) Subcanopy: *Alyxia, Charpentiera, Coprosma, Dodonaea, Kadua, Labordia, Leptecophylla, Phyllostegia, Vaccinium.*

(F) Understory: Ferns, *Carex, Peperomia.*

Family Poaceae

Festuca molokaiensis (NCN)

Molokai—Lowland Mesic—Unit 1, identified in the legal descriptions in paragraph (c) of this section, constitutes critical habitat for *Festuca molokaiensis* on Molokai. In unit Molokai—Lowland Mesic—Unit 1, the physical and biological features of critical habitat are:

(i) Elevation: Less than 3,300 ft (1,000 m).

(ii) Annual precipitation: 50 to 75 in (130 to 190 cm).

(iii) Substrate: Shallow soils, little to no herbaceous layer.

(iv) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(v) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(vi) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

Ischaemum byrone (HILO ISCHAEMUM)

Molokai—Coastal—Unit 1, Molokai—Coastal—Unit 2, Molokai—Coastal—Unit 3, Molokai—Coastal—Unit 4, Molokai—Coastal—Unit 5, Molokai—Coastal—Unit 6, and Molokai—Coastal—Unit 7, identified in the legal descriptions in paragraph (c) of this section, constitute critical habitat for *Ischaemum byrone* on Molokai. In units Molokai—Coastal—Unit 1, Molokai—Coastal—Unit 2, Molokai—Coastal—Unit 3, Molokai—Coastal—Unit 4, Molokai—Coastal—Unit 5, Molokai—Coastal—Unit 6, and Molokai—Coastal—Unit 7, the physical and biological features of critical habitat are:

(i) Elevation: Less than 980 ft (300 m).

(ii) Annual precipitation: Less than 20 in (50 cm).

(iii) Substrate: Well-drained, calcareous, talus slopes; weathered clay soils; ephemeral pools; mudflats.

(iv) Canopy: *Hibiscus, Myoporum, Santalum, Scaevola.*

(v) Subcanopy: *Gossypium, Sida, Vitex.*

(vi) Understory: *Eragrostis, Jacquemontia, Lyceum, Nama, Sesuvium, Sporobolus, Vigna.*

Family Primulaceae

Lysimachia maxima (NCN)

Molokai—Lowland Wet—Unit 1, Molokai—Lowland Wet—Unit 2, Molokai—Lowland Wet—Unit 3, Molokai—Montane Wet—Unit 1, Molokai—Montane Wet—Unit 2, and Molokai—Montane Wet—Unit 3, identified in the legal descriptions in paragraph (c) of this section, constitute critical habitat for *Lysimachia maxima* on Molokai.

(i) In units Molokai—Lowland Wet—Unit 1, Molokai—Lowland Wet—Unit 2, Molokai—Lowland Wet—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

(ii) In units Molokai—Montane Wet—Unit 1, Molokai—Montane Wet—Unit 2, and Molokai—Montane Wet—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Well-developed soils, montane bogs.

(D) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(E) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(F) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

Family Rhamnaceae

Gouania hillebrandii (NCN)

Molokai—Lowland Mesic—Unit 1, identified in the legal descriptions in paragraph (c) of this section, constitutes critical habitat for *Gouania hillebrandii* on Molokai. In unit Molokai—Lowland Mesic—Unit 1, the physical and biological features of critical habitat are:

(i) Elevation: Less than 3,300 ft (1,000 m).

(ii) Annual precipitation: 50 to 75 in (130 to 190 cm).

(iii) Substrate: Shallow soils, little to no herbaceous layer.

(iv) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(v) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(vi) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

Family Rubiaceae

Kadua laxiflora (PILO)

Molokai—Lowland Mesic—Unit 1 and Molokai—Montane Mesic—Unit 1, identified in the legal descriptions in paragraph (c) of this section, constitute critical habitat for *Kadua laxiflora* on Molokai.

(i) In unit Molokai—Lowland Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Shallow soils, little to no herbaceous layer.

(D) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(E) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(F) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

(ii) In unit Molokai—Montane Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Deep ash deposits, thin silty loams.

(D) Canopy: *Acacia, Ilex, Metrosideros, Myrsine, Nestegis, Nothocestrum, Pisonia, Pittosporum, Psychotria, Sophora, Zanthoxylum.*

(E) Subcanopy: *Alyxia, Charpentiera, Coprosma, Dodonaea, Kadua, Labordia, Leptecophylla, Phyllostegia, Vaccinium.*

(F) Understory: Ferns, *Carex, Peperomia.*

Family Rutaceae

Melicope mucronulata (ALANI)

Molokai—Lowland Mesic—Unit 1 and Molokai—Montane Mesic—Unit 1, identified in the legal descriptions in paragraph (c) of this section, constitute critical habitat for *Melicope mucronulata* on Molokai.

(i) In unit Molokai—Lowland Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Shallow soils, little to no herbaceous layer.

(D) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(E) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(F) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

(ii) In unit Molokai—Montane Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Deep ash deposits, thin silty loams.

(D) Canopy: *Acacia, Ilex, Metrosideros, Myrsine, Nestegis, Nothocestrum, Pisonia, Pittosporum, Psychotria, Sophora, Zanthoxylum.*

(E) Subcanopy: *Alyxia, Charpentiera, Coprosma, Dodonaea, Kadua, Labordia, Leptecophylla, Phyllostegia, Vaccinium.*

(F) Understory: Ferns, *Carex, Peperomia.*

Melicope munroi (ALANI)

Molokai—Lowland Mesic—Unit 1, identified in the legal descriptions in paragraph (c) of this section, constitutes critical habitat for *Melicope munroi* on Molokai. In unit Molokai—Lowland Mesic—Unit 1, the physical and biological features of critical habitat are:

(i) Elevation: Less than 3,300 ft (1,000 m).

(ii) Annual precipitation: 50 to 75 in (130 to 190 cm).

(iii) Substrate: Shallow soils, little to no herbaceous layer.

(iv) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(v) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(vi) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

Melicope reflexa (ALANI)

Molokai—Lowland Mesic—Unit 1, Molokai—Lowland Wet—Unit 1, Molokai—Lowland Wet—Unit 2, Molokai—Lowland Wet—Unit 3, Molokai—Montane Wet—Unit 1, Molokai—Montane Wet—Unit 2, and Molokai—Montane Wet—Unit 3, identified in the legal descriptions in paragraph (c) of this section, constitute critical habitat for *Melicope reflexa* on Molokai.

(i) In unit Molokai—Lowland Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Shallow soils, little to no herbaceous layer.

(D) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(E) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(F) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

(ii) In units Molokai—Lowland Wet—Unit 1, Molokai—Lowland Wet—Unit 2, and Molokai—Lowland Wet—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

(iii) In units Molokai—Montane Wet—Unit 1, Molokai—Montane Wet—Unit 2, and Molokai—Montane Wet—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Well-developed soils, montane bogs.

(D) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(E) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(F) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

Zanthoxylum hawaiiense (AE)

Molokai—Lowland Mesic—Unit 1, Molokai—Lowland Wet—Unit 1, Molokai—Lowland Wet—Unit 2, Molokai—Lowland Wet—Unit 3, Molokai—Montane Wet—Unit 1, Molokai—Montane Wet—Unit 2, and Molokai—Montane Wet—Unit 3, identified in the legal descriptions in paragraph (c) of this section, constitute critical habitat for *Zanthoxylum hawaiiense* on Molokai.

(i) In unit Molokai—Lowland Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Shallow soils, little to no herbaceous layer.

(D) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(E) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(F) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

(ii) In units Molokai—Lowland Wet—Unit 1, Molokai—Lowland Wet—Unit 2, and Molokai—Lowland Wet—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

(iii) In units Molokai—Montane Wet—Unit 1, Molokai—Montane Wet—Unit 2, and Molokai—Montane Wet—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Well-developed soils, montane bogs.

(D) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(E) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(F) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

Family Santalaceae

Santalum haleakalae var. lanaiense (LANAI SANDALWOOD, ILIAHI)

Molokai—Lowland Mesic—Unit 1 and Molokai—Montane Mesic—Unit 1, identified in the legal descriptions in paragraph (c) of this section, constitute critical habitat for *Santalum haleakalae* var. *lanaiense* on Molokai.

(i) In unit Molokai—Lowland Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Shallow soils, little to no herbaceous layer.

(D) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(E) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(F) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

(ii) In unit Molokai—Montane Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Deep ash deposits, thin silty loams.

(D) Canopy: *Acacia, Ilex, Metrosideros, Myrsine, Nestegis, Nothocestrum, Pisonia, Pittosporum, Psychotria, Sophora, Zanthoxylum.*

(E) Subcanopy: *Alyxia, Charpentiera, Coprosma, Dodonaea, Kadua, Labordia, Leptecophylla, Phyllostegia, Vaccinium.*

(F) Understory: Ferns, *Carex, Peperomia.*

Family Sapindaceae

Alectryon macrococcus (MAHOE)

Molokai—Lowland Mesic—Unit 1 and Molokai—Montane Mesic—Unit 1, identified in the legal descriptions in paragraph (c) of this section, constitute critical habitat for *Alectryon macrococcus* on Molokai.

(i) In unit Molokai—Lowland Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Shallow soils, little to no herbaceous layer.

(D) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(E) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(F) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

(ii) In unit Molokai—Montane Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Deep ash deposits, thin silty loams.

(D) Canopy: *Acacia, Ilex, Metrosideros, Myrsine, Nestegis, Nothocestrum, Pisonia, Pittosporum, Psychotria, Sophora, Zanthoxylum.*

(E) Subcanopy: *Alyxia, Charpentiera, Coprosma, Dodonaea, Kadua, Labordia, Leptecophylla, Phyllostegia, Vaccinium.*

(F) Understory: Ferns, *Carex, Peperomia.*

Family Urticaceae

Neraudia sericea (NCN)

Molokai—Lowland Mesic—Unit 1 and Molokai—Montane Mesic—Unit 1, identified in the legal descriptions in paragraph (c) of this section, constitute critical habitat for *Neraudia sericea* on Molokai.

(i) In unit Molokai—Lowland Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 (1,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Shallow soils, little to no herbaceous layer.

(D) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(E) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(F) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

(ii) In unit Molokai—Montane Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Deep ash deposits, thin silty loams.

(D) Canopy: *Acacia, Ilex, Metrosideros, Myrsine, Nestegis, Nothocestrum, Pisonia, Pittosporum, Psychotria, Sophora, Zanthoxylum.*

(E) Subcanopy: *Alyxia, Charpentiera, Coprosma, Dodonaea, Kadua, Labordia, Leptecophylla, Phyllostegia, Vaccinium.*

(F) Understory: Ferns, *Carex, Peperomia.*

Family Violaceae

Isodendrion pyrifolium (WAHINE NOHO KULA)

Molokai—Lowland Mesic—Unit 1, identified in the legal descriptions in paragraph (c) of this section, constitutes critical habitat for *Isodendrion pyrifolium* on Molokai. In unit Molokai—Lowland Mesic—Unit 1, the physical and biological features of critical habitat are:

(i) Elevation: Less than 3,300 ft (1,000 m).

(ii) Annual precipitation: 50 to 75 in (130 to 190 cm).

(iii) Substrate: Shallow soils, little to no herbaceous layer.

(iv) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(v) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(vi) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

(2) *Ferns and fern allies.*

Family Adiantaceae

Pteris lidgatei (NCN)

Molokai—Montane Wet—Unit 1, Molokai—Montane Wet—Unit 2, Molokai—Montane Wet—Unit 3, Molokai—Wet Cliff—Unit 1, Molokai—Wet Cliff—Unit 2, and Molokai—Wet Cliff—Unit 3, identified in the legal descriptions in paragraph (c) of this section, constitute critical habitat for *Pteris lidgatei* on Molokai.

(i) In units Molokai—Montane Wet—Unit 1, Molokai—Montane Wet—Unit 2, and Molokai—Montane Wet—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Well-developed soils, montane bogs.

(D) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(E) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(F) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

(ii) In units Molokai—Wet Cliff—Unit 1, Molokai—Wet Cliff—Unit 2, and Molokai—Wet Cliff—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.

(D) Canopy: None.

(E) Subcanopy: *Broussaisia, Cheirodendron, Leptocophylla, Metrosideros.*

(F) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Family Aspleniaceae

Asplenium dielerectum (ASPLENIUM-LEAVED DIELLIA)

Molokai—Lowland Mesic—Unit 1, Molokai—Lowland Wet—Unit 1, Molokai—Lowland Wet—Unit 2, Molokai—Lowland Wet—Unit 3, and Molokai—Montane Mesic—Unit 1, identified in the legal descriptions in paragraph (c) of this section, constitute critical habitat for *Asplenium dielerectum* on Molokai.

(i) In unit Molokai—Lowland Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Shallow soils, little to no herbaceous layer.

(D) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(E) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(F) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

(ii) In units Molokai—Lowland Wet—Unit 1, Molokai—Lowland Wet—Unit 2, and Molokai—Lowland Wet—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

(iii) In unit Molokai—Montane Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Deep ash deposits, thin silty loams.

(D) Canopy: *Acacia, Ilex, Metrosideros, Myrsine, Nestegis, Nothocestrum, Pisonia, Pittosporum, Psychotria, Sophora, Zanthoxylum.*

(E) Subcanopy: *Alyxia, Charpentiera, Coprosma, Dodonaea, Kadua, Labordia, Leptecophylla, Phyllostegia, Vaccinium.*

(F) Understory: Ferns, *Carex, Peperomia.*

Ctenitis squamigera (PAUOA)

Molokai—Lowland Mesic—Unit 1, identified in the legal descriptions in paragraph (c) of this section, constitutes critical habitat for *Ctenitis squamigera* on Molokai. In unit Molokai—Lowland Mesic—Unit 1, the physical and biological features of critical habitat are:

(i) Elevation: Less than 3,300 ft (1,000 m).

(ii) Annual precipitation: 50 to 75 in (130 to 190 cm).

(iii) Substrate: Shallow soils, little to no herbaceous layer.

(iv) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(v) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(vi) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

Diplazium molokaiense (NCN)

Molokai—Lowland Mesic—Unit 1, identified in the legal descriptions in paragraph (c) of this section, constitutes critical habitat for *Diplazium molokaiense* on Molokai. In unit Molokai—Lowland Mesic—Unit 1, the physical and biological features of critical habitat are:

(i) Elevation: Less than 3,300 ft (1,000 m).

(ii) Annual precipitation: 50 to 75 in (130 to 190 cm).

(iii) Substrate: Shallow soils, little to no herbaceous layer.

(iv) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(v) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(vi) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

Family Grammitidaceae

Adenophorus periens (PENDANT KIHI FERN)

Molokai—Montane Wet—Unit 1, Molokai—Montane Wet—Unit 2, and Molokai—Montane Wet—Unit 3, identified in the legal descriptions in paragraph (c) of this section, constitute critical habitat for *Adenophorus periens* on Molokai. In units Molokai—Montane Wet—Unit 1, Molokai—Montane Wet—Unit 2, and Molokai—Montane Wet—Unit 3, the physical and biological features of critical habitat are:

(i) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(ii) Annual precipitation: Greater than 75 in (190 cm).

(iii) Substrate: Well-developed soils, montane bogs.

(iv) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(v) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(vi) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

Family Marsileaceae

Marsilea villosa (IHI IHI)

Molokai—Coastal—Unit 1, Molokai—Coastal—Unit 2, Molokai—Coastal—Unit 3, Molokai—Coastal—Unit 4, Molokai—Coastal—Unit 5, Molokai—Coastal—Unit 6, and Molokai—Coastal—Unit 7, identified in the legal descriptions in paragraph (c) of this section, constitute critical habitat for *Marsilea villosa* on Molokai. In units Molokai—Coastal—Unit 1, Molokai—Coastal—Unit 2, Molokai—Coastal—Unit 3, Molokai—Coastal—Unit 4, Molokai—Coastal—Unit 5, Molokai—Coastal—Unit 6, and Molokai—Coastal—Unit 7, the physical and biological features of critical habitat are:

(i) Elevation: Less than 980 ft (300 m).

(ii) Annual precipitation: Less than 20 in (50 cm).

(iii) Substrate: Well-drained, calcareous, talus slopes; weathered clay soils; ephemeral pools; mudflats.

(iv) Canopy: *Hibiscus, Myoporum, Santalum, Scaevola.*

(v) Subcanopy: *Gossypium, Sida, Vitex.*

(vi) Understory: *Eragrostis, Jacquemontia, Lyceum, Nama, Sesuvium, Sporobolus, Vigna.*

(e) *Maps and critical habitat unit descriptions for the islands of Maui and Kahoolawe, HI.*

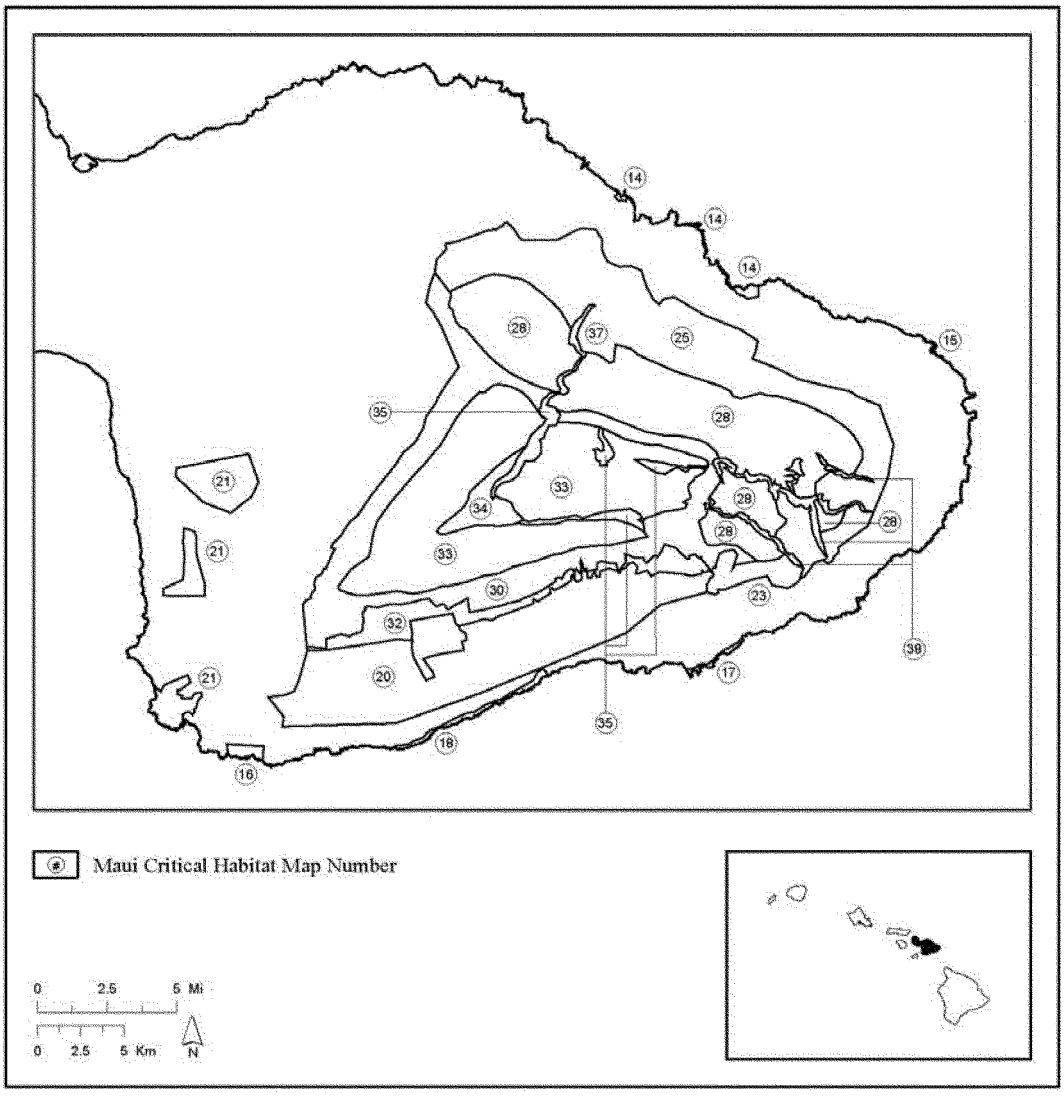
(1) *Maui.* Critical habitat units are described below. Coordinates are in UTM Zone 4 with units in meters using North American Datum of 1983 (NAD83). The following maps show the general locations of the critical habitat units designated on the island of Maui. Existing manmade features and structures, such as buildings, roads, railroads, airports, runways, other paved areas, lawns, and other urban landscaped areas, do not contain one or more of the physical and biological features. Federal actions limited to those areas, therefore, would not trigger a consultation under section 7 of the Act unless they may affect the species or physical or biological features in adjacent critical habitat.

(i) NOTE: Map 1—East Maui Index map follows:

BILLING CODE 4310–55–P

Map 1

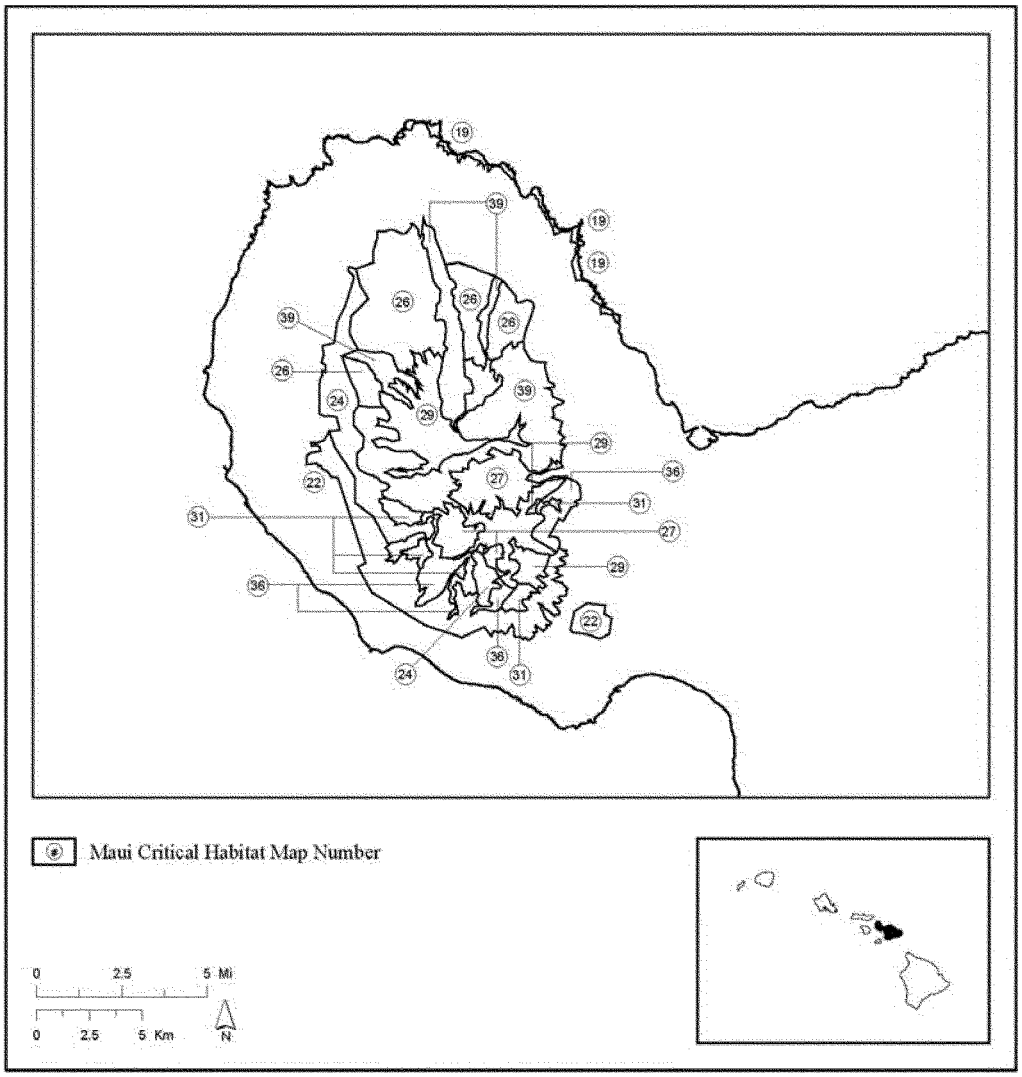
Maui Critical Habitat—East Maui Index Map



(ii) NOTE: Map 2—West Maui Index map follows:

Map 2

Maui Critical Habitat—West Maui Index Map



(iii) Maui—Coastal—Unit 1 (2 ac, 1 ha), Maui—Coastal—Unit 2 (68 ac, 28 ha), Maui—Coastal—Unit 3 (54 ac, 22 ha), and Maui—Coastal—Unit 4 (243 ac, 98 ha).

(A) [Reserved for textual description of Unit 1.] This unit is critical habitat for *Brighamia rockii, Cyperus pennatiformis, Ischaemum byrone, Peucedanum sandwicense,* and *Vigna o-wahuensis.*

(B) [Reserved for textual description of Unit 2.] This unit is critical habitat for *Brighamia rockii, Cyperus pennatiformis, Ischaemum byrone, Peucedanum sandwicense,* and *Vigna o-wahuensis.*

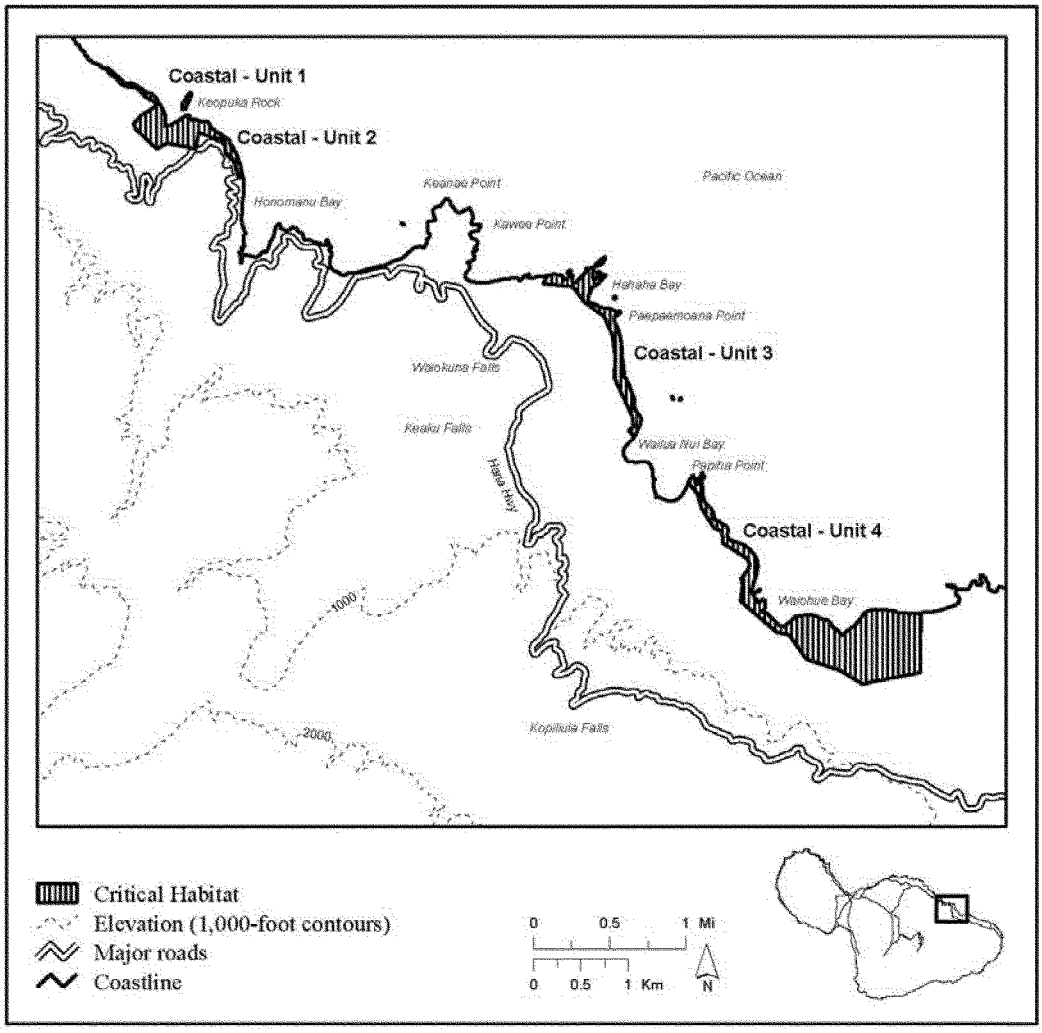
(C) [Reserved for textual description of Unit 3.] This unit is critical habitat for *Brighamia rockii, Cyperus pennatiformis* ssp. *pennatiformis, Ischaemum byrone, Peucedanum sandwicense,* and *Vigna o-wahuensis.*

(D) [Reserved for textual description of Unit 4.] This unit is critical habitat for *Brighamia rockii, Cyperus pennatiformis, Ischaemum byrone, Peucedanum sandwicense,* and *Vigna o-wahuensis.*

(E) NOTE: Map of Maui—Coastal—Unit 1, Maui—Coastal—Unit 2, Maui—Coastal—Unit 3, and Maui—Coastal—Unit 4 (Map 3) follows:

Map 3

Maui–Coastal Unit 1, Unit 2, Unit 3 and Unit 4



(iv) Maui—Coastal—Unit 5 (27 ac, 11 ha).

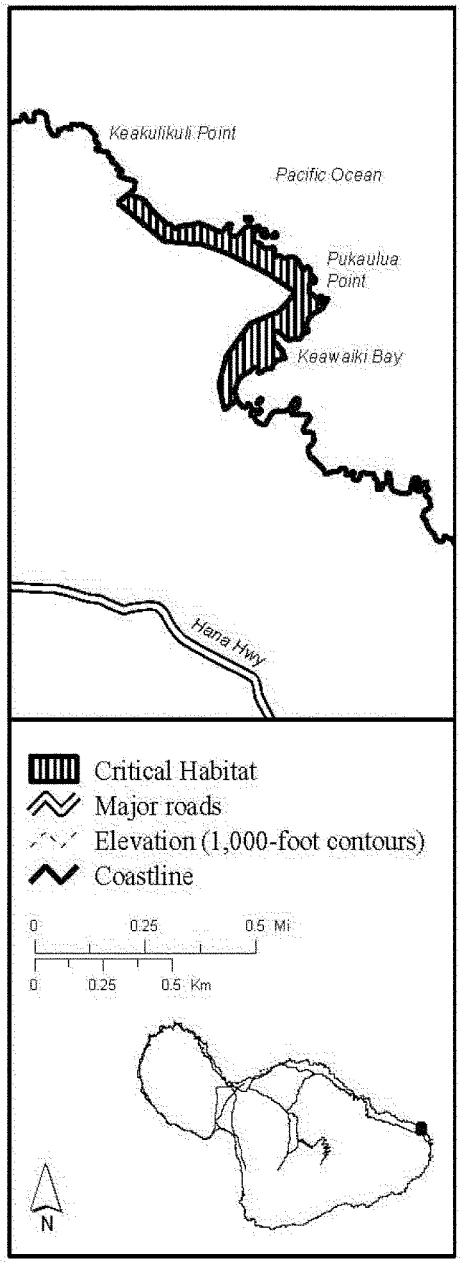
(A) [Reserved for textual description of Unit 5.] This unit is critical habitat for *Brighamia rockii, Cyperus pennatiformis, Ischaemum byrone, Peucedanum sandwicense,* and *Vigna o-wahuensis.*

(B) NOTE: Map of Maui—Coastal—Unit 5 (Map 4) follows:

Map 4

Maui–Coastal

Unit 5



(v) Maui—Coastal—Unit 6 (357 ac, 144 ha)

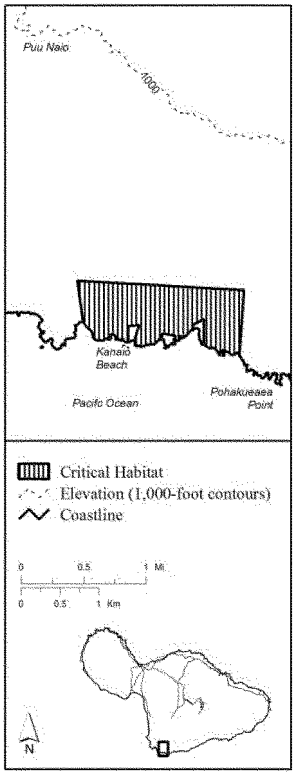
(A) [Reserved for textual description of Unit 6.] This unit is critical habitat for *Brighamia rockii, Cyperus pennatiformis* ssp. *pennatiformis, Ischaemum byrone, Peucedanum sandwicense,* and *Vigna o-wahuensis.*

(B) NOTE: Map of Maui—Coastal—Unit 6 (Map 5) follows:

Map 5

Maui–Coastal

Unit 6



(vi) Maui—Coastal—Unit 7 (187 ac, 75 ha)

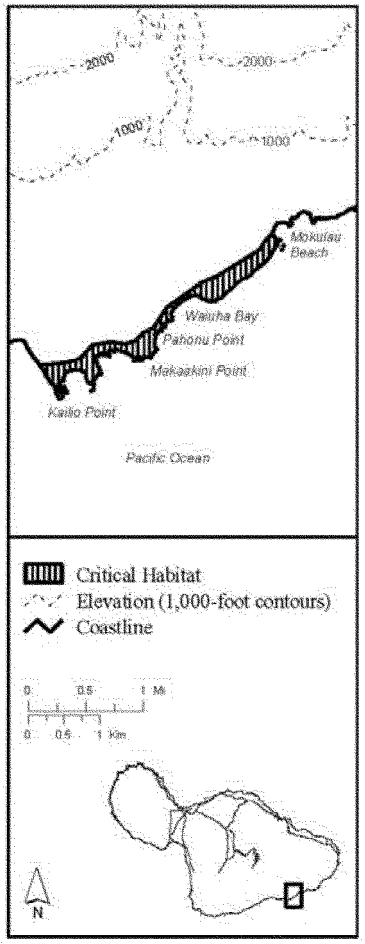
(A) [Reserved for textual description of Unit 7.] This unit is critical habitat for *Brighamia rockii, Cyperus pennatiformis, Ischaemum byrone, Peucedanum sandwicense,* and *Vigna o-wahuensis.*

(B) NOTE: Map of Maui—Coastal—Unit 7 (Map 6) follows:

Map 6

Maui–Coastal

Unit 7



(vii) Maui—Coastal—Unit 8 (597 ac, 242 ha)

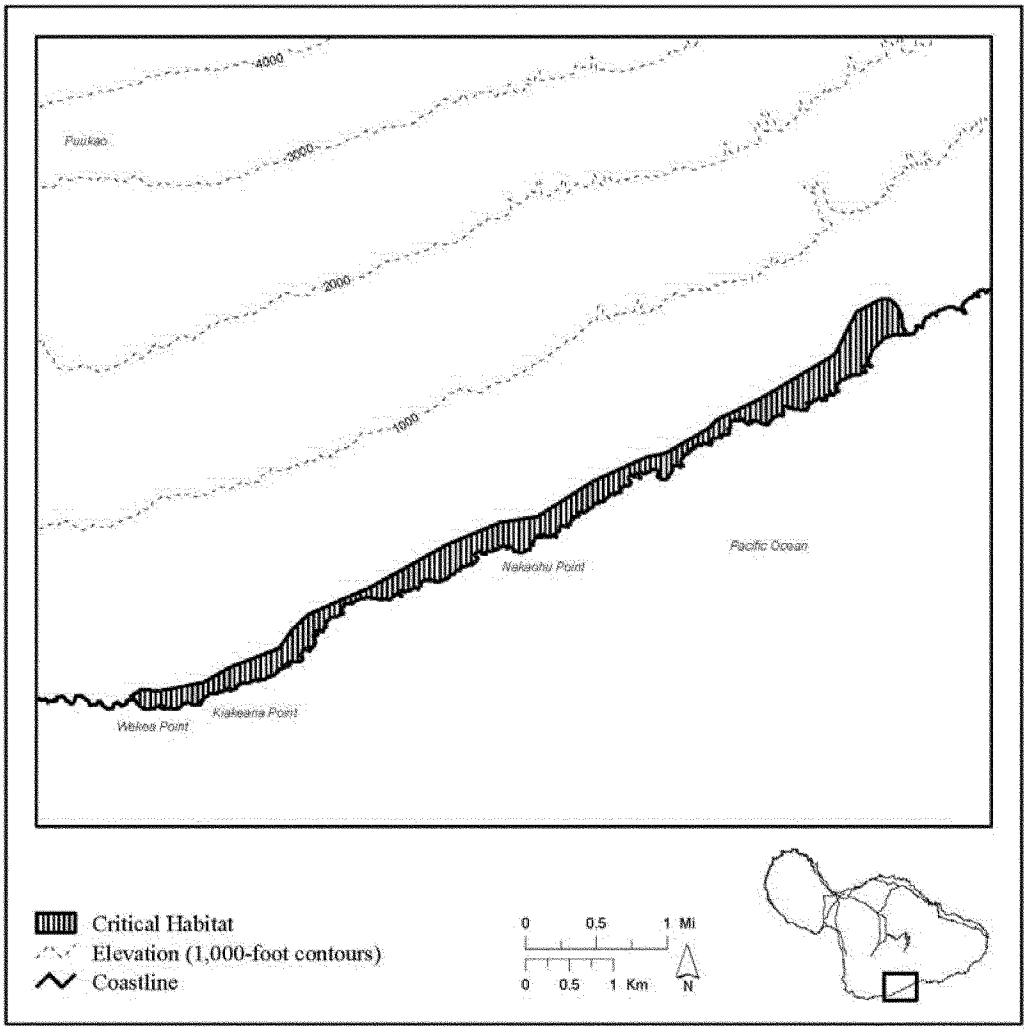
(A) [Reserved for textual description of Unit 8.] This unit is critical habitat for *Brighamia rockii, Cyperus pennatiformis, Ischaemum byrone, Peucedanum sandwicense,* and *Vigna o-wahuensis.*

(B) NOTE: Map of Maui—Coastal—Unit 8 (Map 7) follows:

Map 7

Maui–Coastal

Unit 8



(viii) Maui—Coastal—Unit 9 (393 ac, 159 ha), Maui—Coastal—Unit 10 (434 ac, 176 ha), and Maui—Coastal—Unit 11 (6 ac, 3 ha)

(A) [Reserved for textual description of Unit 9.] This unit is critical habitat for *Brighamia rockii, Schenkia sebaeoides,* and *Sesbania tomentosa.*

(B) [Reserved for textual description of Unit 10.] This unit is critical habitat for *Brighamia rockii, Schenkia sebaeoides,* and *Sesbania tomentosa.*

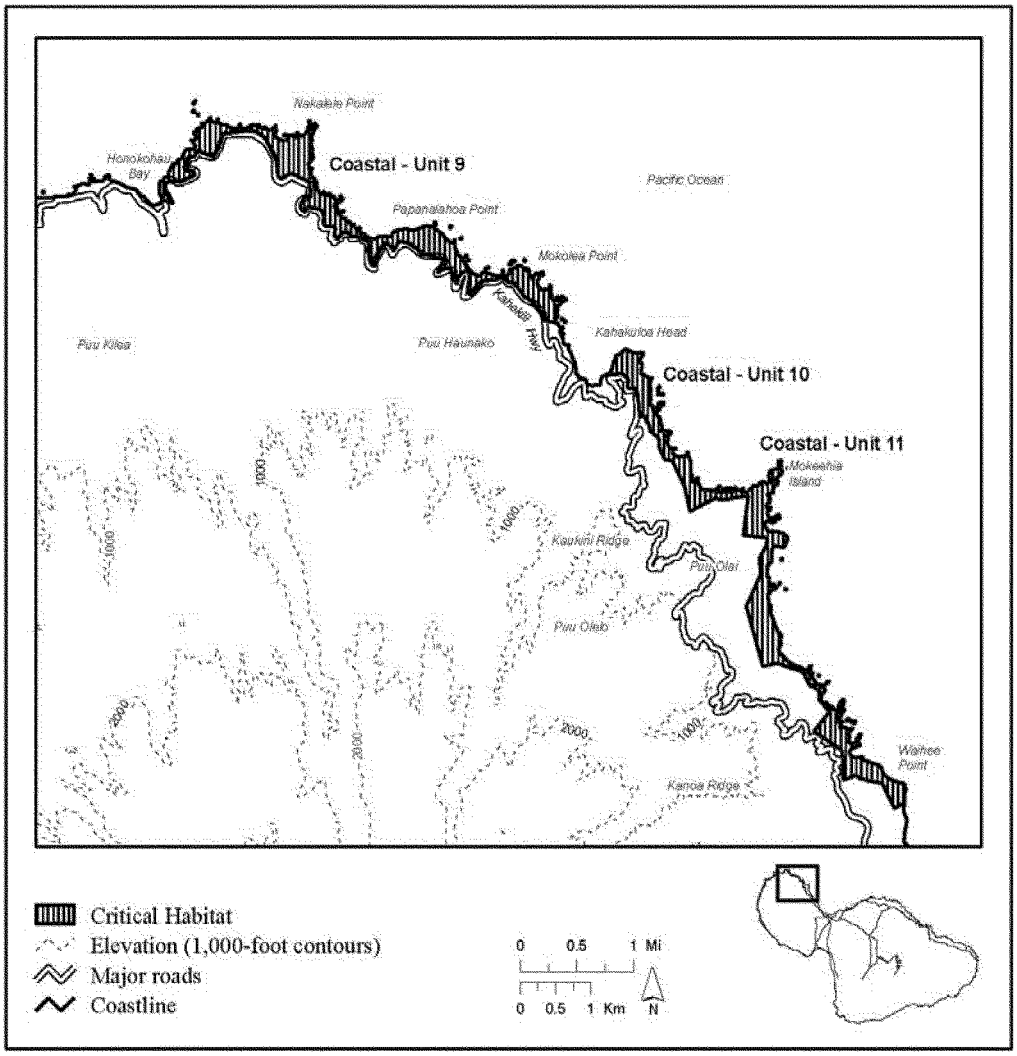
(C) [Reserved for textual description of Unit 11.] This unit is critical habitat for *Brighamia rockii, Schenkia sebaeoides,* and *Sesbania tomentosa.*

(D) NOTE: Map of Maui—Coastal–Unit 9, Maui—Coastal—Unit 10, and Maui—Coastal—Unit 11 (Map 8) follows:

Map 8

Maui–Coastal

Unit 9, Unit 10 and Unit 11



(ix) Maui—Lowland Dry—Unit 1 (22,196 ac, 8,983 ha)

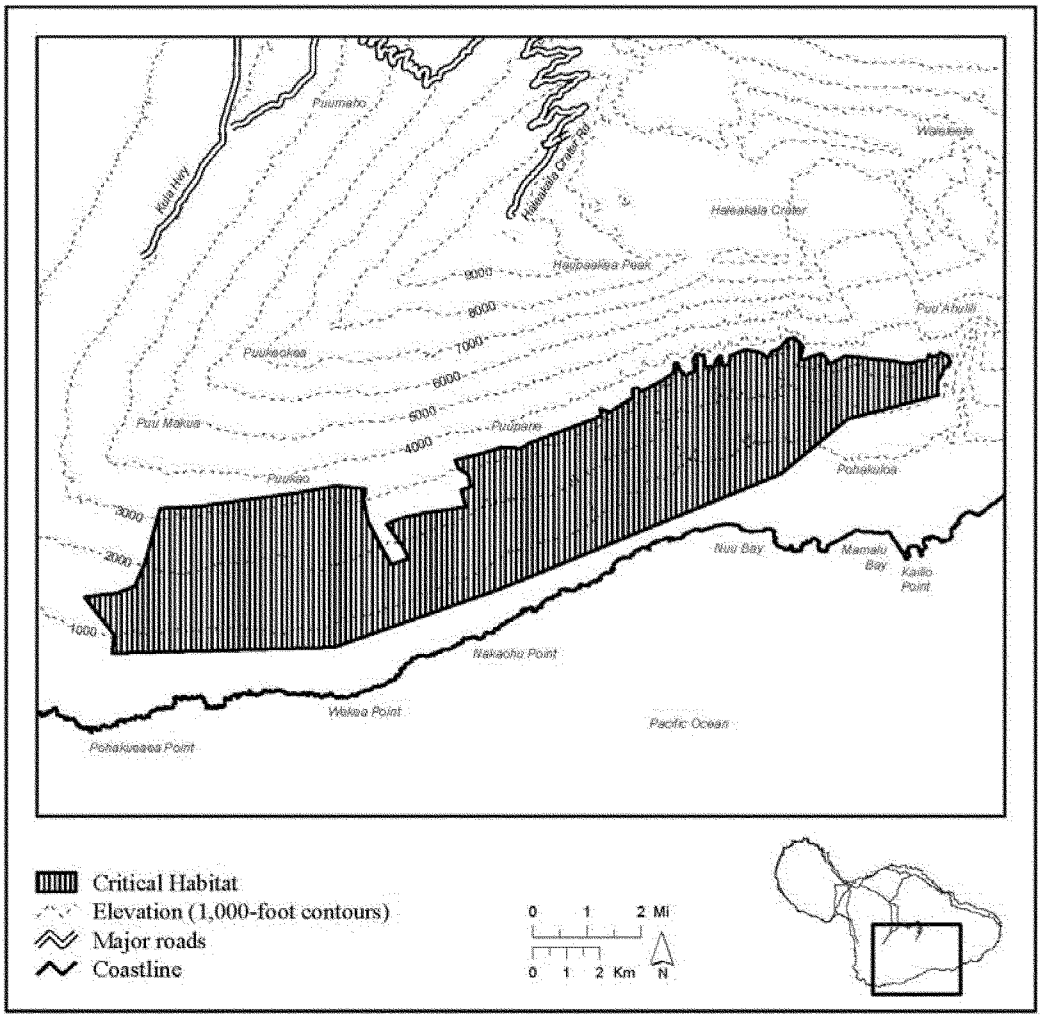
(A) [Reserved for textual description of Unit 1.] This unit is critical habitat for *Alectryon macrococcus, Bidens micrantha* ssp. *kalealaha, Bonamia menziesii, Canavalia pubescens, Cenchrus agrimonioides, Colubrina oppositifolia, Ctenitis squamigera, Flueggea neowawraea, Hibiscus brackenridgei, Melanthera kamolensis, Melicope adscendens, Melicope mucronulata, Neraudia sericea, Nototrichium humile, Santalum haleakalae* var. *lanaiense, Sesbania tomentosa, Solanum incompletum, Spermolepis hawaiiensis,* and *Zanthoxylum hawaiiense.*

(B) NOTE: Map of Maui—Lowland Dry—Unit 1 (Map 9) follows:

Map 9

Maui–Lowland Dry

Unit 1



(x) Maui—Lowland Dry—Unit 2 (2,612 ac, 1,057 ha), Maui—Lowland Dry—Unit 3 (1,089 ac, 441 ha), and Maui—Lowland Dry—Unit 4 (1,283 ac, 519 ha)

(A) [Reserved for textual description of Unit 2.] This unit is critical habitat for *Alectryon macrococcus, Bidens micrantha* ssp. *kalealaha, Bonamia menziesii, Canavalia pubescens, Cenchrus agrimonioides, Colubrina oppositifolia, Ctenitis squamigera, Flueggea neowawraea, Hibiscus brackenridgei, Melanthera kamolensis, Melicope adscendens, Melicope mucronulata, Neraudia sericea, Nototrichium humile, Santalum haleakalae* var. *lanaiense, Sesbania tomentosa, Solanum incompletum, Spermolepis hawaiiensis,* and *Zanthoxylum hawaiiense.*

(B) [Reserved for textual description of Unit 3.] This unit is critical habitat for *Alectryon macrococcus, Bidens micrantha* ssp. *kalealaha, Bonamia menziesii, Canavalia pubescens, Cenchrus agrimonioides, Colubrina oppositifolia, Ctenitis squamigera, Flueggea neowawraea, Hibiscus brackenridgei, Melanthera kamolensis, Melicope adscendens, Melicope mucronulata, Neraudia sericea, Nototrichium humile, Santalum haleakalae* var. *lanaiense, Sesbania tomentosa, Solanum incompletum, Spermolepis hawaiiensis,* and *Zanthoxylum hawaiiense.*

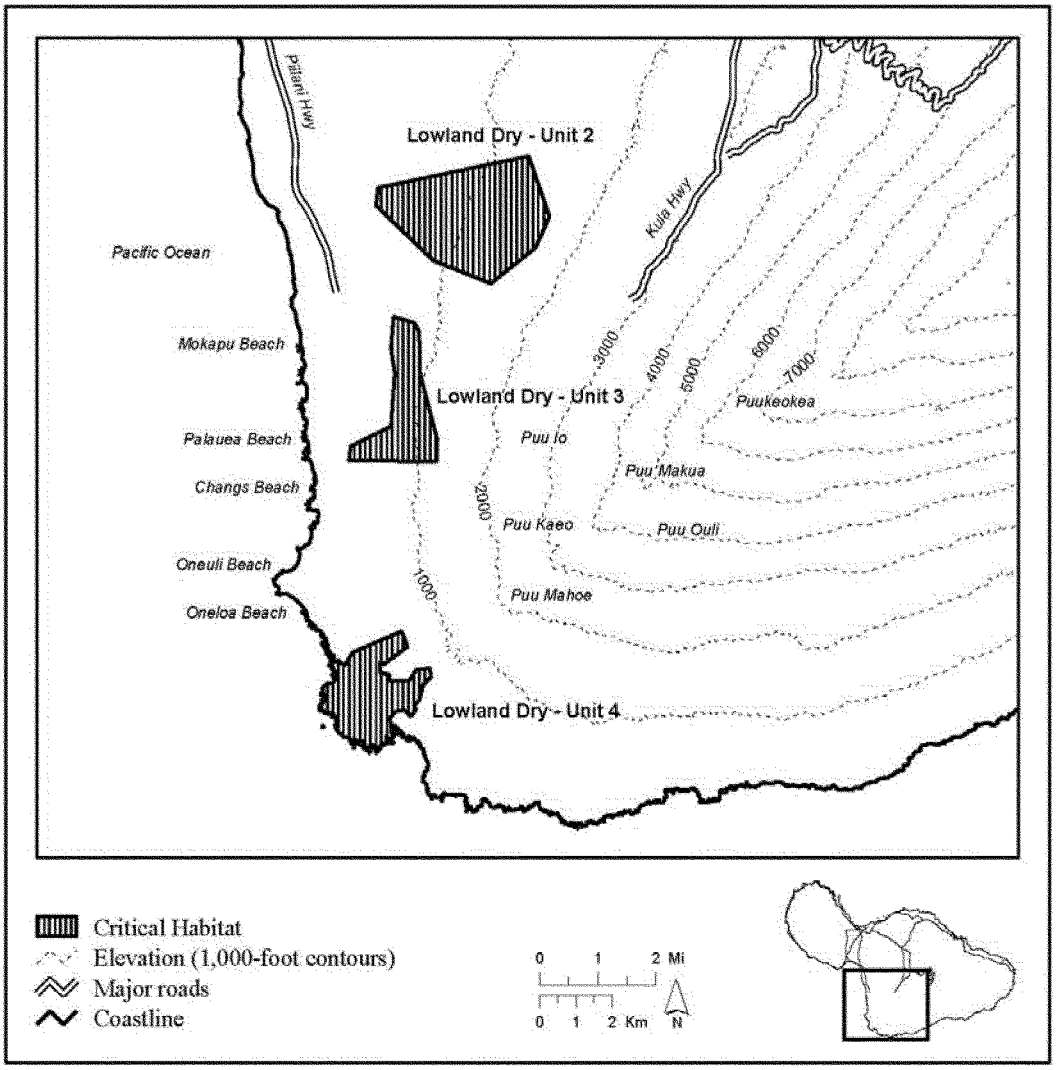
(C) [Reserved for textual description of Unit 4.] This unit is critical habitat for *Alectryon macrococcus, Bidens micrantha* ssp. *kalealaha, Bonamia menziesii, Canavalia pubescens, Cenchrus agrimonioides, Colubrina oppositifolia, Ctenitis squamigera, Flueggea neowawraea, Hibiscus brackenridgei, Melanthera kamolensis, Melicope adscendens, Melicope mucronulata, Neraudia sericea, Nototrichium humile, Santalum haleakalae* var. *lanaiense, Sesbania tomentosa, Solanum incompletum, Spermolepis hawaiiensis,* and *Zanthoxylum hawaiiense.*

(D) NOTE: Map of Maui—Lowland Dry—Unit 2, Maui—Lowland Dry—Unit 3, and Maui—Lowland Dry—Unit 4 (Map 10) follows:

Map 10

Maui–Lowland Dry

Unit 2, Unit 3 and Unit 4



(xi) Maui—Lowland Dry—Unit 5 (5,448 ac, 2,205 ha) and Maui—Lowland Dry—Unit 6 (579 ac, 234 ha)

(A) [Reserved for textual description of Unit 5.] This unit is critical habitat for *Asplenium dielerectum, Bidens campylotheca* ssp. *pentamera, Cenchrus agrimonioides, Ctenitis squamigera, Cyanea obtusa, Gouania hillebrandii, Hesperomannia arbuscula, Hibiscus brackenridgei, Kadua coriacea, Lysimachia lydgatei, Neraudia sericea, Remya mauiensis, Santalum haleakalae* var. *lanaiense, Schiedea salicaria, Sesbania tomentosa, Spermolepis hawaiiensis, Tetramolopium capillare,* and *Tetramolopium remyi.*

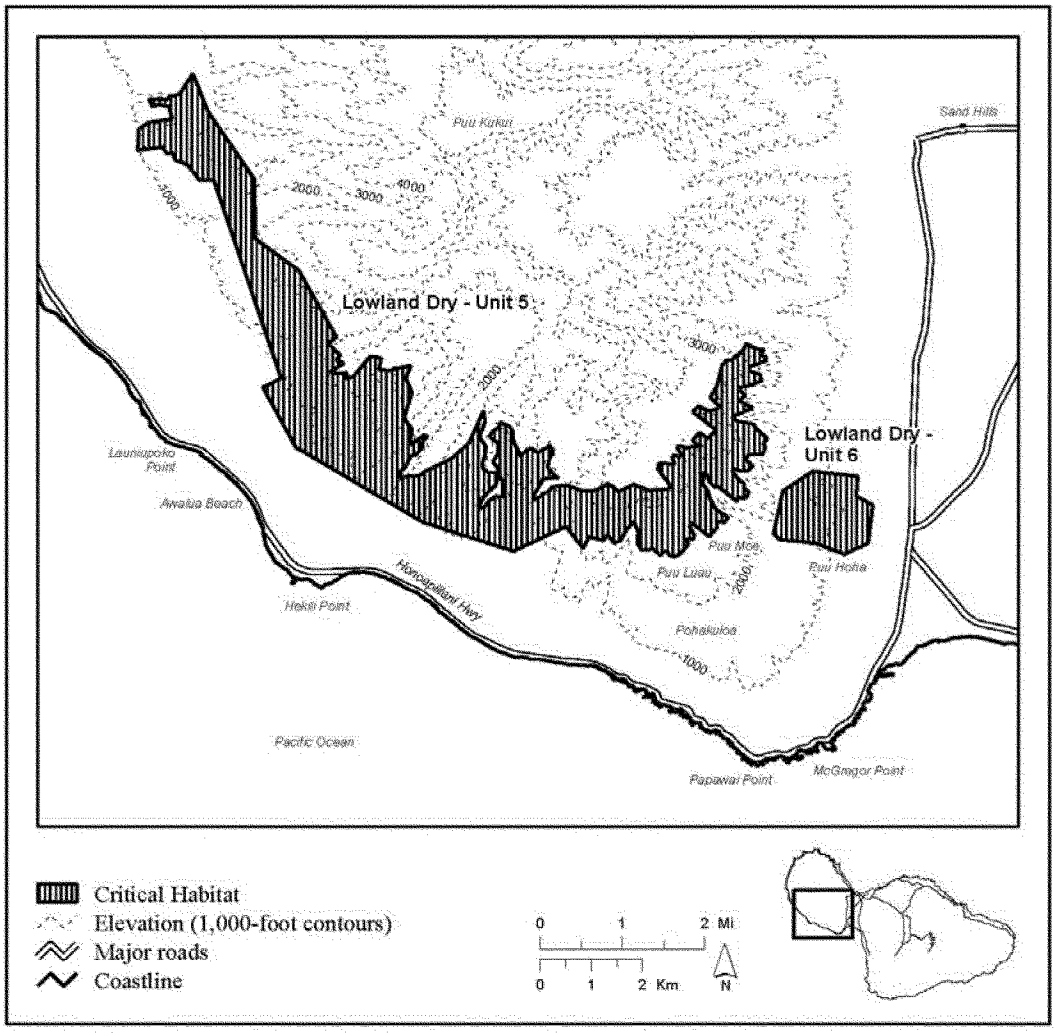
(B) [Reserved for textual description of Unit 6.] This unit is critical habitat for *Asplenium dielerectum, Bidens campylotheca* ssp. *pentamera, Cenchrus agrimonioides, Ctenitis squamigera, Cyanea obtusa, Gouania hillebrandii, Hesperomannia arbuscula, Hibiscus brackenridgei, Kadua coriacea, Lysimachia lydgatei, Neraudia sericea, Remya mauiensis, Santalum haleakalae* var. *lanaiense, Schiedea salicaria, Sesbania tomentosa, Spermolepis hawaiiensis, Tetramolopium capillare,* and *Tetramolopium remyi.*

(C) NOTE: Map of Maui—Lowland Dry—Unit 5 and Maui—Lowland Dry—Unit 6 (Map 11) follows:

Map 11

Maui–Lowland Dry

Unit 5 and Unit 6



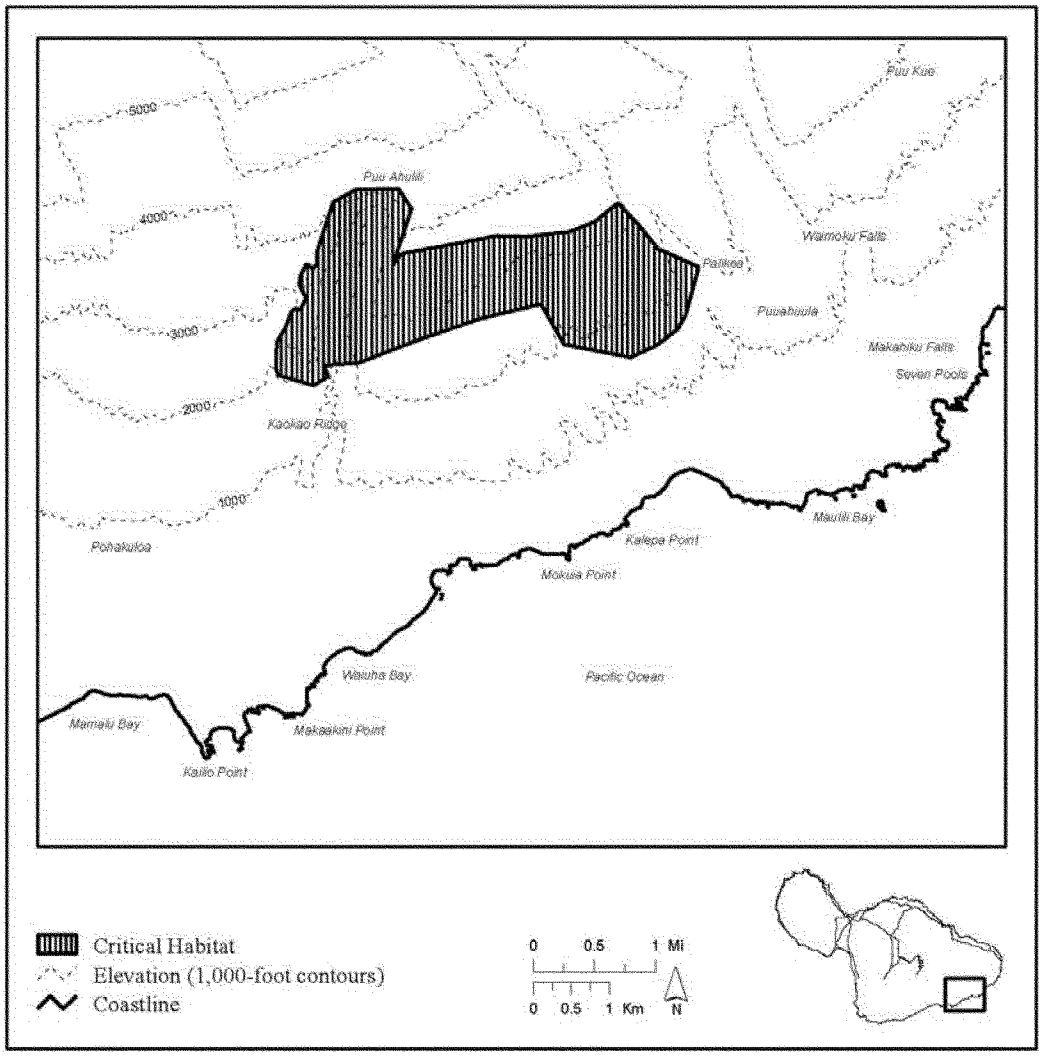
(xii) Maui—Lowland Mesic—Unit 1 (1,930 ac, 781 ha)

(A) [Reserved for textual description of Unit 1.] This unit is critical habitat for *Ctenitis squamigera, Cyanea asplenifolia, Cyanea copelandii* ssp. *haleakalaensis, Huperzia mannii,* and *Solanum incompletum.*

(B) NOTE: Map of Lowland Mesic—Unit 1 (Map 12) follows:

Map 12

Maui–Lowland Mesic Unit 1



(xiii) Maui—Lowland Mesic—Unit 2 (3,424 ac, 1,386 ha) and Maui—Lowland Mesic—Unit 3 (477 ac, 193 ha)

(A) [Reserved for textual description of Unit 2.] This unit is critical habitat for *Asplenium dielerectum, Bidens campylotheca* ssp. *pentamera, Colubrina oppositifolia, Ctenitis squamigera, Remya mauiensis, Santalum haleakalae* var. *lanaiense,* and *Zanthoxylum hawaiiense.*

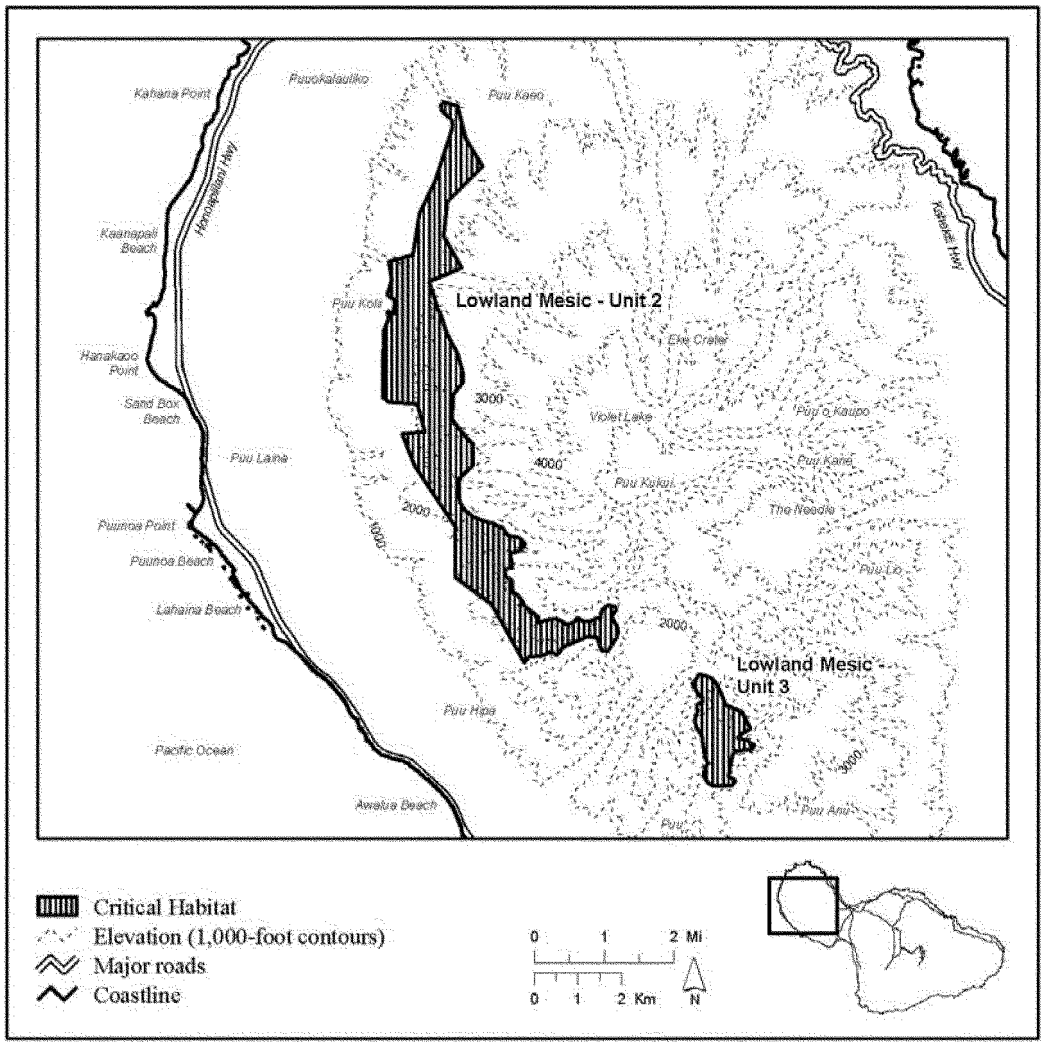
(B) [Reserved for textual description of Unit 3.] This unit is critical habitat for *Asplenium dielerectum, Bidens campylotheca* ssp. *pentamera, Colubrina oppositifolia, Ctenitis squamigera, Remya mauiensis, Santalum haleakalae* var. *lanaiense,* and *Zanthoxylum hawaiiense.*

(C) NOTE: Map of Maui—Lowland Mesic—Unit 2 and Maui—Lowland Mesic—Unit 3 (Map 13) follows:

Map 13

Maui–Lowland Mesic

Unit 2 and Unit 3



(xiv) Maui—Lowland Wet—Unit 1 (26,703 ac, 10,807 ha)

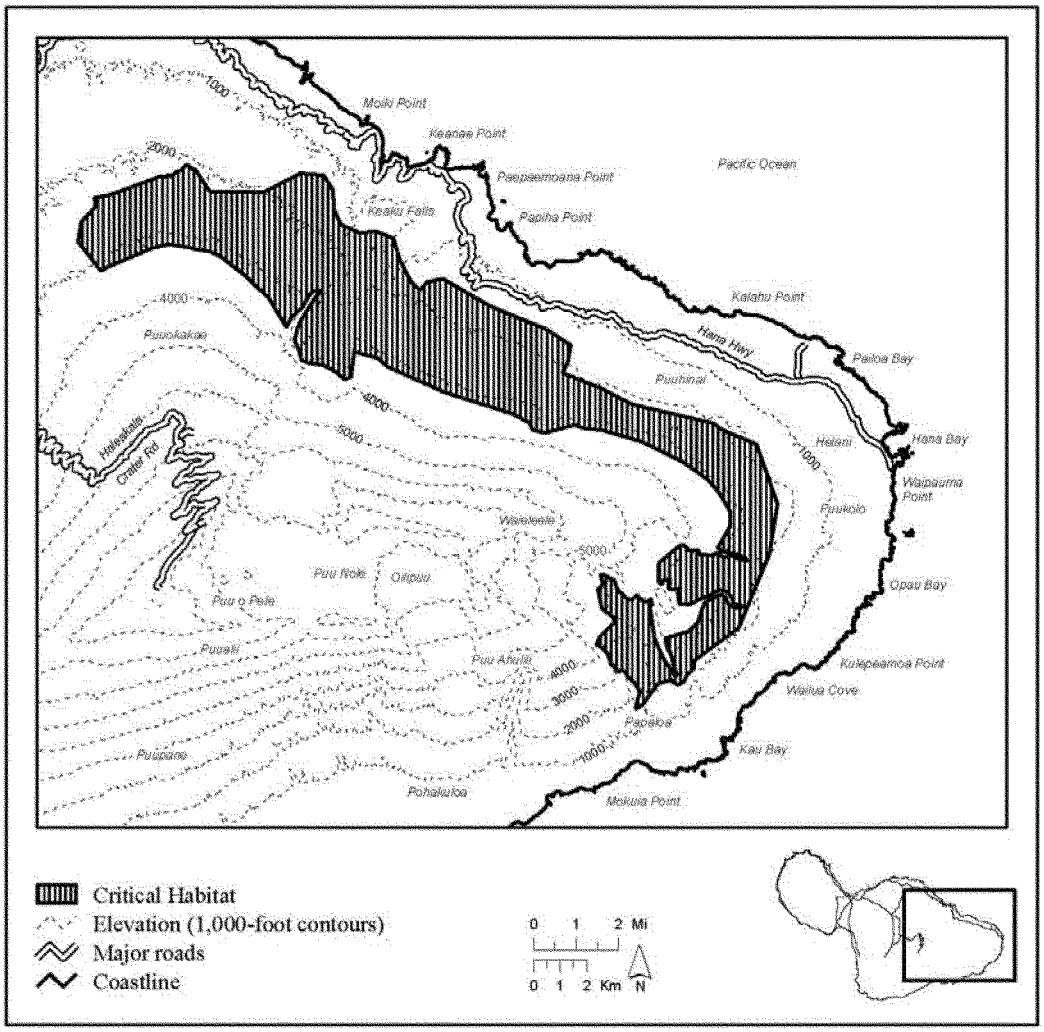
(A) [Reserved for textual description of Unit 1.] This unit is critical habitat for *Bidens campylotheca* ssp. *waihoiensis, Clermontia oblongifolia* ssp. *mauiensis, Clermontia peleana, Clermontia samuelii, Cyanea asplenifolia, Cyanea copelandii* ssp. *haleakalaensis, Cyanea duvalliorum, Cyanea hamatiflora* ssp. *hamatiflora, Cyanea kunthiana, Cyanea maritae, Cyanea mceldowneyi, Huperzia mannii, Melicope balloui, Melicope ovalis, Mucuna sloanei* var. *persericea,* and *Wikstroemia villosa.*

(B) NOTE: Map of Maui—Lowland Wet—Unit 1 (Map 14) follows:

Map 14

Maui–Lowland Wet

Unit 1



(xv) Maui—Lowland Wet—Unit 2 (5,066 ac, 2,050 ha), Maui—Lowland Wet—Unit 3 (1,427 ac, 577 ha), Maui—Lowland Wet—Unit 4 (1,165 ac, 472 ha), and Maui—Lowland Wet—Unit 6 (639 ac, 259 ha)

(A) [Reserved for textual description of Unit 2.] This unit is critical habitat for *Alectryon macrococcus, Asplenium dielerectum, Bidens conjuncta, Bidens micrantha* ssp. *kalealaha, Clermontia oblongifolia* ssp. *mauiensis, Ctenitis squamigera, Cyanea asplenifolia, Cyanea glabra, Cyanea kunthiana, Cyanea lobata, Cyanea magnicalyx, Cyrtandra filipes, Cyrtandra munroi, Diplazium molokaiense, Hesperomannia arborescens, Hesperomannia arbuscula, Huperzia mannii, Isodendrion pyrifolium, Kadua laxiflora, Peucedanum sandwicense, Phyllostegia bracteata, Pteris lidgatei, Remya mauiensis, Santalum haleakalae* var. *lanaiense,* and *Wikstroemia villosa.*

(B) [Reserved for textual description of Unit 3.] This unit is critical habitat for *Alectryon macrococcus, Asplenium dielerectum, Bidens conjuncta, Bidens micrantha* ssp. *kalealaha, Clermontia oblongifolia* ssp. *mauiensis, Ctenitis squamigera, Cyanea asplenifolia, Cyanea glabra, Cyanea kunthiana, Cyanea lobata, Cyanea magnicalyx, Cyrtandra filipes, Cyrtandra munroi, Diplazium molokaiense, Hesperomannia arborescens, Hesperomannia arbuscula, Huperzia mannii, Isodendrion pyrifolium, Kadua laxiflora, Peucedanum sandwicense, Phyllostegia bracteata, Pteris lidgatei, Remya mauiensis, Santalum haleakalae* var. *lanaiense,* and *Wikstroemia villosa.*

(C) [Reserved for textual description of Unit 4.] This unit is critical habitat for *Alectryon macrococcus, Asplenium dielerectum, Bidens conjuncta, Bidens micrantha* ssp. *kalealaha, Clermontia oblongifolia* ssp. *mauiensis, Ctenitis squamigera, Cyanea asplenifolia, Cyanea glabra, Cyanea kunthiana, Cyanea lobata, Cyanea magnicalyx, Cyrtandra filipes, Cyrtandra munroi, Diplazium molokaiense, Hesperomannia arborescens, Hesperomannia arbuscula, Huperzia mannii, Isodendrion pyrifolium, Kadua laxiflora, Peucedanum sandwicense,*

Phyllostegia bracteata, Pteris lidgatei, Remya mauiensis, Santalum haleakalae var. *lanaiense,* and *Wikstroemia villosa.*

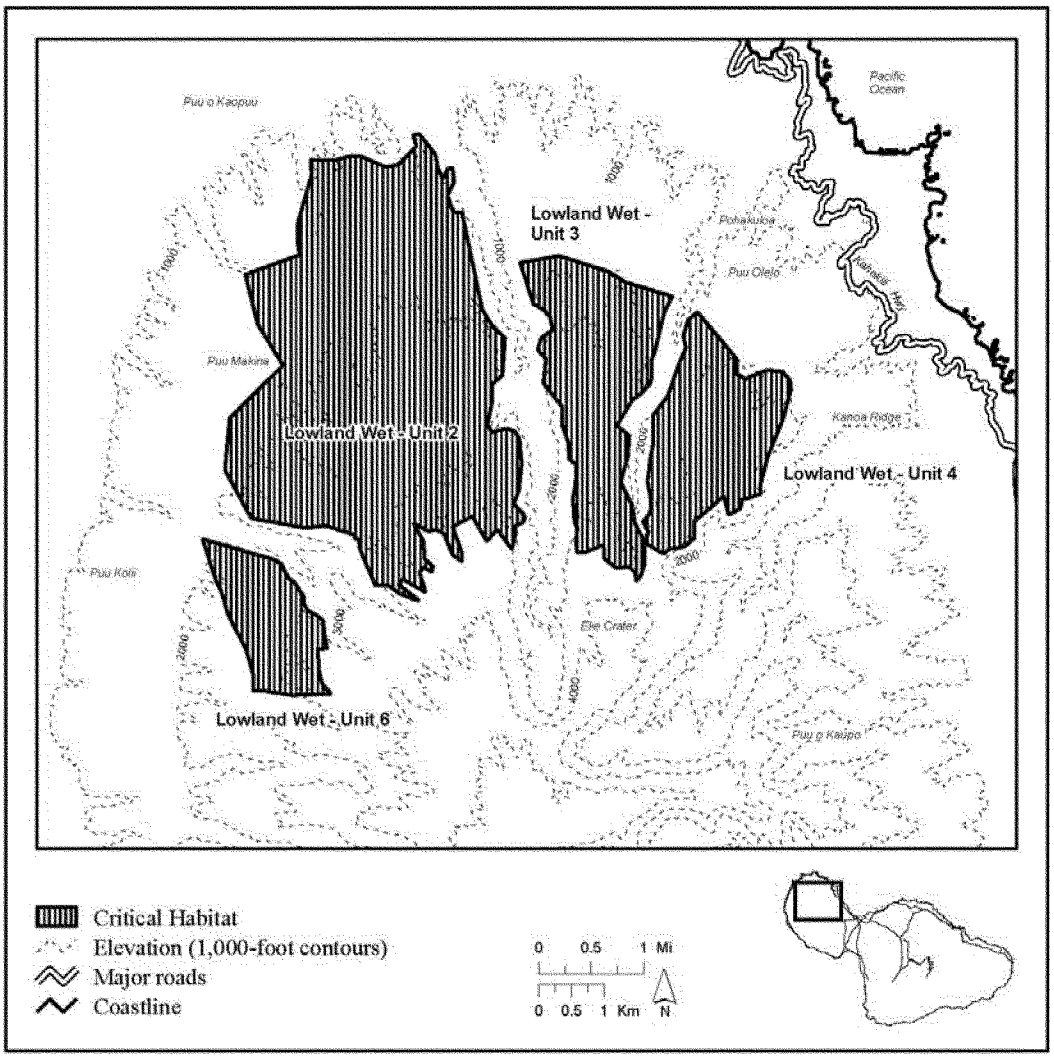
(D) [Reserved for textual description of Unit 6.] This unit is critical habitat for *Alectryon macrococcus, Asplenium dielerectum, Bidens conjuncta, Bidens micrantha* ssp. *kalealaha, Clermontia oblongifolia* ssp. *mauiensis, Ctenitis squamigera, Cyanea asplenifolia, Cyanea glabra, Cyanea kunthiana, Cyanea lobata, Cyanea magnicalyx, Cyrtandra filipes, Cyrtandra munroi, Diplazium molokaiense, Hesperomannia arborescens, Hesperomannia arbuscula, Huperzia mannii, Isodendrion pyrifolium, Kadua laxiflora, Peucedanum sandwicense, Phyllostegia bracteata, Pteris lidgatei, Remya mauiensis, Santalum haleakalae* var. *lanaiense,* and *Wikstroemia villosa.*

(E) NOTE: Map of Maui—Lowland Wet—Unit 2, Maui—Lowland Wet—Unit 3, Maui—Lowland Wet—Unit 4, and Maui—Lowland Wet—Unit 6 (Map 15) follows:

Map 15

Maui–Lowland Wet

Unit 2, Unit 3, Unit 4 and Unit 6



(xvi) Maui—Lowland Wet—Unit 5 (2,112 ac, 855 ha), Maui—Lowland Wet—Unit 7 (898 ac, 364 ha), and Maui—Lowland Wet—Unit 8 (230 ac, 93 ha)

(A) [Reserved for textual description of Unit 5.] This unit is critical habitat for *Alectryon macrococcus, Asplenium dielerectum, Bidens conjuncta, Bidens micrantha* ssp. *kalealaha, Clermontia oblongifolia* ssp. *mauiensis, Ctenitis squamigera, Cyanea asplenifolia, Cyanea glabra, Cyanea kunthiana, Cyanea lobata, Cyanea magnicalyx, Cyrtandra filipes, Cyrtandra munroi, Diplazium molokaiense, Hesperomannia arborescens, Hesperomannia arbuscula, Huperzia mannii, Isodendrion pyrifolium, Kadua laxiflora, Peucedanum sandwicense, Phyllostegia bracteata, Pteris lidgatei,*

Remya mauiensis, Santalum haleakalae var. *lanaiense,* and *Wikstroemia villosa.*

(B) [Reserved for textual description of Unit 7.] This unit is critical habitat for *Alectryon macrococcus, Asplenium dielerectum, Bidens conjuncta, Bidens micrantha* ssp. *kalealaha, Clermontia oblongifolia* ssp. *mauiensis, Ctenitis squamigera, Cyanea asplenifolia, Cyanea glabra, Cyanea kunthiana, Cyanea lobata, Cyanea magnicalyx, Cyrtandra filipes, Cyrtandra munroi, Diplazium molokaiense, Hesperomannia arborescens, Hesperomannia arbuscula, Huperzia mannii, Isodendrion pyrifolium, Kadua laxiflora, Peucedanum sandwicense, Phyllostegia bracteata, Pteris lidgatei, Remya mauiensis, Santalum haleakalae* var. *lanaiense,* and *Wikstroemia villosa.*

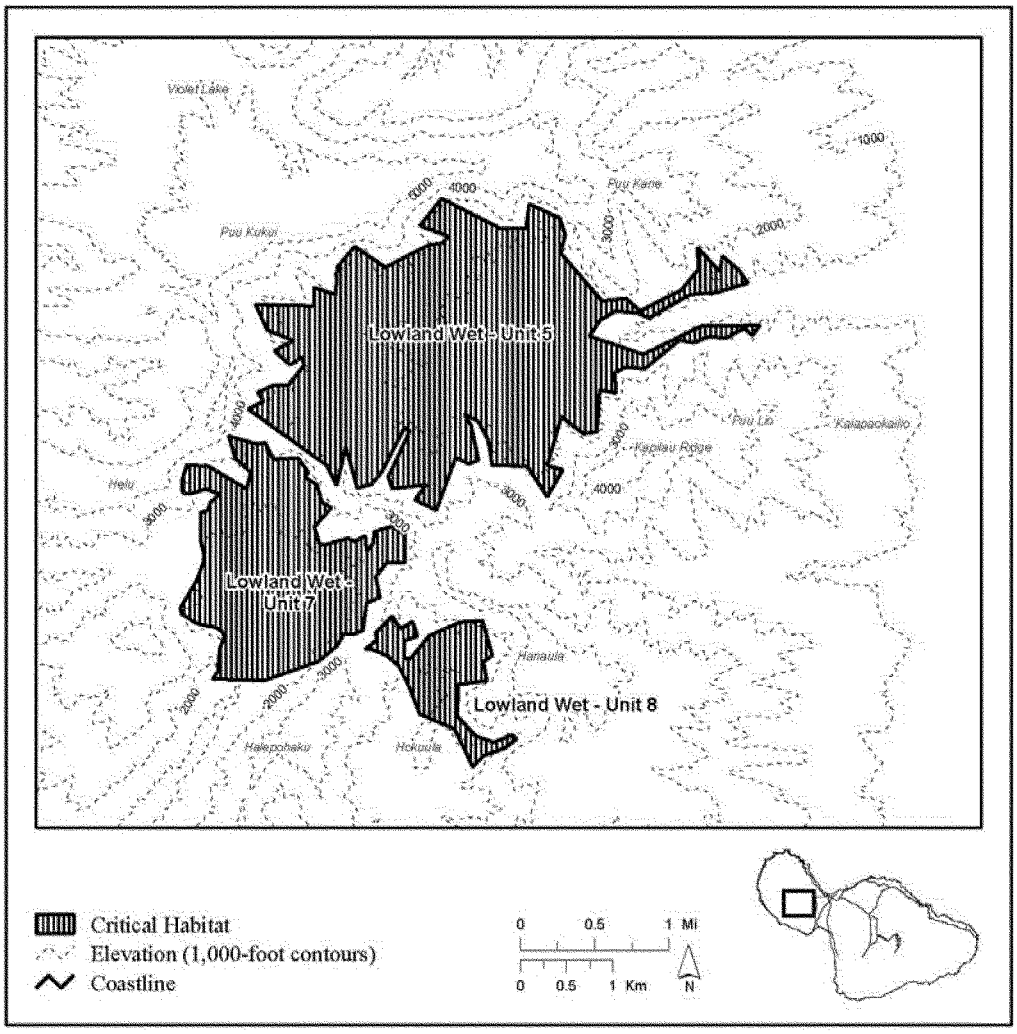
(C) [Reserved for textual description of Unit 8.] This unit is critical habitat for *Alectryon macrococcus, Asplenium dielerectum, Bidens conjuncta, Bidens micrantha* ssp. *kalealaha, Clermontia oblongifolia* ssp. *mauiensis, Ctenitis squamigera, Cyanea asplenifolia, Cyanea glabra, Cyanea kunthiana, Cyanea lobata, Cyanea magnicalyx, Cyrtandra filipes, Cyrtandra munroi, Diplazium molokaiense, Hesperomannia arborescens, Hesperomannia arbuscula, Huperzia mannii, Isodendrion pyrifolium, Kadua laxiflora, Peucedanum sandwicense, Phyllostegia bracteata, Pteris lidgatei, Remya mauiensis, Santalum haleakalae* var. *lanaiense,* and *Wikstroemia villosa.*

(D) NOTE: Map of Maui—Lowland Wet—Unit 5, Maui—Lowland Wet—Unit 7, and Maui—Lowland Wet—Unit 8 (Map 16) follows:

Map 16

Maui–Lowland Wet

Unit 5, Unit 7 and Unit 8



(xvii) Maui—Montane Wet—Unit 1 (7,815 ac, 3,162 ha), Maui—Montane Wet—Unit 2 (16,687 ac, 6,753 ha), Maui—Montane Wet—Unit 3 (2,228 ac, 902 ha), Maui—Montane Wet—Unit 4 (1,833 ac, 742 ha), and Maui—Montane Wet—Unit 5 (387 ac, 156 ha)

(A) [Reserved for textual description of Unit 1.] This unit is critical habitat for *Adenophorus periens, Asplenium peruvianum* var. *insulare, Bidens campylotheca* ssp. *pentamera, Bidens camylotheca* ssp. *waihoiensis, Clermontia oblongifolia* ssp. *mauiensis, Clermontia samuelii, Cyanea copelandii* ssp. *haleakalaensis, Cyanea duvalliorum, Cyanea glabra, Cyanea hamatiflora* ssp. *hamatiflora, Cyanea horrida, Cyanea kunthiana, Cyanea maritae, Cyanea mceldowneyi, Cyrtandra ferripilosa, Diplazium molokaiense, Geranium hanaense, Geranium multiflorum, Huperzia mannii, Melicope balloui, Melicope ovalis, Peperomia subpetiolata, Phyllostegia bracteata, Phyllostegia mannii, Phyllostegia pilosa, Platanthera holochila, Schiedea jacobii,* and *Wikstroemia villosa.*

(B) [Reserved for textual description of Unit 2.] This unit is critical habitat for *Adenophorus periens, Asplenium peruvianum* var. *insulare, Bidens campylotheca* ssp. *pentamera, Bidens camylotheca* ssp. *waihoiensis, Clermontia oblongifolia* ssp. *mauiensis, Clermontia samuelii, Cyanea copelandii* ssp. *haleakalaensis, Cyanea duvalliorum, Cyanea glabra, Cyanea hamatiflora* ssp. *hamatiflora, Cyanea horrida, Cyanea kunthiana, Cyanea maritae, Cyanea mceldowneyi, Cyrtandra ferripilosa, Diplazium molokaiense, Geranium hanaense, Geranium multiflorum, Huperzia mannii, Melicope balloui, Melicope ovalis, Peperomia subpetiolata, Phyllostegia bracteata, Phyllostegia mannii, Phyllostegia pilosa, Platanthera holochila, Schiedea jacobii,* and *Wikstroemia villosa.*

(C) [Reserved for textual description of Unit 3.] This unit is critical habitat for *Adenophorus periens, Asplenium peruvianum* var. *insulare, Bidens campylotheca* ssp. *pentamera, Bidens camylotheca* ssp. *waihoiensis, Clermontia oblongifolia* ssp. *mauiensis, Clermontia samuelii, Cyanea copelandii* ssp. *haleakalaensis, Cyanea duvalliorum, Cyanea glabra, Cyanea hamatiflora* ssp. *hamatiflora, Cyanea horrida, Cyanea kunthiana, Cyanea maritae, Cyanea mceldowneyi, Cyrtandra ferripilosa, Diplazium molokaiense, Geranium hanaense, Geranium multiflorum, Huperzia mannii, Melicope balloui, Melicope ovalis, Peperomia subpetiolata, Phyllostegia bracteata, Phyllostegia mannii, Phyllostegia pilosa, Platanthera holochila, Schiedea jacobii,* and *Wikstroemia villosa.*

(D) [Reserved for textual description of Unit 4.] This unit is critical habitat for *Adenophorus periens, Asplenium peruvianum* var. *insulare, Bidens campylotheca* ssp. *pentamera, Bidens camylotheca* ssp. *waihoiensis, Clermontia oblongifolia* ssp. *mauiensis, Clermontia samuelii, Cyanea copelandii* ssp. *haleakalaensis, Cyanea duvalliorum, Cyanea glabra, Cyanea hamatiflora* ssp. *hamatiflora, Cyanea horrida, Cyanea kunthiana, Cyanea maritae, Cyanea mceldowneyi, Cyrtandra ferripilosa, Diplazium molokaiense, Geranium hanaense, Geranium multiflorum, Huperzia mannii, Melicope balloui, Melicope ovalis, Peperomia subpetiolata, Phyllostegia bracteata, Phyllostegia mannii, Phyllostegia pilosa, Platanthera holochila, Schiedea jacobii,* and *Wikstroemia villosa.*

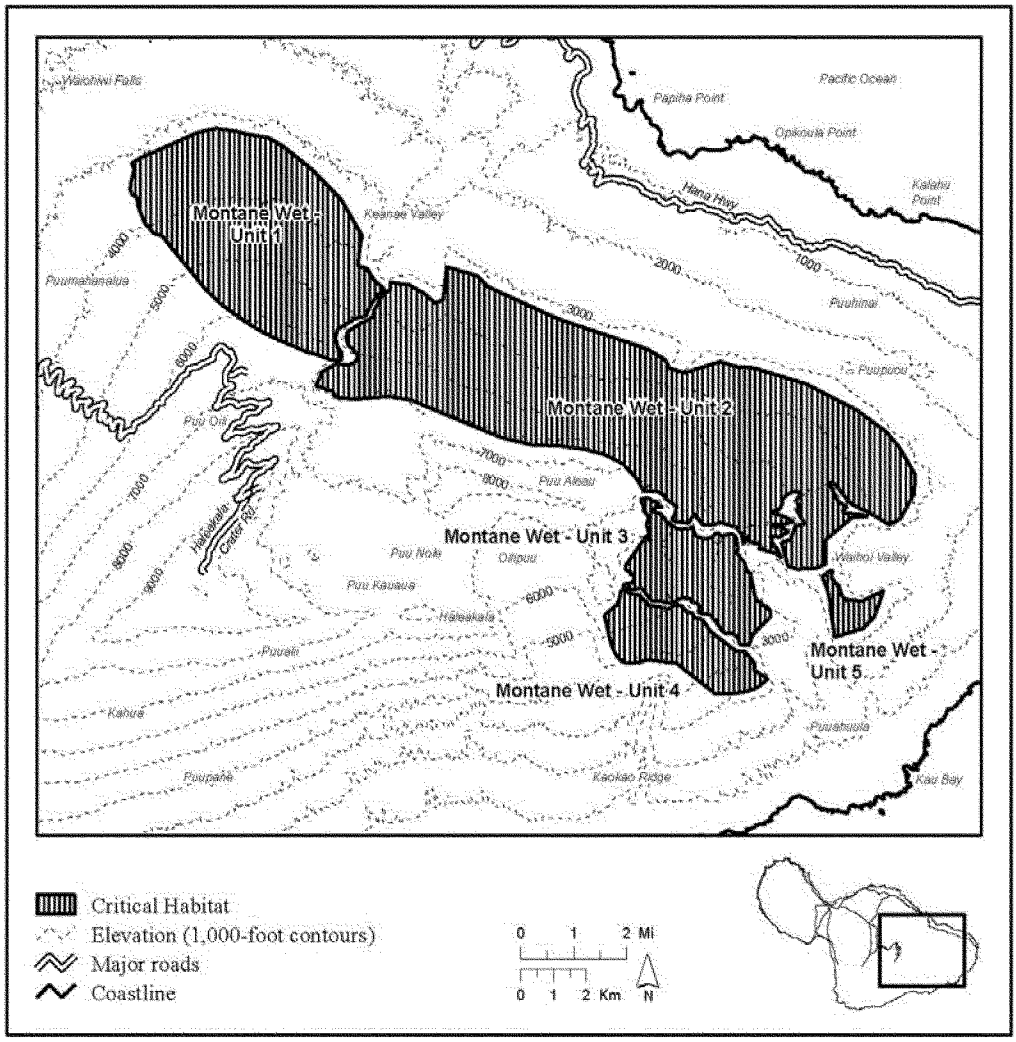
(E) [Reserved for textual description of Unit 5.] This unit is critical habitat for *Adenophorus periens, Asplenium peruvianum* var. *insulare, Bidens campylotheca* ssp. *pentamera, Bidens camylotheca* ssp. *waihoiensis, Clermontia oblongifolia* ssp. *mauiensis, Clermontia samuelii, Cyanea copelandii* ssp. *haleakalaensis, Cyanea duvalliorum, Cyanea glabra, Cyanea hamatiflora* ssp. *hamatiflora, Cyanea horrida, Cyanea kunthiana, Cyanea maritae, Cyanea mceldowneyi, Cyrtandra ferripilosa, Diplazium molokaiense, Geranium hanaense, Geranium multiflorum, Huperzia mannii, Melicope balloui, Melicope ovalis, Peperomia subpetiolata, Phyllostegia bracteata, Phyllostegia mannii, Phyllostegia pilosa, Platanthera holochila, Schiedea jacobii,* and *Wikstroemia villosa.*

(F) NOTE: Map of Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2, Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, and Maui—Montane Wet—Unit 5 (Map 17) follows:

Map 17

Maui–Montane Wet

Unit 1, Unit 2, Unit 3, Unit 4 and Unit 5



(xviii) Maui—Montane Wet—Unit 6 (3,964 ac, 1,604 ha), Maui—Montane Wet—Unit 7 (608 ac, 246 ha), and Maui—Montane Wet—Unit 8 (46 ac, 19 ha)

(A) [Reserved for textual description of Unit 6.] This unit is critical habitat for *Acaena exigua, Bidens conjuncta, Calamagrostis hillebrandii, Cyanea kunthiana, Cyrtandra oxybapha, Geranium hillebrandii, Huperzia mannii, Myrsine vaccinioides, Phyllostegia bracteata, Platanthera holochila,* and *Sanicula purpurea.*

(B) [Reserved for textual description of Unit 7.] This unit is critical habitat for *Acaena exigua, Bidens conjuncta, Calamagrostis hillebrandii, Cyanea kunthiana, Cyrtandra oxybapha, Geranium hillebrandii, Huperzia mannii, Myrsine vaccinioides, Phyllostegia bracteata, Platanthera holochila,* and *Sanicula purpurea.*

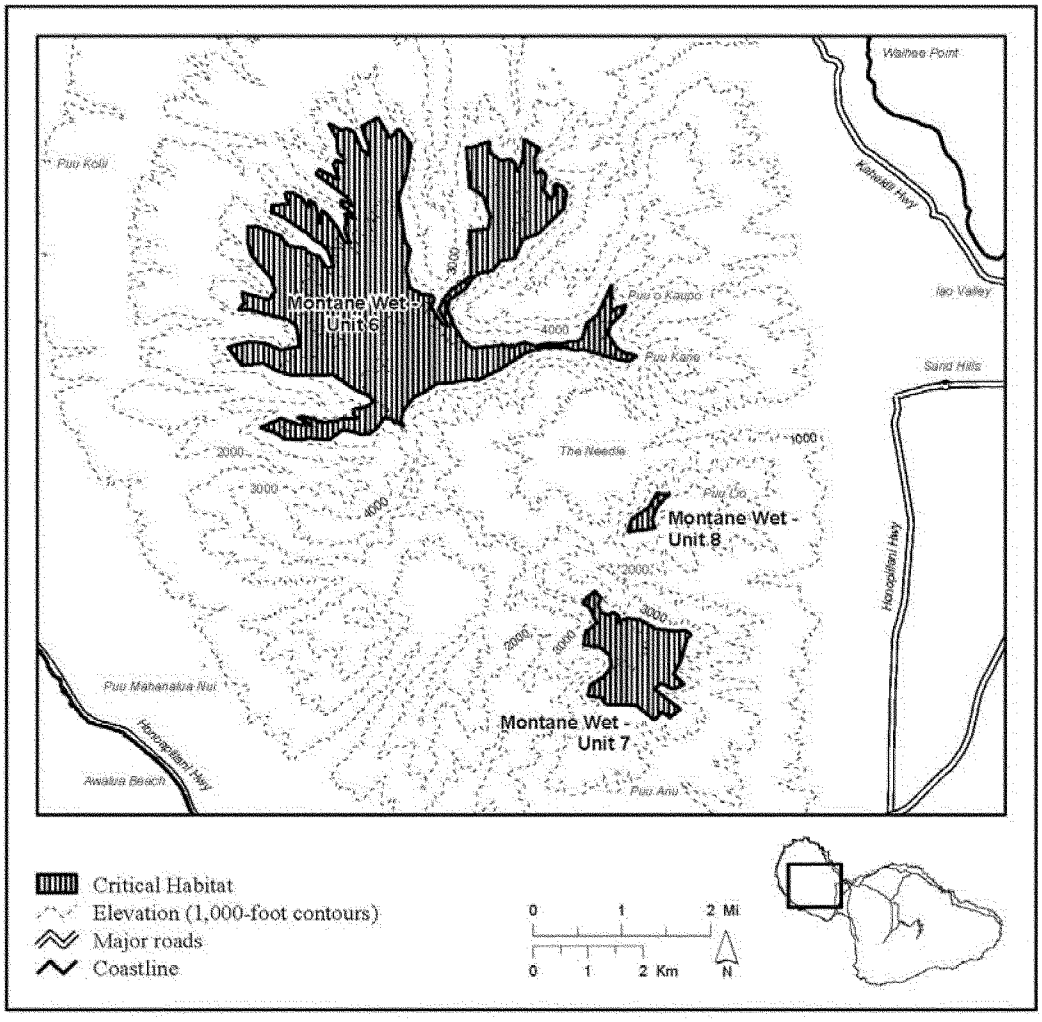
(C) [Reserved for textual description of Unit 8.] This unit is critical habitat for *Acaena exigua, Bidens conjuncta, Calamagrostis hillebrandii, Cyanea kunthiana, Cyrtandra oxybapha, Geranium hillebrandii, Huperzia mannii, Myrsine vaccinioides, Phyllostegia bracteata, Platanthera holochila,* and *Sanicula purpurea.*

(D) NOTE: Map of Maui—Montane Wet—Unit 6, Maui—Montane Wet—Unit 7, and Maui—Montane Wet—Unit 8 (Map 18) follows:

Map 18

Maui–Montane Wet

Unit 6, Unit 7 and Unit 8



(xix) Maui—Montane Mesic—Unit 1 (20,972 ac, 8,487 ha)

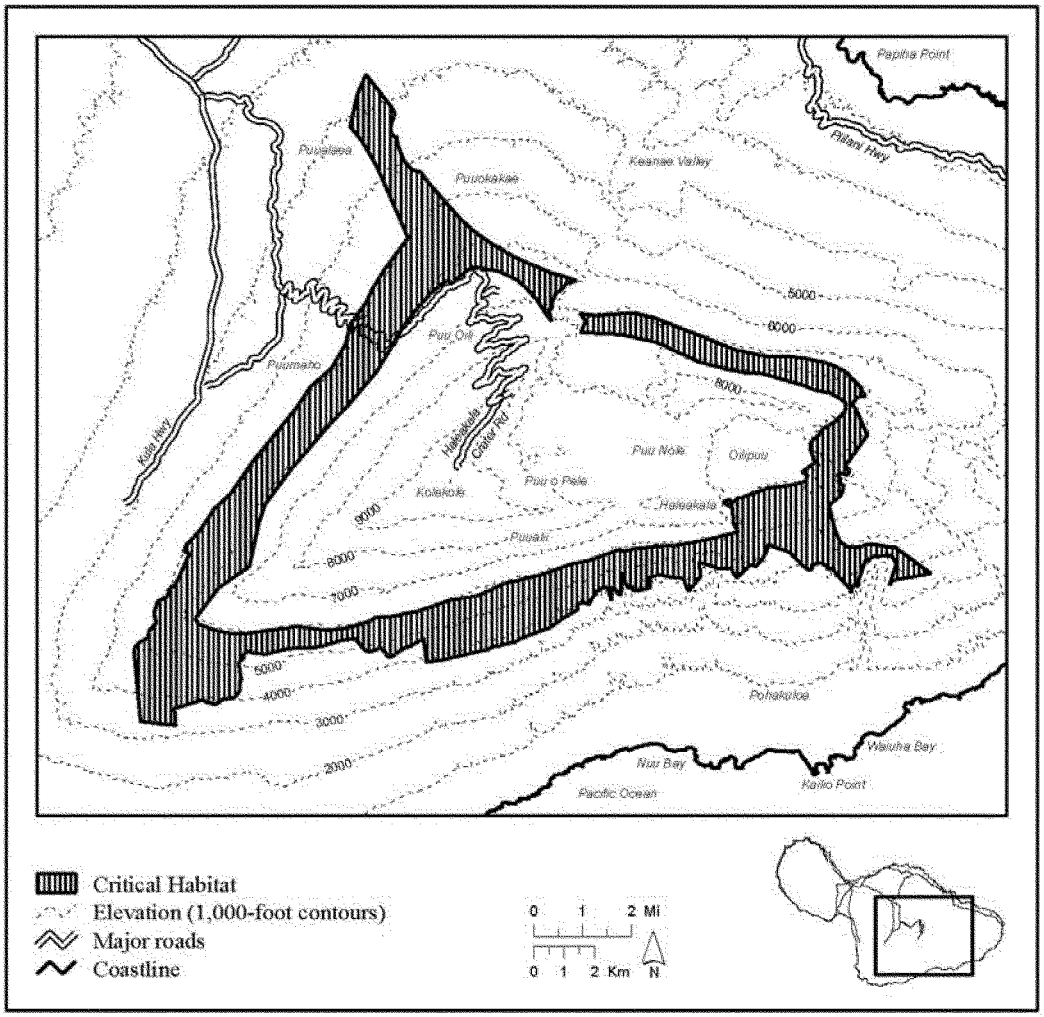
(A) [Reserved for textual description of Unit 1.] This unit is critical habitat for *Alectryon macrococcus, Argyroxiphium sandwicense* ssp. *macrocephalum, Asplenium dielerectum, Asplenium peruvianum* var. *insulare, Bidens campylotheca* ssp. *pentamera, Bidens micrantha* ssp. *kalealaha, Clermontia lindseyana, Cyanea glabra, Cyanea hamatiflora* ssp. *hamatiflora, Cyanea horrida, Cyanea kunthiana, Cyanea mceldowneyi, Cyanea obtusa, Cyrtandra ferripilosa, Cyrtandra oxybapha, Diplazium molokaiense, Geranium arboreum, Geranium multiflorum, Huperzia mannii, Melicope adscendens, Neraudia sericea, Phyllostegia bracteata, Phyllostegia mannii, Santalum haleakalae* var. *lanaiense, Wikstroemia villosa,* and *Zanthoxylum hawaiiense.*

(B) NOTE: Map of Maui—Montane Mesic—Unit 1 (Map 19) follows:

Map 19

Maui–Montane Mesic

Unit 1



(xx) Maui—Montane Mesic—Unit 2 (366 ac, 148 ha), Maui—Montane Mesic—Unit 3 (218 ac; 88 ha), Maui—Montane Mesic—Unit 4 (72 ac, 29 ha), Maui—Montane Mesic—Unit 5 (304 ac, 123 ha), and Maui—Montane Mesic—Unit 6 (94 ac, 38 ha)

(A) [Reserved for textual description of Unit 2.] This unit is critical habitat for *Ctenitis squamigera, Cyanea magnicalyx, Diplazium molokaiense, Geranium hillebrandii, Huperzia mannii, Lysimachia lydgatei, Remya mauiensis, Santalum haleakalae* var. *lanaiense, Stenogyne kauaulaensis,* and *Zanthoxylum hawaiiense.*

(B) [Reserved for textual description of Unit 3.] This unit is critical habitat for *Ctenitis squamigera, Cyanea magnicalyx, Diplazium molokaiense, Geranium hillebrandii, Huperzia mannii, Lysimachia lydgatei, Remya mauiensis, Santalum haleakalae* var. *lanaiense, Stenogyne kauaulaensis,* and *Zanthoxylum hawaiiense.*

(C) [Reserved for textual description of Unit 4.] This unit is critical habitat for *Ctenitis squamigera, Cyanea magnicalyx, Diplazium molokaiense, Geranium hillebrandii, Huperzia mannii, Lysimachia lydgatei, Remya mauiensis, Santalum haleakalae* var. *lanaiense, Stenogyne kauaulaensis,* and *Zanthoxylum hawaiiense.*

(D) [Reserved for textual description of Unit 5.] This unit is critical habitat for *Ctenitis squamigera, Cyanea magnicalyx, Diplazium molokaiense, Geranium hillebrandii, Huperzia mannii, Lysimachia lydgatei, Remya mauiensis, Santalum haleakalae* var. *lanaiense, Stenogyne kauaulaensis,* and *Zanthoxylum hawaiiense.*

(E) [Reserved for textual description of Unit 6.] This unit is critical habitat for *Ctenitis squamigera, Cyanea magnicalyx, Diplazium molokaiense, Geranium hillebrandii, Huperzia mannii, Lysimachia lydgatei, Remya mauiensis, Santalum haleakalae* var. *lanaiense, Stenogyne kauaulaensis,* and *Zanthoxylum hawaiiense.*

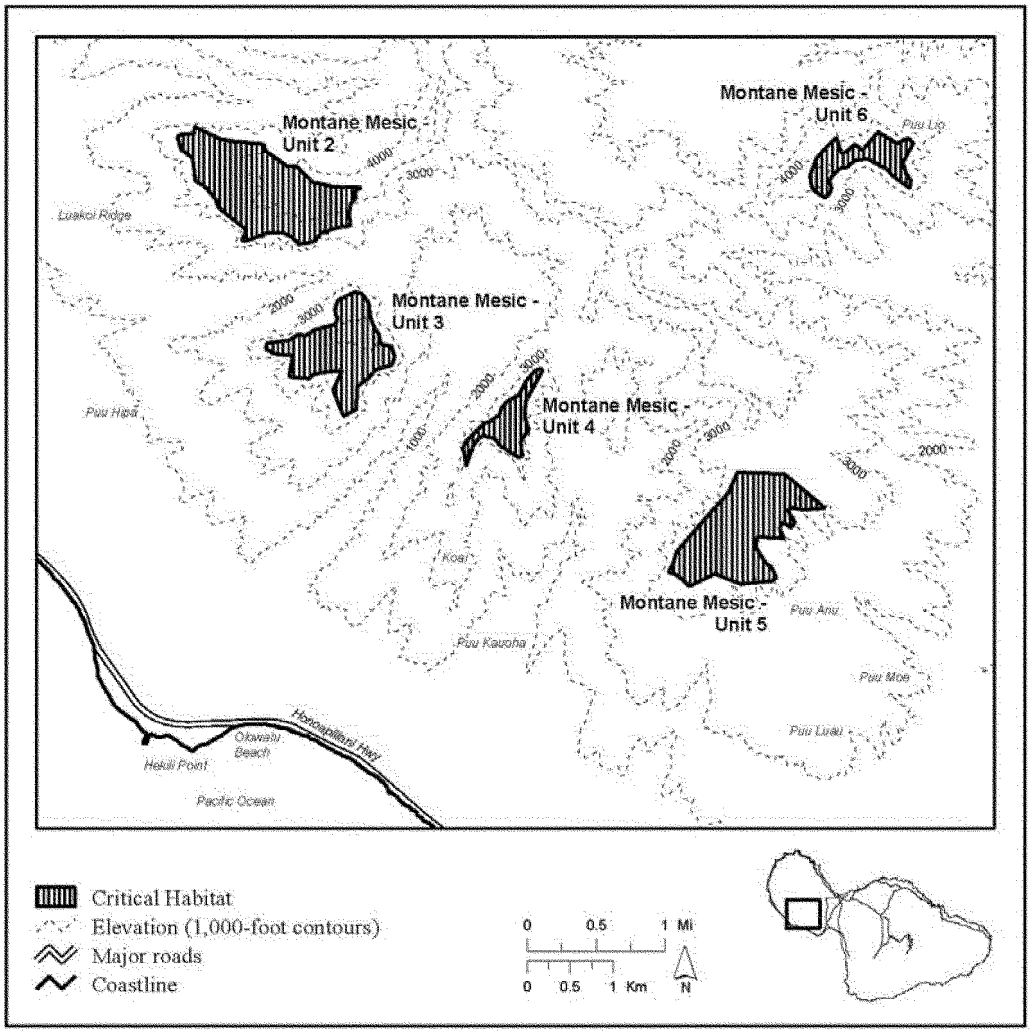
(F) NOTE: Map of Maui—Montane Mesic—Unit 2, Maui—Montane Mesic—

Unit 3, Maui—Montane Mesic—Unit 4, Maui—Montane Mesic—Unit 5, and Maui—Montane Mesic—Unit 6 (Map 20) follows:

Map 20

Maui–Montane Mesic

Unit 2, Unit 3, Unit 4, Unit 5 and Unit 6



(xxi) Maui—Montane Dry—Unit 1 (4,988 ac, 2,019 ha)

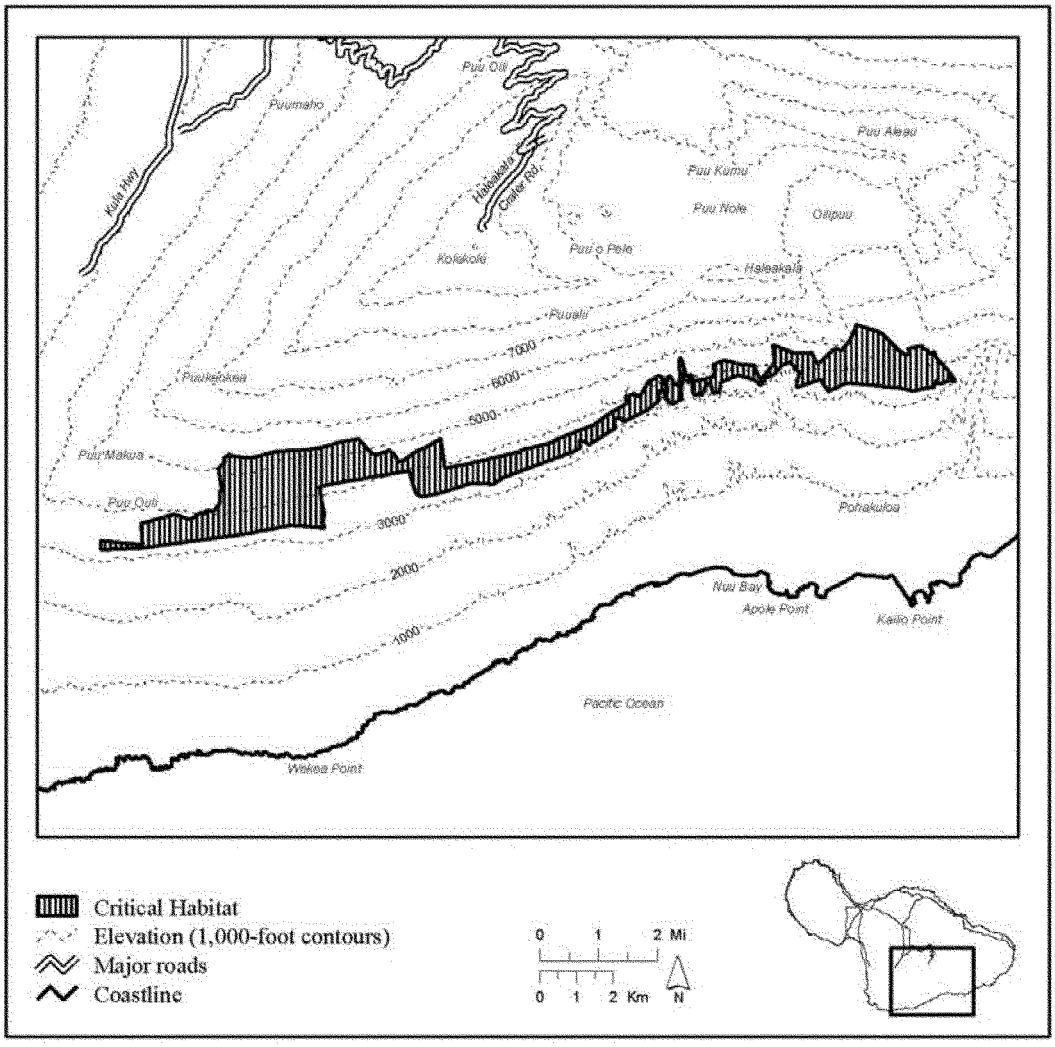
(A) [Reserved for textual description of Unit 1.] This unit is critical habitat for *Alectryon macrococcus, Geranium arboreum, Melicope knudsenii, Melicope mucronulata, Santalum haleakalae* var. *lanaiense,* and *Zanthoxylum hawaiiense.*

(B) NOTE: Map of Maui—Montane Dry—Unit 1 (Map 21) follows:

Map 21

Maui–Montane Dry

Unit 1



(xxii) Maui—Subalpine—Unit 1 (19,401 ac, 7,851 ha) and Maui—Subalpine—Unit 2 (10,931 ac, 4,424 ha)

(A) [Reserved for textual description of Unit 1.] This unit is critical habitat for *Argyroxiphium sandwicense* ssp. *macrocephalum, Asplenium peruvianum* var. *insulare, Bidens micrantha* ssp. *kalealaha, Geranium arboreum, Geranium multiflorum, Phyllostegia bracteata, Schiedea haleakalensis, Solanum incompletum,* and *Zanthoxylum hawaiiense*.

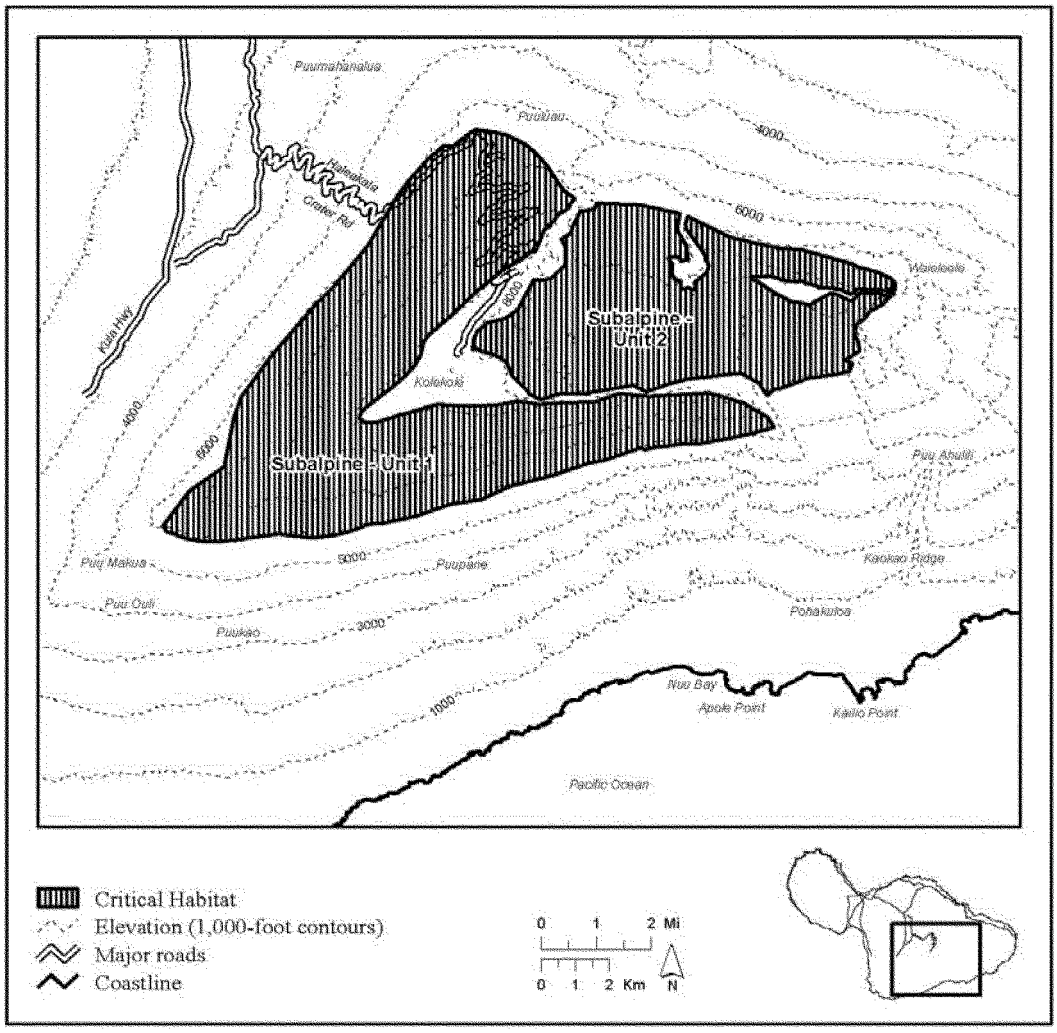
(B) [Reserved for textual description of Unit 2.] This unit is critical habitat for *Argyroxiphium sandwicense* ssp. *macrocephalum, Asplenium peruvianum* var. *insulare, Bidens micrantha* ssp. *kalealaha, Geranium arboreum, Geranium multiflorum, Phyllostegia bracteata, Schiedea haleakalensis, Solanum incompletum,* and *Zanthoxylum hawaiiense*.

(C) NOTE: Map of Maui—Subalpine—Unit 1 and Maui—Subalpine—Unit 2 (Map 22) follows:

Map 22

Maui–Subalpine

Unit 1 and Unit 2



(xxiii) Maui—Alpine—Unit 1 (2,107 ac, 853 ha)

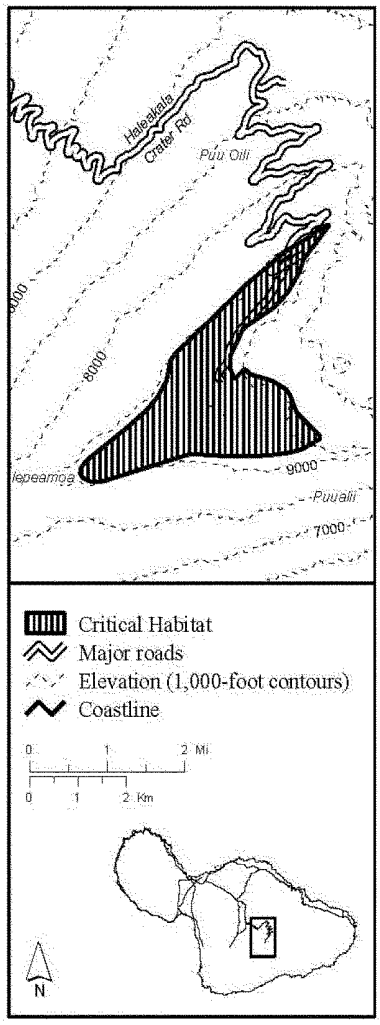
(A) [Reserved for textual description of Unit 1.] This unit is critical habitat for *Argyroxiphium sandwicense* ssp. *macrocephalum*.

(B) NOTE: Map of Maui—Alpine—Unit 1 (Map 23) follows:

Map 23

Maui–Alpine

Unit 1



(xxiv) Maui—Dry Cliff—Unit 1 (1,018 ac, 412 ha), Maui—Dry Cliff—Unit 2 (688 ac, 279 ha), Maui—Dry Cliff—Unit 3 (293 ac, 119 ha), and Maui—Dry Cliff—Unit 4 (315 ac, 127 ha)

(A) [Reserved for textual description of Unit 1.] This unit is critical habitat for *Bidens campylotheca* ssp. *pentamera, Diplazium molokaiense, Plantago princeps,* and *Schiedea haleakalensis.*

(B) [Reserved for textual description of Unit 2.] This unit is critical habitat for *Bidens campylotheca* ssp. *pentamera, Diplazium molokaiense, Plantago princeps,* and *Schiedea haleakalensis.*

(C) [Reserved for textual description of Unit 3.] This unit is critical habitat for *Bidens campylotheca* ssp. *pentamera, Diplazium molokaiense, Plantago princeps,* and *Schiedea haleakalensis.*

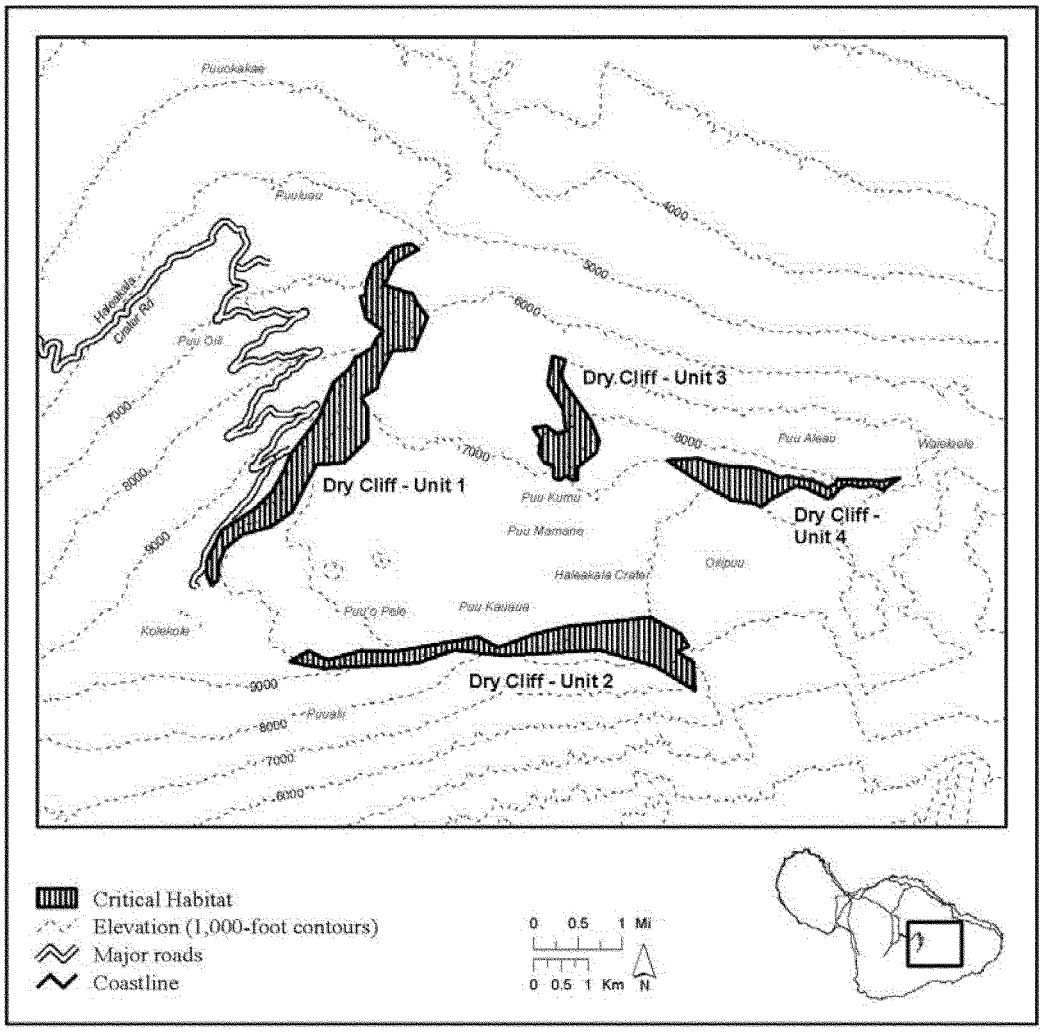
(D) [Reserved for textual description of Unit 4.] This unit is critical habitat for *Bidens campylotheca* ssp. *pentamera, Diplazium molokaiense, Plantago princeps,* and *Schiedea haleakalensis.*

(E) NOTE: Map of Maui—Dry Cliff—Unit 1, Maui—Dry Cliff—Unit 2, Maui—Dry Cliff—Unit 3, and Maui—Dry Cliff—Unit 4 (Map 24) follows:

Map 24

Maui–Dry Cliff

Unit 1, Unit 2, Unit 3 and Unit 4



(xxv) Maui—Dry Cliff—Unit 5 (1,536 ac, 622 ha), Maui—Dry Cliff—Unit 6 (279 ac, 113 ha), and Maui—Dry Cliff—Unit 7 (808 ac, 327 ha)

(A) [Reserved for textual description of Unit 5.] This unit is critical habitat for *Bonamia menziesii, Diplazium molokaiense, Hesperomannia arbuscula, Isodendrion pyrifolium, Kadua laxiflora, Neraudia sericea,* and *Tetramolopium capillare.*

(B) [Reserved for textual description of Unit 6.] This unit is critical habitat for *Bonamia menziesii, Diplazium molokaiense, Hesperomannia arbuscula, Isodendrion pyrifolium, Kadua laxiflora, Neraudia sericea,* and *Tetramolopium capillare.*

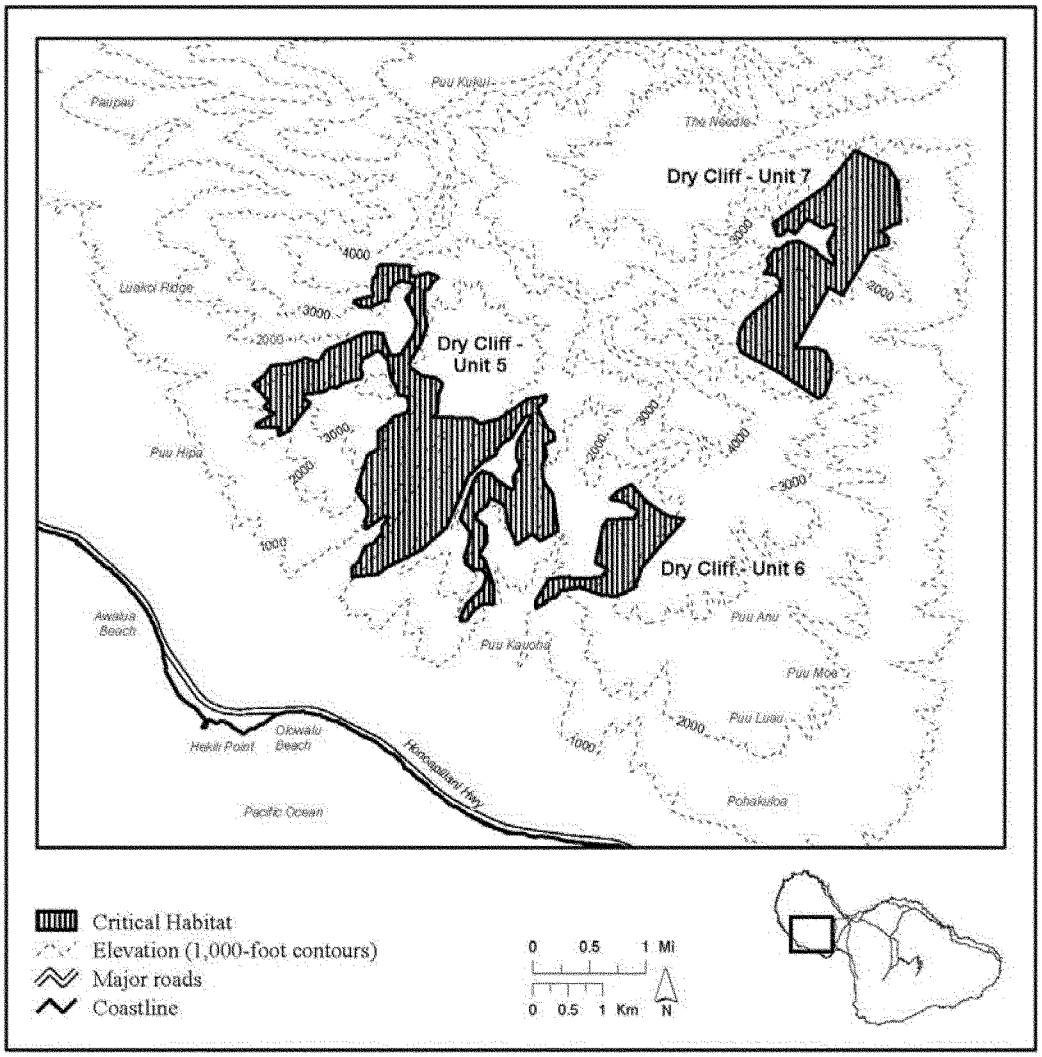
(C) [Reserved for textual description of Unit 7.] This unit is critical habitat for *Bonamia menziesii, Diplazium molokaiense, Hesperomannia arbuscula, Isodendrion pyrifolium, Kadua laxiflora, Neraudia sericea,* and *Tetramolopium capillare.*

(D) NOTE: Map of Maui—Dry Cliff—Unit 5, Maui—Dry Cliff—Unit 6, and Maui—Dry Cliff—Unit 7 (Map 25) follows:

Map 25

Maui–Dry Cliff

Unit 5, Unit 6 and Unit 7



(xxvi) Maui—Wet Cliff—Unit 1 (460 ac, 186 ha)

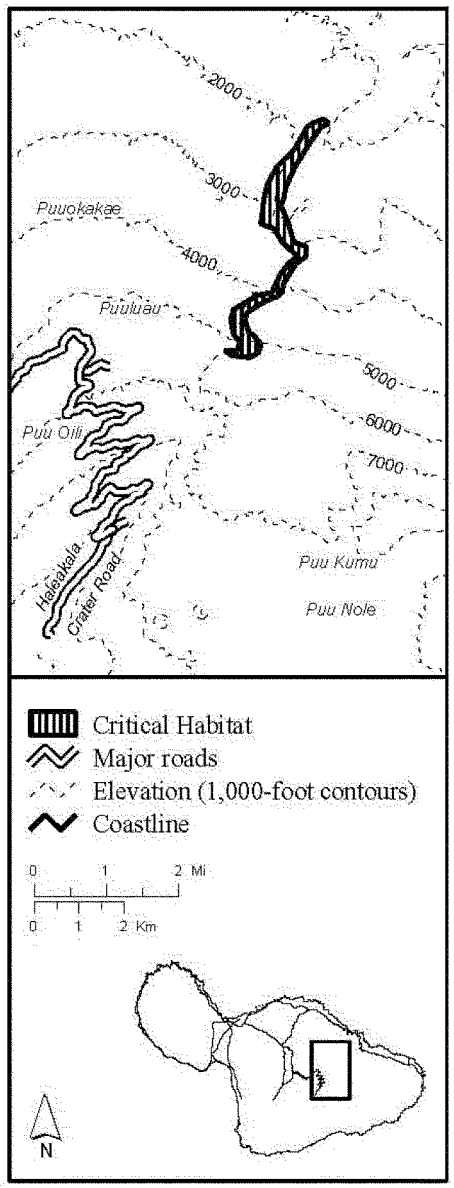
(A) [Reserved for textual description of Unit 1.] This unit is critical habitat for *Bidens campylotheca* ssp. *pentamera, Bidens campylotheca* ssp. *waihoiensis, Cyanea copelandii* ssp. *haleakalaensis, Cyanea horrida, Melicope ovalis, Phyllostegia bracteata, Phyllostegia haliakalae,* and *Plantago princeps.*

(B) NOTE: Map of Maui—Wet Cliff—Unit 1 (Map 26) follows:

Map 26

Maui–Wet Cliff

Unit 1



(xxvii) Maui—Wet Cliff—Unit 2 (1,407 ac, 569 ha), Maui—Wet Cliff—Unit 3 (438 ac, 177 ha), and Maui—Wet Cliff—Unit 4 (184 ac, 75 ha)

(A) [Reserved for textual description of Unit 2.] This unit is critical habitat for *Bidens campylotheca* ssp. *pentamera, Bidens campylotheca* ssp. *waihoiensis, Cyanea copelandii* ssp. *haleakalaensis, Cyanea horrida, Melicope ovalis, Phyllostegia bracteata, Phyllostegia haliakalae,* and *Plantago princeps.*

(B) [Reserved for textual description of Unit 3.] This unit is critical habitat for *Bidens campylotheca* ssp. *pentamera, Bidens campylotheca* ssp. *waihoiensis, Cyanea copelandii* ssp. *haleakalaensis, Cyanea horrida, Melicope ovalis, Phyllostegia bracteata, Phyllostegia haliakalae,* and *Plantago princeps.*

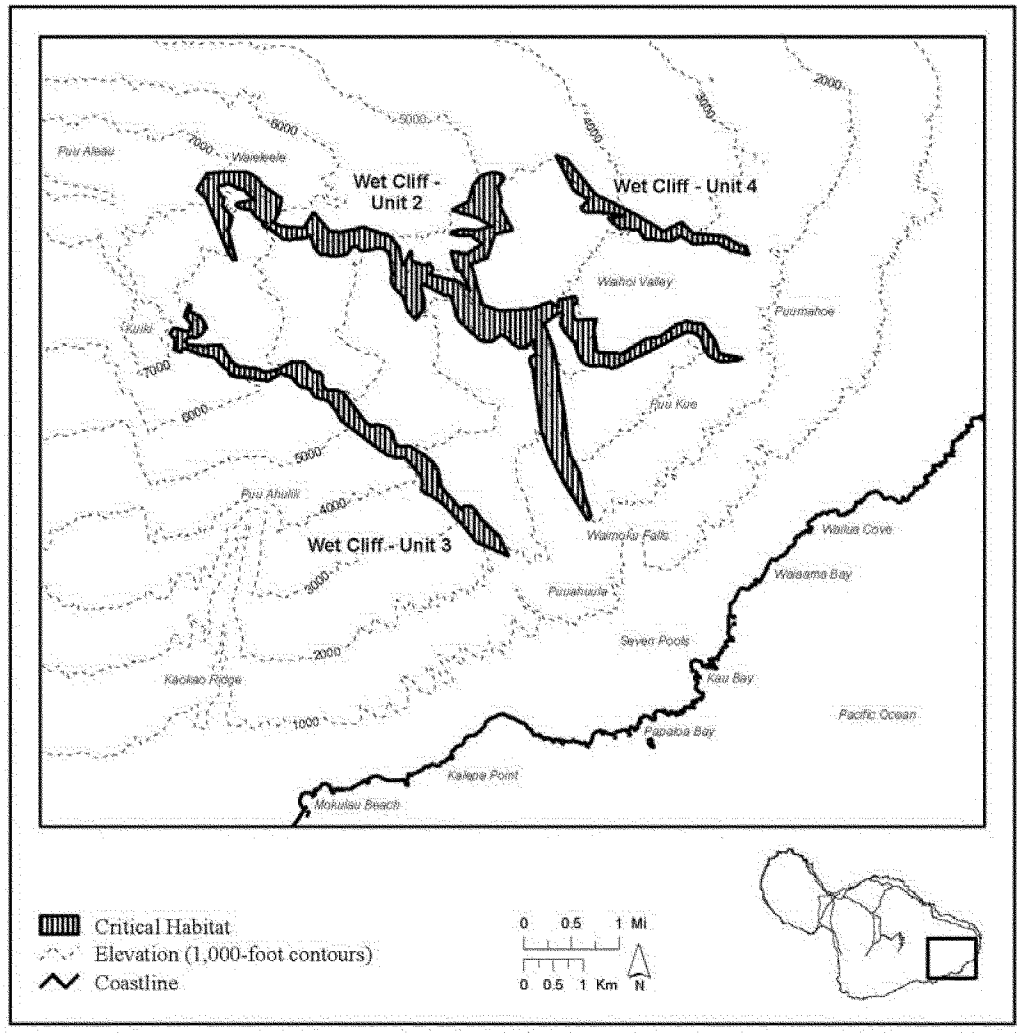
(C) [Reserved for textual description of Unit 4.] This unit is critical habitat for *Bidens campylotheca* ssp. *pentamera, Bidens campylotheca* ssp. *waihoiensis, Cyanea copelandii* ssp. *haleakalaensis, Cyanea horrida, Melicope ovalis, Phyllostegia bracteata, Phyllostegia haliakalae,* and *Plantago princeps.*

(D) NOTE: Map of Maui—Wet Cliff—Unit 2, Maui—Wet Cliff—Unit 3, and Maui—Wet Cliff—Unit 4 (Map 27) follows:

Map 27

Maui–Wet Cliff

Unit 2, Unit 3 and Unit 4



(xxviii) Maui—Wet Cliff—Unit 5 (2,048 aci 829 ha), Maui—Wet Cliff—Unit 6 (9,103 ac, 3,684 ha), Maui—Wet Cliff—Unit 7 (781 ac, 316 ha), and Maui—Wet Cliff—Unit 8 (337 ac, 137 ha)

(A) [Reserved for textual description of Unit 5.] This unit is critical habitat for *Alectryon macrococcus, Bidens campylotheca* ssp. *pentamera, Bidens conjuncta, Bonamia menziesii, Ctenitis squamigera, Cyanea glabra, Cyanea lobata, Cyanea magnicalyx, Cyrtandra filipes, Cyrtandra munroi, Dubautia plantaginea* ssp. *humilis, Gounaia vitifolia, Hesperomannia arborescens, Hesperomannia arbuscula, Isodendrion pyrifolium, Kadua laxiflora, Lysimachia lydgatei, Plantago princeps, Platanthera holochila, Pteris lidgatei, Remya mauiensis, Santalum haleakalae* var. *lanaiense,* and *Tetramolopium capillare.*

(B) [Reserved for textual description of Unit 6.] This unit is critical habitat for *Alectryon macrococcus, Bidens campylotheca* ssp. *pentamera, Bidens conjuncta, Bonamia menziesii, Ctenitis squamigera, Cyanea glabra, Cyanea lobata, Cyanea magnicalyx, Cyrtandra filipes, Cyrtandra munroi, Dubautia plantaginea* ssp. *humilis, Gounaia vitifolia, Hesperomannia arborescens, Hesperomannia arbuscula, Isodendrion pyrifolium, Kadua laxiflora, Lysimachia lydgatei, Plantago princeps, Platanthera holochila, Pteris lidgatei, Remya mauiensis, Santalum haleakalae* var. *lanaiense,* and *Tetramolopium capillare.*

(C) [Reserved for textual description of Unit 7.] This unit is critical habitat for *Alectryon macrococcus, Bidens campylotheca* ssp. *pentamera, Bidens conjuncta, Bonamia menziesii, Ctenitis squamigera, Cyanea glabra, Cyanea lobata, Cyanea magnicalyx, Cyrtandra filipes, Cyrtandra munroi, Dubautia plantaginea* ssp. *humilis, Gounaia vitifolia, Hesperomannia arborescens, Hesperomannia arbuscula, Isodendrion pyrifolium, Kadua laxiflora, Lysimachia lydgatei, Plantago princeps, Platanthera holochila, Pteris lidgatei, Remya mauiensis, Santalum haleakalae* var. *lanaiense,* and *Tetramolopium capillare.*

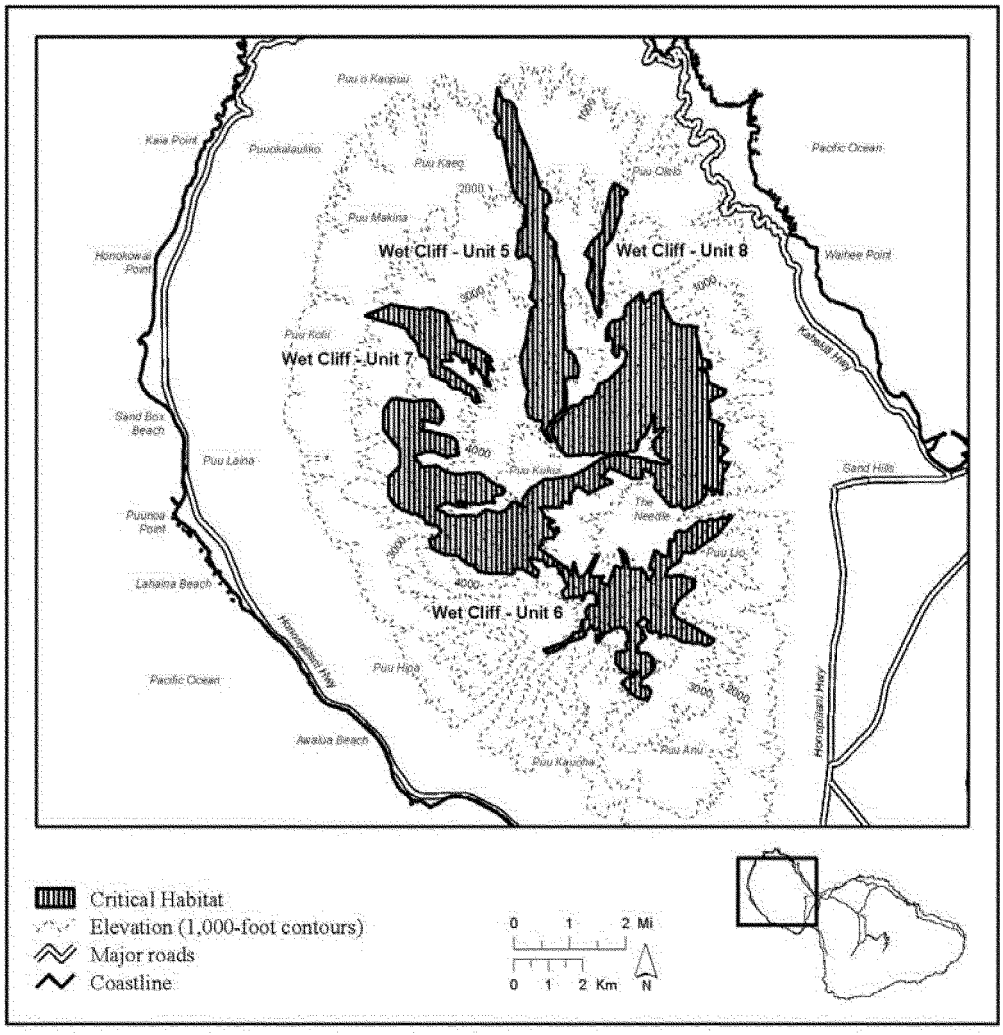
(D) [Reserved for textual description of Unit 8.] This unit is critical habitat for *Alectryon macrococcus, Bidens campylotheca* ssp. *pentamera, Bidens conjuncta, Bonamia menziesii, Ctenitis squamigera, Cyanea glabra, Cyanea lobata, Cyanea magnicalyx, Cyrtandra filipes, Cyrtandra munroi, Dubautia plantaginea* ssp. *humilis, Gounaia vitifolia, Hesperomannia arborescens, Hesperomannia arbuscula, Isodendrion pyrifolium, Kadua laxiflora, Lysimachia lydgatei, Plantago princeps, Platanthera holochila, Pteris lidgatei, Remya mauiensis, Santalum haleakalae* var. *lanaiense,* and *Tetramolopium capillare.*

(E) NOTE: Map of Maui—Wet Cliff—Unit 5, Maui—Wet Cliff—Unit 6, Maui—Wet Cliff—Unit 7, and Maui—Wet Cliff—Unit 8 (Map 28) follows:

Map 28

Maui–Wet Cliff

Unit 5, Unit 6, Unit 7 and Unit 8



(XXIX) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR MAUI

Unit name	Species occupied	Species unoccupied
Maui—Coastal—Unit 1		*Brighamii rockii.*
		Cyperus pennatiformis.
	Ischaemum byrone	*Ischaemum byrone.*
	Peucedanum sandwicense	*Peucedanum sandwicense.*
		Vigna o-wahuensis.
Maui—Coastal—Unit 2		*Brighamii rockii.*
		Cyperus pennatiformis.
		Ischaemum byrone.

(XXIX) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR MAUI—Continued

Unit name	Species occupied	Species unoccupied
		Peucedanum sandwicense.
		Vigna o-wahuensis.
Maui—Coastal—Unit 3		*Brighamii rockii*.
		Cyperus pennatiformis.
	Ischaemum byrone	*Ischaemum byrone*.
		Peucedanum sandwicense.
		Vigna o-wahuensis.
Maui—Coastal—Unit 4		*Brighamii rockii*.
		Cyperus pennatiformis.
	Ischaemum byrone	*Ischaemum byrone*.
	Peucedanum sandwicense	*Peucedanum sandwicense*.
		Vigna o-wahuensis.
Maui—Coastal—Unit 5		*Brighamii rockii*.
		Cyperus pennatiformis.
	Ischaemum byrone	*Ischaemum byrone*.
		Peucedanum sandwicense.
		Vigna o-wahuensis.
Maui—Coastal—Unit 6		*Brighamii rockii*.
		Cyperus pennatiformis.
		Ischaemum byrone.
		Peucedanum sandwicense.
		Vigna o-wahuensis.
Maui—Coastal—Unit 7		*Brighamii rockii*.
		Cyperus pennatiformis.
		Ischaemum byrone.
		Peucedanum sandwicense.
		Vigna o-wahuensis.
Maui—Coastal—Unit 8		*Brighamii rockii*.
		Cyperus pennatiformis.
		Ischaemum byrone.
		Peucedanum sandwicense.
		Vigna o-wahuensis.
Maui—Coastal—Unit 9		*Brighamii rockii*.
	Schenkia sebaeoides	*Schenkia sebaeoides*.
	Sesbania tementosa	*Sesbania tomentosa*.
Maui—Coastal—Unit 10		*Brighamii rockii*.
	Schenkia sebaeoides	*Schenkia sebaeoides*.
	Sesbania tomentosa	*Sesbania tomentosa*.
Maui—Coastal—Unit 11		*Brighamii rockii*.
	Schenkia sebaeoides	*Schenkia sebaeoides*.
		Sesbania tomentosa.
Maui—Lowland Dry—Unit 1	*Alectryon macrococcus*	*Alectryon macrococcus*.
		Bidens micrantha ssp. *kalealaha*.
	Bonamia menziesii	*Bonamia menziesii*.
		Canavalia pubescens.
	Cenchrus agrimonioides	*Cenchrus agrimonioides*.
		Colubrina oppositifolia.
		Ctenitis squamigera.
	Flueggea neowawraea	*Flueggea neowawraea*.
		Hibiscus brackenridgei.
	Melanthera kamolensis	*Melanthera kamolensis*.
	Melicope adscendens	*Melicope adscendens*.
		Melicope mucronulata.
		Neraudia sericea.
		Nototrichium humile.
	Santalum haleakalae var. *lanaiense*	*Santalum haleakalae* var. *lanaiense*.
	Sesbania tomentosa	*Sesbania tomentosa*.
		Solanum incompletum.
	Spermolepis hawaiiensis	*Spermolepis hawaiiensis*.
	Zanthoxylum hawaiiense	*Zanthoxylum hawaiiense*.
Maui—Lowland Dry—Unit 2		*Alectryon macrococcus*.
		Bidens micrantha ssp. *kalealaha*.
	Bonamia menziesii	*Bonamia menziesii*.
	Canavalia pubescens	*Canavalia pubescens*.
		Cenchrus agrimonioides.
		Colubrina oppositifolia.
		Ctenitis squamigera.
		Flueggea neowawraea.
	Hibiscus brackenridgei	*Hibiscus brackenridgei*.
		Melanthera kamolensis.
		Melicope adscendens.
		Melicope mucronulata.

(XXIX) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR MAUI—Continued

Unit name	Species occupied	Species unoccupied
		Neraudia sericea.
		Nototrichium humile.
		Santalum haleakalae var. *lanaiense*.
		Sesbania tomentosa.
		Solanum incompletum.
		Spermolepis hawaiiensis.
		Zanthoxylum hawaiiense.
Maui—Lowland Dry—Unit 3		*Alectryon macrococcus*.
		Bidens micrantha ssp. *kalealaha*.
		Bonamia menziesii.
	Canavalia pubescens	*Canavalia pubescens*.
		Cenchrus agrimonioides.
		Colubrina oppositifolia.
		Ctenitis squamigera.
		Flueggea neowawraea.
	Hibiscus brackenridgei	*Hibiscus brackenridgei*.
		Melanthera kamolensis.
		Melicope adscendens.
		Melicope mucronulata.
		Neraudia sericea.
		Nototrichium humile.
		Santalum haleakalae var. *lanaiense*.
		Sesbania tomentosa.
		Solanum incompletum.
		Spermolepis hawaiiensis.
		Zanthoxylum hawaiiense.
Maui—Lowland Dry—Unit 4		*Alectryon macrococcus*.
		Bidens micrantha ssp. *kalealaha*.
		Bonamia menziesii.
	Canavalia pubescens	*Canavalia pubescens*.
		Cenchrus agrimonioides.
		Colubrina oppositifolia.
		Ctenitis squamigera.
		Flueggea neowawraea.
		Hibiscus brackenridgei.
		Melanthera kamolensis.
		Melicope adscendens.
		Melicope mucronulata.
		Neraudia sericea.
		Nototrichium humile.
		Santalum haleakalae var. *lanaiense*.
		Sesbania tomentosa.
		Solanum incompletum.
		Spermolepis hawaiiensis.
		Zanthoxylum hawaiiense.
Maui—Lowland Dry—Unit 5	*Asplenium dielerectum*	*Asplenium dielerectum*.
	Bidens campylotheca ssp. *pentamera*	*Bidens campylotheca* ssp. *pentamera*.
	Cenchrus agrimonioides	*Cenchrus agrimonioides*.
	Ctenitis squamigera	*Ctenitis squamigera*.
		Cyanea obtusa.
	Gouania hillebrandii	*Gouania hillebrandii*.
		Hesperomannia arbuscula.
	Hibiscus brackenridgei	*Hibiscus brackenridgei*.
		Kadua coriacea.
		Lysimachia lydgatei.
		Neraudia sericea.
	Remya mauiensis	*Remya mauiensis*.
	Santalum haleakalae var. *lanaiense*	*Santalum haleakalae* var. *lanaiense*.
		Schiedea salicaria.
	Sesbania tomentosa	*Sesbania tomentosa*.
	Spermolepis hawaiiensis	*Spermolepis hawaiiensis*.
		Tetramolopium capillare.
		Tetramolopium remyi.
Maui—Lowland Dry—Unit 6		*Asplenium dielerectum*.
		Bidens campylotheca ssp. *pentamera*.
		Cenchrus agrimonioides.
		Ctenitis squamigera.
		Cyanea obtusa.
		Gouania hillebrandii.
		Hesperomannia arbuscula.
	Hibiscus brackenridgei	*Hibiscus brackenridgei*.
		Kadua coriacea.

(XXIX) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR MAUI—Continued

Unit name	Species occupied	Species unoccupied
		Lysimachia lydgatei.
		Neraudia sericea.
		Remya mauiensis.
		Santalum haleakalae var. *lanaiense*.
	Schiedea salicaria	*Schiedea salicaria*.
		Sesbania tomentosa.
		Spermolepis hawaiiensis.
		Tetramolopium capillare.
		Tetramolopium remyi.
Maui—Lowland Mesic—Unit 1		*Ctenitis squamigera*.
	Cyanea asplenifolia	*Cyanea asplenifolia*.
	Cyanea copelandii ssp. *haleakalaensis*	*Cyanea copelandii* ssp. *haleakalaensis*.
	Huperzia mannii	*Huperzia mannii*.
		Solanum incompletum.
Maui—Lowland Mesic—Unit 2		*Asplenium dielerectum*.
	Bidens campylotheca ssp. *pentamera*	*Bidens campylotheca* ssp. *pentamera*.
	Colubrina oppositifolia	*Colubrina oppositifolia*.
	Ctenitis squamigera	*Ctenitis squamigera*.
	Remya mauiensis	*Remya mauiensis*.
	Santalum haleakalae var. *lanaiense*	*Santalum haleakalae* var. *lanaiense*.
	Zanthoxylum hawaiiense	*Zanthoxylum hawaiiense*.
Maui—Lowland Mesic—Unit 3		*Asplenium dielerectum*.
		Bidens campylotheca ssp. *pentamera*.
		Colubrina oppositifolia.
		Ctenitis squamigera.
		Remya mauiensis.
		Santalum haleakalae var. *lanaiense*.
		Zanthoxylum hawaiiense.
Maui—Lowland Wet—Unit 1	*Bidens campylotheca* ssp. *waihoiensis*	*Bidens campylotheca* ssp. *waihoiensis*.
		Clermontia oblongifolia ssp. *mauiensis*.
		Clermontia peleana.
	Clermontia samuelii	*Clermontia samuelii*.
	Cyanea asplenifolia	*Cyanea asplenifolia*.
	Cyanea copelandii ssp. *haleakalaensis*	*Cyanea copelandii* ssp. *haleakalaensis*.
	Cyanea duvalliorum	*Cyanea duvalliorum*.
	Cyanea hamatiflora ssp. *hamatiflora*	*Cyanea hamatiflora* ssp. *hamatiflora*.
	Cyanea kunthiana	*Cyanea kunthiana*.
	Cyanea maritae	*Cyanea maritae*.
	Cyanea mceldowneyi	*Cyanea mceldowneyi*.
	Huperzia mannii	*Huperzia mannii*.
	Melicope balloui	*Melicope balloui*.
	Melicope ovalis	*Melicope ovalis*.
		Mucuna sloanei var. *persericea*.
		Wikstroemia villosa.
Maui—Lowland Wet—Unit 2		*Alectryon macrococcus*.
		Asplenium dielerectum.
		Bidens conjuncta.
		Bidens micrantha ssp. *kalealaha*.
		Clermontia oblongifolia ssp. *mauiensis*.
	Ctenitis squamigera	*Ctenitis squamigera*.
	Cyanea asplenifolia	*Cyanea asplenifolia*.
		Cyanea glabra.
		Cyanea kunthiana.
	Cyanea lobata	*Cyanea lobata*.
	Cyanea magnicalyx	*Cyanea magnicalyx*.
	Cyrtandra filipes	*Cyrtandra filipes*.
	Cyrtandra munroi	*Cyrtandra munroi*.
		Diplazium molokaiense.
		Hesperomannia arborescens.
		Hesperomannia arbuscula.
		Huperzia mannii.
		Isodendrion pyrifolium.
		Kadua laxiflora.
		Peucedanum sandwicense.
		Phyllostegia bracteata.
		Pteris lidgatei.
		Remya mauiensis.
	Santalum haleakalae var. *lanaiense*	*Santalum haleakalae* var. *lanaiense*.
		Wikstroemia villosa.
Maui—Lowland Wet—Unit 3		*Alectryon macrococcus*.
		Asplenium dielerectum.
	Bidens conjuncta	*Bidens conjuncta*.

(XXIX) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR MAUI—Continued

Unit name	Species occupied	Species unoccupied
		Bidens micrantha ssp. *kalealaha*.
		Clermontia oblongifolia ssp. *mauiensis*.
		Ctenitis squamigera.
	Cyanea asplenifolia	*Cyanea asplenifolia*.
		Cyanea glabra.
		Cyanea kunthiana.
		Cyanea lobata.
		Cyanea magnicalyx.
		Cyrtandra filipes.
		Cyrtandra munroi.
		Diplazium molokaiense.
		Hesperomannia arborescens.
		Hesperomannia arbuscula.
		Huperzia mannii.
		Isodendrion pyrifolium.
		Kadua laxiflora.
		Peucedanum sandwicense.
		Phyllostegia bracteata.
	Pteris lidgatei	*Pteris lidgatei*.
		Remya mauiensis.
		Santalum haleakalae var. *lanaiense*.
		Wikstroemia villosa.
Maui—Lowland Wet—Unit 4		*Alectryon macrococcus*.
		Asplenium dielerectum.
	Bidens conjuncta	*Bidens conjuncta*.
		Bidens micrantha ssp. *kalealaha*.
		Clermontia oblongifolia ssp. *mauiensis*.
		Ctenitis squamigera.
	Cyanea asplenifolia	*Cyanea asplenifolia*.
		Cyanea glabra.
		Cyanea kunthiana.
		Cyanea lobata.
		Cyanea magnicalyx.
		Cyrtandra filipes.
	Cyrtandra munroi	*Cyrtandra munroi*.
		Diplazium molokaiense.
	Hesperomannia arborescens	*Hesperomannia arborescens*.
		Hesperomannia arbuscula.
		Huperzia mannii.
		Isodendrion pyrifolium.
		Kadua laxiflora.
		Peucedanum sandwicense.
		Phyllostegia bracteata.
		Pteris lidgatei.
		Remya mauiensis.
		Santalum haleakalae var. *lanaiense*.
		Wikstroemia villosa.
Maui—Lowland Wet—Unit 5	*Alectryon macrococcus*	*Alectryon macrococcus*.
	Asplenium dielerectum	*Asplenium dielerectum*.
		Bidens conjuncta.
		Bidens micrantha ssp. *kalealaha*.
		Clermontia oblongifolia ssp. *mauiensis*.
		Ctenitis squamigera.
		Cyanea asplenifolia.
		Cyanea glabra.
		Cyanea kunthiana.
		Cyanea lobata.
		Cyanea magnicalyx.
		Cyrtandra filipes.
		Cyrtandra munroi.
		Diplazium molokaiense.
		Hesperomannia arborescens.
	Hesperomannia arbuscula	*Hesperomannia arbuscula*.
		Huperzia mannii.
		Isodendrion pyrifolium.
		Kadua laxiflora.
		Peucedanum sandwicense.
		Phyllostegia bracteata.
		Pteris lidgatei.
		Remya mauiensis.
		Santalum haleakalae var. lanaiense.
		Wikstroemia villosa.

(XXIX) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR MAUI—Continued

Unit name	Species occupied	Species unoccupied
Maui—Lowland Wet—Unit 6	*Alectryon macrococcus*	*Alectryon macrococcus*.
		Asplenium dielerectum.
		Bidens conjuncta.
	Bidens micrantha ssp. *kalealaha*	*Bidens micrantha* ssp. *kalealaha*.
		Clermontia oblongifolia ssp. *mauiensis*.
		Ctenitis squamigera.
	Cyanea asplenifolia	*Cyanea asplenifolia*.
		Cyanea glabra.
		Cyanea kunthiana.
	Cyanea lobata	*Cyanea lobata*.
		Cyanea magnicalyx.
		Cyrtandra filipes.
	Cyrtandra munroi	*Cyrtandra munroi*.
		Diplazium molokaiense.
		Hesperomannia arborescens.
		Hesperomannia arbuscula.
		Huperzia mannii.
		Isodendrion pyrifolium.
		Kadua laxiflora.
		Peucedanum sandwicense.
		Phyllostegia bracteata.
		Pteris lidgatei.
		Remya mauiensis.
	Santalum haleakalae var. *lanaiense*	*Santalum haleakalae* var. *lanaiense*.
		Wikstroemia villosa.
Maui—Lowland Wet—Unit 7		*Alectryon macrococcus*.
		Asplenium dielerectum.
		Bidens conjuncta.
		Bidens micrantha ssp. *kalealaha*.
		Clermontia oblongifolia ssp. *mauiensis*.
		Ctenitis squamigera.
		Cyanea asplenifolia.
		Cyanea glabra.
		Cyanea kunthiana.
		Cyanea lobata.
		Cyanea magnicalyx.
		Cyrtandra filipes.
		Cyrtandra munroi.
		Diplazium molokaiense.
		Hesperomannia arborescens.
		Hesperomannia arbuscula.
		Huperzia mannii.
		Isodendrion pyrifolium.
		Kadua laxiflora.
		Peucedanum sandwicense.
		Phyllostegia bracteata.
		Pteris lidgatei.
		Remya mauiensis.
		Santalum haleakalae var. *lanaiense*.
		Wikstroemia villosa.
Maui—Lowland Wet—Unit 8		*Alectryon macrococcus*.
		Asplenium dielerectum.
		Bidens conjuncta.
		Bidens micrantha ssp. *kalealaha*.
		Clermontia oblongifolia ssp. *mauiensis*.
		Ctenitis squamigera.
		Cyanea asplenifolia.
		Cyanea glabra.
		Cyanea kunthiana.
		Cyanea lobata.
		Cyanea magnicalyx.
		Cyrtandra filipes.
		Cyrtandra munroi.
		Diplazium molokaiense.
		Hesperomannia arborescens.
		Hesperomannia arbuscula.
		Huperzia mannii.
		Isodendrion pyrifolium.
		Kadua laxiflora.
		Peucedanum sandwicense.
		Phyllostegia bracteata.
		Pteris lidgatei.

(XXIX) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR MAUI—Continued

Unit name	Species occupied	Species unoccupied
		Remya mauiensis.
		Santalum haleakalae var. *lanaiense*.
		Wikstroemia villosa.
Maui—Montane Wet—Unit 1	.....	*Adenophorus periens*.
	Asplenium peruvianum var. *insulare*	*Asplenium peruvianum* var. *insulare*.
		Bidens campylotheca ssp. *pentamera*.
		Bidens campylotheca ssp. *waihoiensis*.
	Clermontia oblongifolia ssp. *mauiensis*	*Clermontia oblongifolia* ssp. *mauiensis*.
		Clermontia samuelii.
	Cyanea copelandii ssp. *haleakalaensis*	*Cyanea copelandii* ssp. *haleakalaensis*.
	Cyanea duvalliorum	*Cyanea duvalliorum*.
		Cyanea glabra.
		Cyanea hamatiflora ssp. *hamatiflora*.
	Cyanea horrida	*Cyanea horrida*.
	Cyanea kunthiana	*Cyanea kunthiana*.
	Cyanea maritae	*Cyanea maritae*.
	Cyanea mceldowneyi	*Cyanea mceldowneyi*.
		Cyrtandra ferripilosa.
	Diplazium molokaiense	*Diplazium molokaiense*.
		Geranium hanaense.
		Geranium multiflorum.
	Huperzia mannii	*Huperzia mannii*.
	Melicope balloui	*Melicope balloui*.
		Melicope ovalis.
		Peperomia subpetiolata.
		Phyllostegia bracteata.
		Phyllostegia mannii.
	Phyllostegia pilosa	*Phyllostegia pilosa*.
		Platanthera holochila.
		Schiedea jacobii.
		Wikstroemia villosa.
Maui—Montane Wet—Unit 2	.....	*Adenophorus periens*.
	Asplenium peruvianum var. *insulare*	*Asplenium peruvianum* var. *insulare*.
	Bidens campylotheca ssp. *pentamera*	*Bidens campylotheca* ssp. *pentamera*.
	Bidens campylotheca ssp. *waihoiensis*	*Bidens campylotheca* ssp. *waihoiensis*.
		Clermontia oblongifolia ssp. *mauiensis*.
	Clermontia samuelii	*Clermontia samuelii*.
	Cyanea copelandii ssp. *haleakalaensis*	*Cyanea copelandii* ssp. *haleakalaensis*.
	Cyanea duvalliorum	*Cyanea duvalliorum*.
		Cyanea glabra.
	Cyanea hamatiflora ssp. *hamatiflora*	*Cyanea hamatiflora* ssp. *hamatiflora*.
	Cyanea horrida	*Cyanea horrida*.
	Cyanea kunthiana	*Cyanea kunthiana*.
		Cyanea maritae.
	Cyanea mceldowneyi	*Cyanea mceldowneyi*.
		Cyrtandra ferripilosa.
		Diplazium molokaiense.
	Geranium hanaense	*Geranium hanaense*.
	Geranium multiflorum	*Geranium multiflorum*.
		Huperzia mannii.
		Melicope balloui.
		Melicope ovalis.
		Peperomia subpetiolata.
		Phyllostegia bracteata.
		Phyllostegia mannii.
		Phyllostegia pilosa.
		Platanthera holochila.
		Schiedea jacobii.
	Wikstroemia villosa	*Wikstroemia villosa*.
Maui—Montane Wet—Unit 3	.....	*Adenophorus periens*.
		Asplenium peruvianum var. *insulare*.
	Bidens campylotheca ssp. *pentamera*	*Bidens campylotheca* ssp. *pentamera*.
	Bidens campylotheca ssp. *waihoiensis*	*Bidens campylotheca* ssp. *waihoiensis*.
		Clermontia oblongifolia ssp. *mauiensis*.
		Clermontia samuelii.
	Cyanea copelandii ssp. *haleakalaensis*	*Cyanea copelandii* ssp. *haleakalaensis*.
		Cyanea duvalliorum.
		Cyanea glabra.
	Cyanea hamatiflora ssp. *hamatiflora*	*Cyanea hamatiflora* ssp. *hamatiflora*.
		Cyanea horrida.
		Cyanea kunthiana.
	Cyanea maritae	*Cyanea maritae*.

(XXIX) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR MAUI—Continued

Unit name	Species occupied	Species unoccupied
		Cyanea mceldowneyi.
		Cyrtandra ferripilosa.
		Diplazium molokaiense.
		Geranium hanaense.
		Geranium multiflorum.
		Huperzia mannii.
		Melicope balloui.
	Melicope ovalis	*Melicope ovalis*.
		Peperomia subpetiolata.
		Phyllostegia bracteata.
		Phyllostegia mannii.
		Phyllostegia pilosa.
		Platanthera holochila.
		Schiedea jacobii.
		Wikstroemia villosa.
Maui—Montane Wet—Unit 4		*Adenophorus periens*.
		Asplenium peruvianum var. *insulare*.
		Bidens campylotheca ssp. *pentamera*.
		Bidens campylotheca ssp. *waihoiensis*.
		Clermontia oblongifolia ssp. *mauiensis*.
	Clermontia samuelii	*Clermontia samuelii*.
	Cyanea copelandii ssp. *haleakalaensis*	*Cyanea copelandii* ssp. *haleakalaensis*.
		Cyanea duvalliorum.
		Cyanea glabra.
	Cyanea hamatiflora ssp. *hamatiflora*	*Cyanea hamatiflora* ssp. *hamatiflora*.
	Cyanea horrida	*Cyanea horrida*.
	Cyanea kunthiana	*Cyanea kunthiana*.
	Cyanea maritae	*Cyanea maritae*.
		Cyanea mceldowneyi.
	Cyrtandra ferripilosa	*Cyrtandra ferripilosa*.
		Diplazium molokaiense.
		Geranium hanaense.
		Geranium multiflorum.
	Huperzia mannii	*Huperzia mannii*.
		Melicope balloui.
		Melicope ovalis.
		Peperomia subpetiolata.
		Phyllostegia bracteata.
		Phyllostegia mannii.
		Phyllostegia pilosa.
		Platanthera holochila.
		Schiedea jacobii.
		Wikstroemia villosa.
Maui—Montane Wet—Unit 5		*Adenophorus periens*.
		Asplenium peruvianum var. *insulare*.
		Bidens campylotheca ssp. *pentamera*.
		Bidens campylotheca ssp. *waihoiensis*.
		Clermontia oblongifolia ssp. *mauiensis*.
		Clermontia samuelii.
		Cyanea copelandii ssp. *haleakalaensis*.
		Cyanea duvalliorum.
		Cyanea glabra.
		Cyanea hamatiflora ssp. *hamatiflora*.
		Cyanea horrida.
		Cyanea kunthiana.
		Cyanea maritae.
		Cyanea mceldowneyi.
		Cyrtandra ferripilosa.
		Diplazium molokaiense.
		Geranium hanaense.
		Geranium multiflorum.
		Huperzia mannii.
		Melicope balloui.
		Melicope ovalis.
		Peperomia subpetiolata.
		Phyllostegia bracteata.
		Phyllostegia mannii.
		Phyllostegia pilosa.
		Platanthera holochila.
		Schiedea jacobii.
		Wikstroemia villosa.
Maui—Montane Wet—Unit 6		*Acaena exigua*.

(XXIX) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR MAUI—Continued

Unit name	Species occupied	Species unoccupied
	Bidens conjuncta	*Bidens conjuncta.*
	Calamagrostis hillebrandii	*Calamagrostis hillebrandii.*
	Cyanea kunthiana	*Cyanea kunthiana.*
		Cyrtandra oxybapha.
	Geranium hillebrandii	*Geranium hillebrandii.*
		Huperzia mannii.
	Myrsine vaccinioides	*Myrsine vaccinioides.*
		Phyllostegia bracteata.
		Platanthera holochila.
	Sanicula purpurea	*Sanicula purpurea.*
Maui—Montane Wet—Unit 7		*Acaena exigua.*
		Bidens conjuncta.
		Calamagrostis hillebrandii.
		Cyanea kunthiana.
	Cyrtandra oxybapha	*Cyrtandra oxybapha.*
		Geranium hillebrandii.
		Huperzia mannii.
		Myrsine vaccinioides.
		Phyllostegia bracteata.
	Platanthera holochila	*Platanthera holochila.*
		Sanicula purpurea.
Maui—Montane Wet—Unit 8		*Acaena exigua.*
		Bidens conjuncta.
		Calamagrostis hillebrandii.
		Cyanea kunthiana.
		Cyrtandra oxybapha.
		Geranium hillebrandii.
		Huperzia mannii.
		Myrsine vaccinioides.
		Phyllostegia bracteata.
		Platanthera holochila.
		Sanicula purpurea.
Maui—Montane Mesic—Unit 1		*Alectryon macrococcus.*
	Argyroxiphium sandwicense ssp. *macrocephalum.*	*Argyroxiphium sandwicense* ssp. *macrocephalum.*
	Asplenium dielerectum	*Asplenium dielerectum.*
	Asplenium peruvianum var. *insulare*	*Asplenium peruvianum* var. *insulare.*
	Bidens campylotheca ssp. *pentamera*	*Bidens campylotheca* ssp. *pentamera.*
		Bidens micrantha ssp. *kalealaha.*
	Clermontia lindseyana	*Clermontia lindseyana.*
		Cyanea glabra.
		Cyanea hamatiflora ssp. *hamatiflora.*
	Cyanea horrida	*Cyanea horrida.*
		Cyanea kunthiana.
	Cyanea mceldowneyi	*Cyanea mceldowneyi.*
	Cyanea obtusa	*Cyanea obtusa.*
	Cyrtandra ferripilosa	*Cyrtandra ferripilosa.*
	Cyrtandra oxybapha	*Cyrtandra oxybapha.*
	Diplazium molokaiense	*Diplazium molokaiense.*
	Geranium arboreum	*Geranium arboreum.*
	Geranium multiflorum	*Geranium multiflorum.*
	Huperzia mannii	*Huperzia mannii.*
	Melicope adscendens	*Melicope adscendens.*
	Neraudia sericea	*Neraudia sericea.*
		Phyllostegia bracteata.
		Phyllostegia mannii.
	Santalum haleakalae var. *lanaiense*	*Santalum haleakalae* var. *lanaiense.*
		Wikstroemia villosa.
		Zanthoxylum hawaiiense.
Maui—Montane Mesic—Unit 2	*Ctenitis squamigera*	*Ctenitis squamigera.*
	Cyanea magnicalyx	*Cyanea magnicalyx.*
	Diplazium molokaiense	*Diplazium molokaiense.*
		Geranium hillebrandii.
		Huperzia mannii.
	Lysimachia lydgatei	*Lysimachia lydgatei.*
		Remya mauiensis.
	Santalum haleakalae var. *lanaiense*	*Santalum haleakalae* var. *lanaiense.*
	Stenogyne kauaulaensis	*Stenogyne kauaulaensis.*
	Zanthoxylum hawaiiense	*Zanthoxylum hawaiiense.*
Maui—Montane Mesic—Unit 3		*Ctenitis squamigera.*
		Cyanea magnicalyx.
		Diplazium molokaiense.

(XXIX) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR MAUI—Continued

Unit name	Species occupied	Species unoccupied
	Geranium hillebrandii	*Geranium hillebrandii*.
	Huperzia mannii	*Huperzia mannii*.
	Lysimachia lydgatei	*Lysimachia lydgatei*.
		Remya mauiensis.
		Santalum haleakalae var. *lanaiense*.
		Stenogyne kauaulaensis.
		Zanthoxylum hawaiiense.
Maui—Montane Mesic—Unit 4		*Ctenitis squamigera*.
		Cyanea magnicalyx.
		Diplazium molokaiense.
		Geranium hillebrandii.
		Huperzia mannii.
	Lysimachia lydgatei	*Lysimachia lydgatei*.
		Remya mauiensis.
		Santalum haleakalae var. *lanaiense*.
		Stenogyne kauaulaensis.
		Zanthoxylum hawaiiense.
Maui—Montane Mesic—Unit 5		*Ctenitis squamigera*.
		Cyanea magnicalyx.
		Diplazium molokaiense.
		Geranium hillebrandii.
		Huperzia mannii.
		Lysimachia lydgatei.
	Remya mauiensis	*Remya mauiensis*.
	Santalum haleakalae var. *lanaiense*	*Santalum haleakalae* var. *lanaiense*.
		Stenogyne kauaulaensis.
		Zanthoxylum hawaiiense.
Maui—Montane Mesic—Unit 6		*Ctenitis squamigera*.
		Cyanea magnicalyx.
		Diplazium molokaiense.
		Geranium hillebrandii.
		Huperzia mannii.
		Lysimachia lydgatei.
		Remya mauiensis.
		Santalum haleakalae var. *lanaiense*.
		Stenogyne kauaulaensis.
		Zanthoxylum hawaiiense.
Maui—Montane Dry—Unit 1		*Alectryon macrococcus*.
		Geranium arboreum.
	Melicope knudsenii	*Melicope knudsenii*.
		Melicope mucronulata.
	Santalum haleakalae var. *lanaiense*	*Santalum haleakalae* var. *lanaiense*.
	Zanthoxylum hawaiiense	*Zanthoxylum hawaiiense*.
Maui—Subalpine—Unit 1		*Argyroxiphium sandwicense* ssp. *macrocephalum*.
	Asplenium peruvianum var. *insulare*	*Asplenium peruvianum* var. *insulare*.
	Bidens micrantha ssp. *kalealaha*	*Bidens micrantha* ssp. *kalealaha*.
	Geranium arboreum	*Geranium arboreum*.
		Geranium multiflorum.
		Phyllostegia bracteata.
		Schiedea haleakalensis.
		Solanum incompletum.
		Zanthoxylum hawaiiense.
Maui—Subalpine—Unit 2	*Argyroxiphium sandwicense* ssp. *macrocephalum*.	*Argyroxiphium sandwicense* ssp. *macrocephalum*.
		Asplenium peruvianum var. *insulare*.
		Bidens micrantha ssp. *kalealaha*.
		Geranium arboreum.
	Geranium multiflorum	*Geranium multiflorum*.
		Phyllostegia bracteata.
	Schiedea haleakalensis	*Schiedea haleakalensis*.
		Solanum incompletum.
		Zanthoxylum hawaiiense.
Maui—Alpine—Unit 1	*Argyroxiphium sandwicense* ssp. *macrocephalum*.	*Argyroxiphium sandwicense* ssp. *macrocephalum*.
Maui—Dry Cliff—Unit 1	*Bidens campylotheca* ssp. *pentamera*	*Bidens campylotheca* ssp. *pentamera*.
		Diplazium molokaiense.
		Plantago princeps.
		Schiedea haleakalensis.
Maui—Dry Cliff—Unit 2		*Bidens campylotheca* ssp. *pentamera*.
		Diplazium molokaiense.
	Plantago princeps	*Plantago princeps*.

(XXIX) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR MAUI—Continued

Unit name	Species occupied	Species unoccupied
	Schiedea haleakalensis	*Schiedea haleakalensis.*
Maui—Dry Cliff—Unit 3		*Bidens campylotheca* ssp. *pentamera.*
		Diplazium molokaiense.
		Plantago princeps.
		Schiedea haleakalensis.
Maui—Dry Cliff—Unit 4		*Bidens campylotheca* ssp. *pentamera.*
		Diplazium molokaiense.
		Plantago princeps.
		Schiedea haleakalensis.
Maui—Dry Cliff—Unit 5		*Bonamia menziesii.*
		Diplazium molokaiense.
		Hesperomannia arbuscula.
		Isodendrion pyrifolium.
		Kadua laxiflora.
		Neraudia sericea.
		Tetramolopium capillare.
Maui—Dry Cliff—Unit 6		*Bonamia menziesii.*
		Diplazium molokaiense.
		Hesperomannia arbuscula.
		Isodendrion pyrifolium.
		Kadua laxiflora.
		Neraudia sericea.
		Tetramolopium capillare.
Maui—Dry Cliff—Unit 7		*Bonamia menziesii.*
		Diplazium molokaiense.
		Hesperomannia arbuscula.
		Isodendrion pyrifolium.
		Kadua laxiflora.
		Neraudia sericea.
		Tetramolopium capillare.
Maui—Wet Cliff—Unit 1	*Bidens campylotheca* ssp. *pentamera*	*Bidens campylotheca* ssp. *pentamera.*
		Bidens campylotheca ssp. *waihoiensis.*
		Cyanea copelandii ssp. *haleakalaensis.*
	Cyanea horrida	*Cyanea horrida.*
		Melicope ovalis.
		Phyllostegia bracteata.
		Phyllostegia haliakalae.
		Plantago princeps.
Maui—Wet Cliff—Unit 2	*Bidens campylotheca* ssp. *pentamera*	*Bidens campylotheca* ssp. *pentamera.*
	Bidens campylotheca ssp. *waihoiensis*	*Bidens campylotheca* ssp. *waihoiensis.*
	Cyanea copelandii ssp. *haleakalaensis*	*Cyanea copelandii* ssp. *haleakalaensis.*
		Cyanea horrida.
	Melicope ovalis	*Melicope ovalis.*
		Phyllostegia bracteata.
		Phyllostegia haliakalae.
	Plantago princeps	*Plantago princeps.*
Maui—Wet Cliff—Unit 3		*Bidens campylotheca* ssp. *pentamera.*
		Bidens campylotheca ssp. *waihoiensis.*
		Cyanea copelandii ssp. *haleakalaensis.*
		Cyanea horrida.
		Melicope ovalis.
		Phyllostegia bracteata.
		Phyllostegia haliakalae.
		Plantago princeps.
Maui—Wet Cliff—Unit 4		*Bidens campylotheca* ssp. *pentamera.*
	Bidens campylotheca ssp. *waihoiensis*	*Bidens campylotheca* ssp. *waihoiensis.*
		Cyanea copelandii ssp. *haleakalaensis.*
		Cyanea horrida.
		Melicope ovalis.
		Phyllostegia bracteata.
		Phyllostegia haliakalae.
		Plantago princeps.
Maui—Wet Cliff—Unit 5		*Alectryon macrococcus.*
		Bidens campylotheca ssp. *pentamera.*
	Bidens conjuncta	*Bidens conjuncta.*
		Bonamia menziesii.
		Ctenitis squamigera.
		Cyanea glabra.
	Cyanea lobata	*Cyanea lobata.*
		Cyanea magnicalyx.
		Cyrtandra filipes.
	Cyrtandra munroi	*Cyrtandra munroi.*

(XXIX) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR MAUI—Continued

Unit name	Species occupied	Species unoccupied
		Dubautia plantaginea ssp. *humilis*.
		Gouania vitifolia.
	Hesperomannia arborescens	*Hesperomannia arborescens*.
		Hesperomannia arbuscula.
		Isodendrion pyrifolium.
		Kadua laxiflora.
		Lysimachia lydgatei.
		Plantago princeps.
		Platanthera holochila.
		Pteris lidgatei.
		Remya mauiensis.
		Santalum haleakalae var. *lanaiense*.
		Tetramolopium capillare.
Maui—Wet Cliff—Unit 6	*Alectryon macrococcus*	*Alectryon macrococcus*.
		Bidens campylotheca ssp. *pentamera*.
	Bidens conjuncta	*Bidens conjuncta*.
		Bonamia menziesii.
	Ctenitis squamigera	*Ctenitis squamigera*.
		Cyanea glabra.
		Cyanea lobata.
	Cyanea magnicalyx	*Cyanea magnicalyx*.
	Cyrtandra filipes	*Cyrtandra filipes*.
	Cyrtandra munroi	*Cyrtandra munroi*.
	Dubautia plantaginea ssp. *humilis*	*Dubautia plantaginea* ssp. *humilis*.
		Gouania vitifolia.
	Hesperomannia arborescens	*Hesperomannia arborescens*.
		Hesperomannia arbuscula.
		Isodendrion pyrifolium.
	Kadua laxiflora	*Kadua laxiflora*.
	Lysimachia lydgatei	*Lysimachia lydgatei*.
	Plantago princeps	*Plantago princeps*.
	Platanthera holochila	*Platanthera holochila*.
	Pteris lidgatei	*Pteris lidgatei*.
	Remya mauiensis	*Remya mauiensis*.
	Santalum haleakalae var. *lanaiense*	*Santalum haleakalae* var. *lanaiense*.
		Tetramolopium capillare.
Maui—Wet Cliff—Unit 7	*Alectryon macrococcus*	*Alectryon macrococcus*.
		Bidens campylotheca ssp. *pentamera*.
		Bidens conjuncta.
	Bonamia menziesii	*Bonamia menziesii*.
	Ctenitis squamigera	*Ctenitis squamigera*.
		Cyanea glabra.
		Cyanea lobata.
		Cyanea magnicalyx.
	Cyrtandra filipes	*Cyrtandra filipes*.
	Cyrtandra munroi	*Cyrtandra munroi*.
		Dubautia plantaginea ssp. *humilis*.
		Gouania vitifolia.
		Hesperomannia arborescens.
		Hesperomannia arbuscula.
		Isodendrion pyrifolium.
		Kadua laxiflora.
		Lysimachia lydgatei.
		Plantago princeps.
	Platanthera holochila	*Platanthera holochila*.
		Pteris lidgatei.
		Remya mauiensis.
		Santalum haleakalae var. *lanaiense*.
		Tetramolopium capillare.
Maui—Wet Cliff—Unit 8		*Alectryon macrococcus*.
		Bidens campylotheca ssp. *pentamera*.
		Bidens conjuncta.
		Bonamia menziesii.
		Ctenitis squamigera.
		Cyanea glabra.
		Cyanea lobata.
		Cyanea magnicalyx.
	Cyrtandra filipes	*Cyrtandra filipes*.
		Cyrtandra munroi.
		Dubautia plantaginea ssp. *humilis*.
		Gouania vitifolia.
		Hesperomannia arborescens.

(XXIX) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR MAUI—Continued

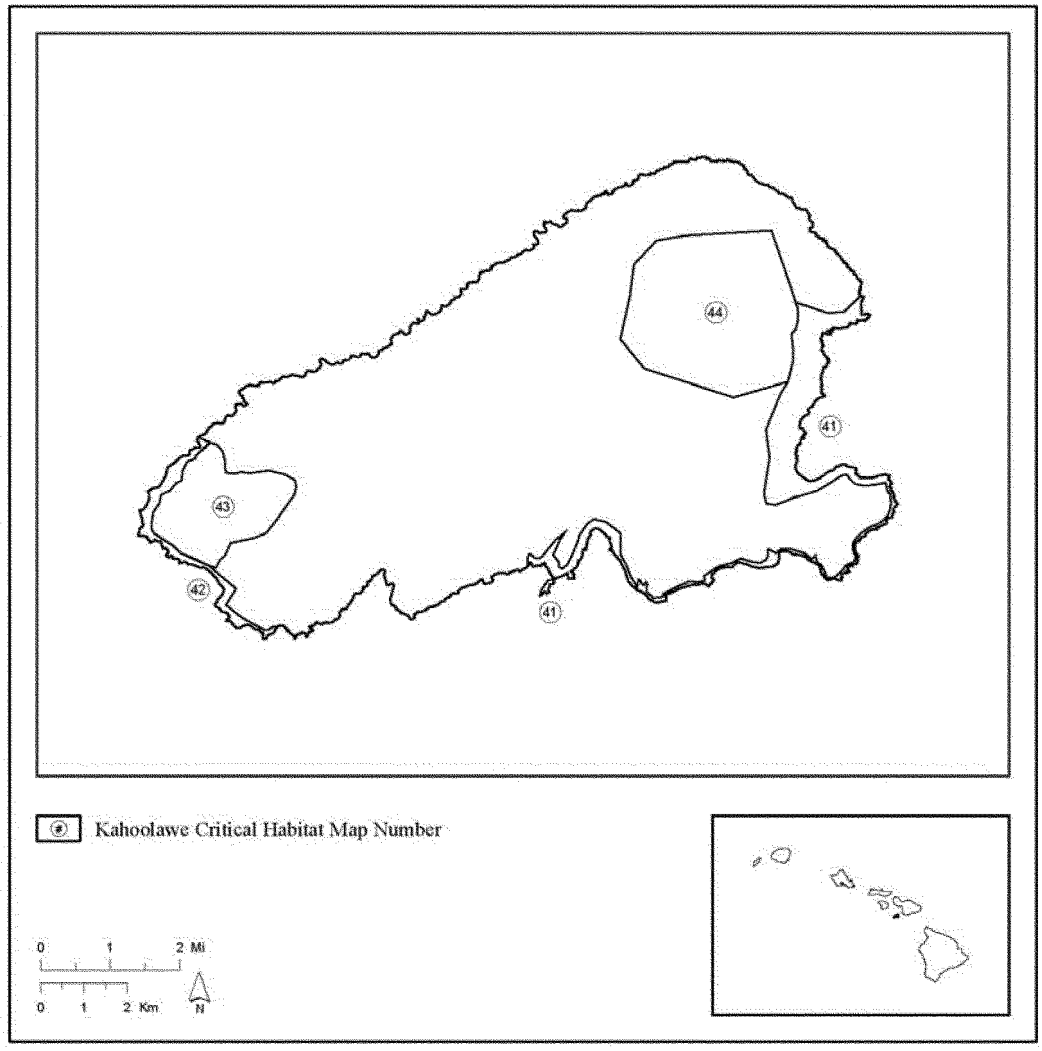
Unit name	Species occupied	Species unoccupied
		Hesperomannia arbuscula. *Isodendrion pyrifolium*. *Kadua laxiflora*. *Lysimachia lydgatei*. *Plantago princeps*. *Platanthera holochila*. *Pteris lidgatei*. *Remya mauiensis*. *Santalum haleakalae* var. *lanaiense*. *Tetramolopium capillare*.

(2) *Kahoolawe.* Critical habitat units are described below. Coordinates are in UTM Zone 4 with units in meters using North American Datum of 1983 (NAD83). The following map shows the general locations of the critical habitat units designated on the island of Kahoolawe. Existing manmade features and structures, such as buildings, roads, railroads, airports, runways, other paved areas, lawns, and other urban landscaped areas, do not contain one or more of the physical and biological features. Federal actions limited to those areas, therefore, would not trigger a consultation under section 7 of the Act unless they may affect the species or physical or biological features in adjacent critical habitat.

(i) NOTE: Map 29, Kahoolawe Index Map, follows:

Map 29

Kahoolawe Critical Habitat–Island Index Map



(ii) Kahoolawe—Coastal—Unit 1 (1,515 ac, 613 ha) and Kahoolawe—Coastal—Unit 2 (12 ac, 5 ha)

(A) [Reserved for textual description of Unit 1.] This unit is critical habitat for *Kanaloa kahoolawensis, Sesbania tomentosa,* and *Vigna o-wahuensis.*

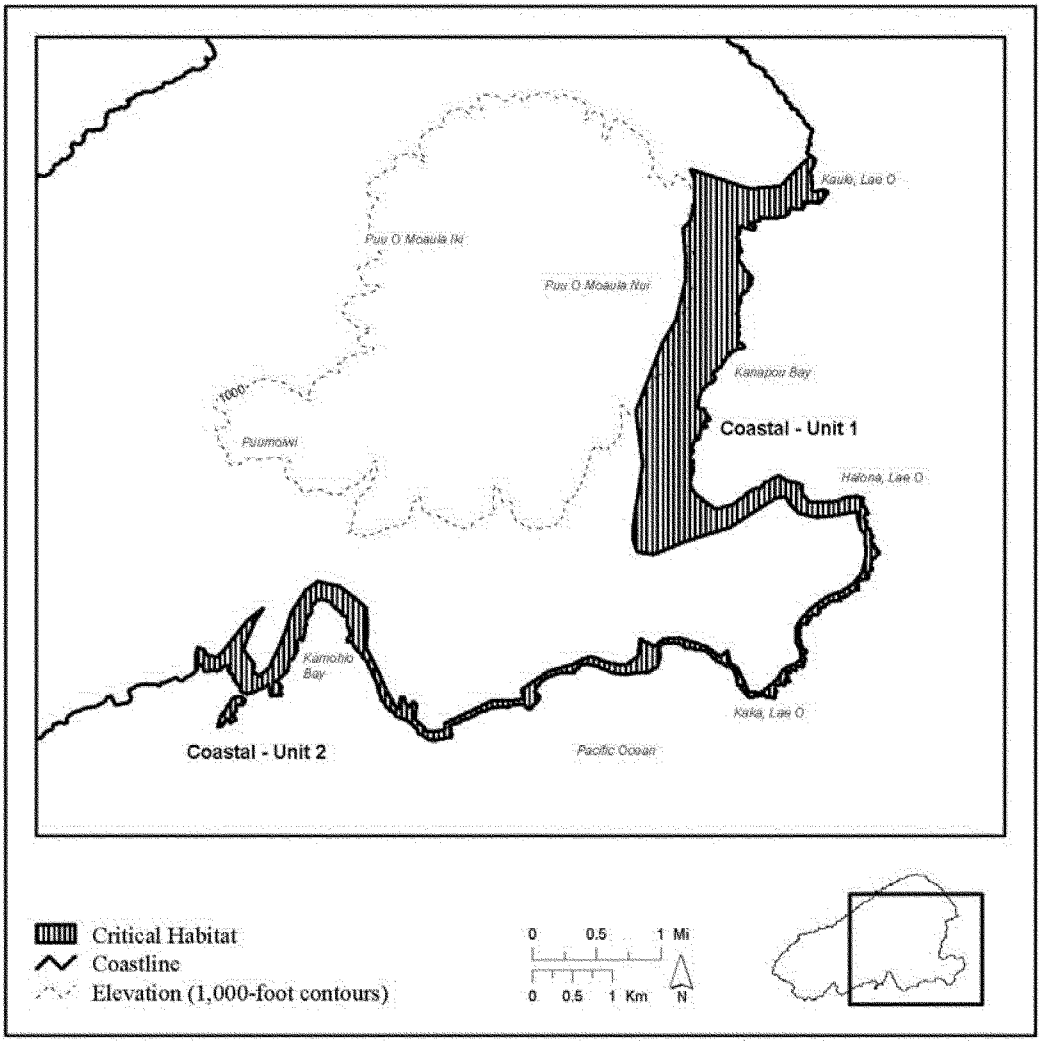
(B) [Reserved for textual description of Unit 2.] This unit is critical habitat for *Kanaloa kahoolawensis, Sesbania tomentosa,* and *Vigna o-wahuensis.*

(C) NOTE: Map of Kahoolawe—Coastal—Unit 1 and Kahoolawe—Coastal—Unit 2 (Map 30) follows:

Map 30

Kahoolawe–Coastal

Unit 1 and Unit 2



(iii) Kahoolawe—Coastal—Unit 3 (339 ac, 137 ha)

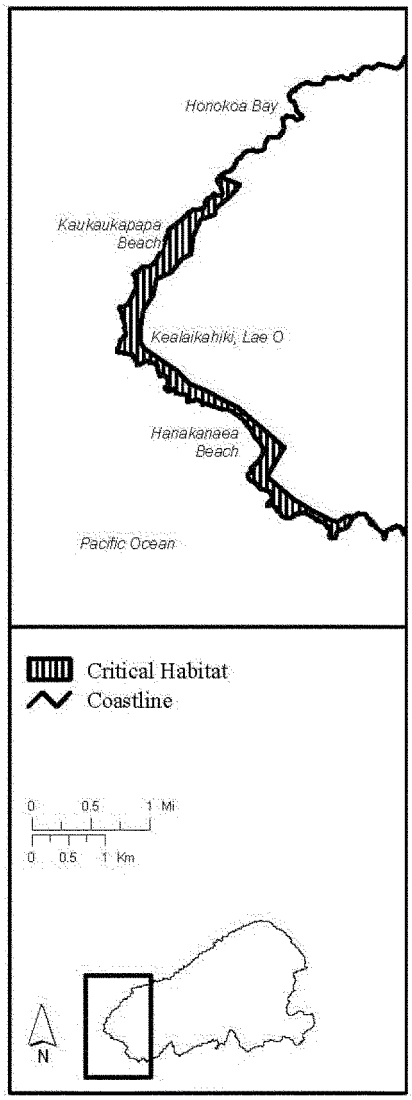
(A) [Reserved for textual description of Unit 3.] This unit is critical habitat for *Kanaloa kahoolawensis, Sesbania tomentosa,* and *Vigna o-wahuensis.*

(B) NOTE: Map of Kahoolawe—Coastal—Unit 3 (Map 31) follows:

Map 31

Kahoolawe–Coastal

Unit 3



(iv) Kahoolawe—Lowland Dry—Unit 1 (1,380 ac, 559 ha)

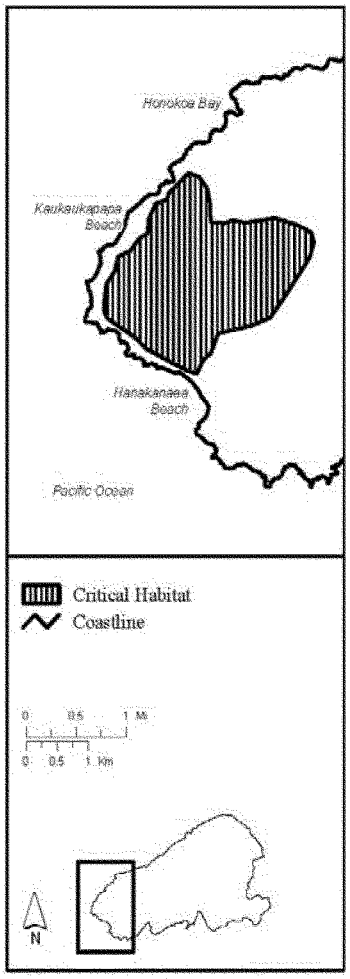
(A) [Reserved for textual description of Unit 1.] This unit is critical habitat for *Gouania hillebrandii, Hibiscus brackenridgei, Kanaloa kahoolawensis, Neraudia sericea, Sesbania tomentosa,* and *Vigna o-wahuensis.*

(B) NOTE: Map of Kahoolawe—Lowland Dry—Unit 1 (Map 32) follows:

Map 32

Kahoolawe–Lowland Dry

Unit 1



(v) Kahoolawe—Lowland Dry—Unit 2 (3,205 ac, 1,297 ha)

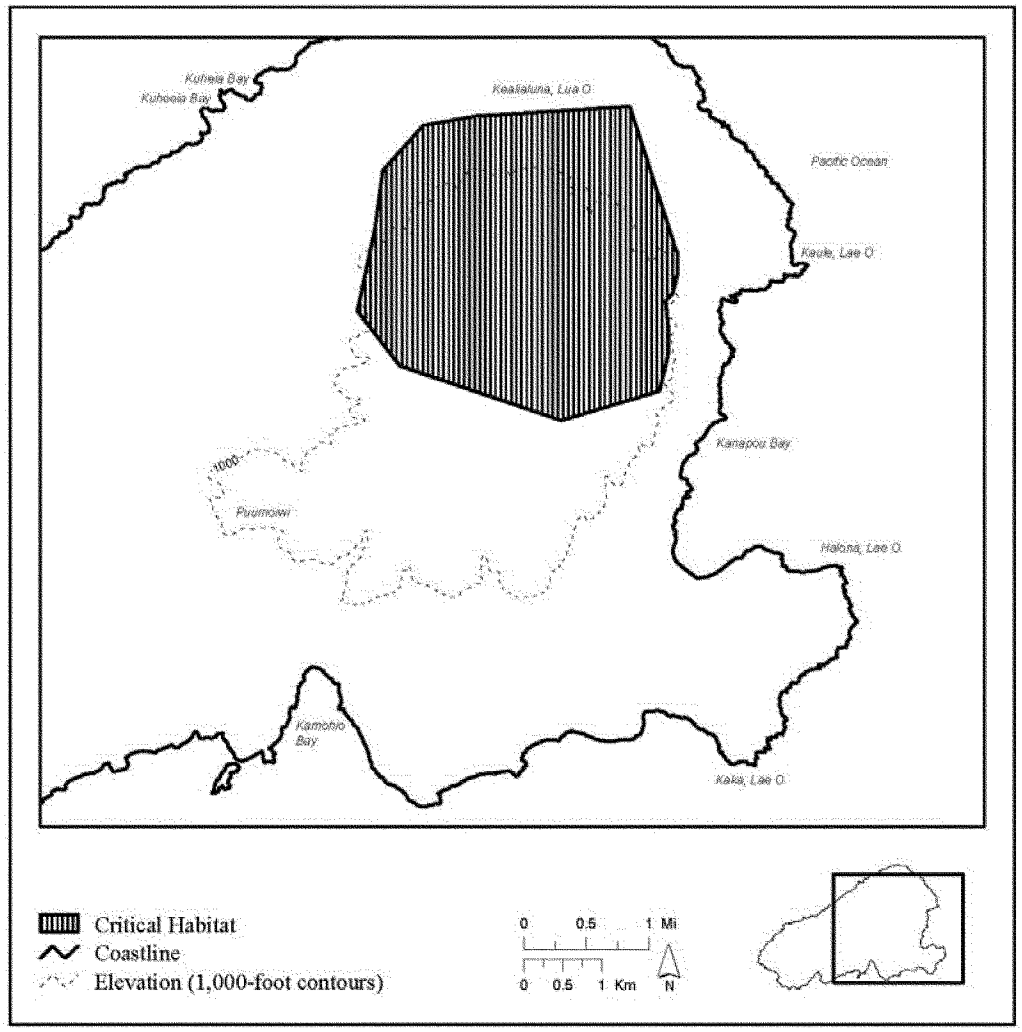
(A) [Reserved for textual description of Unit 2.] This unit is critical habitat for *Gouania hillebrandii, Hibiscus brackenridgei, Kanaloa kahoolawensis, Neraudia sericea, Sesbania tomentosa,* and *Vigna o-wahuensis.*

(B) NOTE: Map of Kahoolawe—Lowland Dry—Unit 2 (Map 33) follows:

Map 33

Kahoolawe–Lowland Dry

Unit 2



(VI) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR KAHOOLAWE

Unit name	Species occupied	Species unoccupied
Kahoolawe—Coastal—Unit 1	*Kanaloa kahoolawensis*	*Kanaloa kahoolawensis.* *Sesbania tomentosa.* *Vigna o-wahuensis.*
Kahoolawe—Coastal—Unit 2	*Sesbania tomentosa*	*Kanaloa kahoolawensis.* *Sesbania tomentosa.* *Vigna o-wahuensis.*
Kahoolawe—Coastal—Unit 3		*Kanaloa kahoolawensis.* *Sesbania tomentosa.* *Vigna o-wahuensis.*
Kahoolawe—Lowland Dry—Unit 1		*Gouania hillebrandii.* *Hibiscus brackenridgei.* *Kanaloa kahoolawensis.* *Neraudia sericea.* *Sesbania tomentosa.* *Vigna o-wahuensis.*
Kahoolawe—Lowland Dry—Unit 2		*Gouania hillebrandii.* *Hibiscus brackenridgei.* *Kanaloa kahoolawensis.*

(VI) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR KAHOOLAWE—Continued

Unit name	Species occupied	Species unoccupied
		Neraudia sericea. *Sesbania tomentosa.* *Vigna o-wahuensis.*

(f) *Plants on Maui and Kahoolawe; Constituent elements.*

(1) *Flowering plants.*

Family Amaranthaceae

Nototrichium humile (KULUI)

Maui—Lowland Dry—Unit 1, Maui—Lowland Dry—Unit 2, Maui—Lowland Dry—Unit 3, and Maui—Lowland Dry—Unit 4, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Nototrichium humile* on Maui. In units Maui—Lowland Dry—Unit 1, Maui—Lowland Dry—Unit 2, Maui—Lowland Dry—Unit 3, and Maui—Lowland Dry—Unit 4, the physical and biological features of critical habitat are:

(i) Elevation: Less than 3,300 ft (1,000 m).

(ii) Annual precipitation: Less than 50 in (130 cm).

(iii) Substrate: Weathered silty loams to stony clay, rocky ledges, little-weathered lava.

(iv) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus.*

(v) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia.*

(vi) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Sicyos.*

Family Apiaceae

Peucedanum sandwicense (MAKOU)

Maui—Coastal—Unit 1, Maui—Coastal—Unit 2, Maui—Coastal—Unit 3, Maui—Coastal—Unit 4, Maui—Coastal—Unit 5, Maui—Coastal—Unit 6, Maui—Coastal—Unit 7, Maui—Coastal—Unit 8, Maui—Lowland Wet—Unit 2, Maui—Lowland Wet—Unit 3, Maui—Lowland Wet—Unit 4, Maui—Lowland Wet—Unit 5, Maui—Lowland Wet—Unit 6, Maui—Lowland Wet—Unit 7, Maui—Lowland Wet—Unit 8, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Peucedanum sandwicense* on Maui.

(i) In units Maui—Coastal—Unit 1, Maui—Coastal—Unit 2, Maui—Coastal—Unit 3, Maui—Coastal—Unit 4, Maui—Coastal—Unit 5, Maui—Coastal—Unit 6, Maui—Coastal—Unit 7, and Maui—Coastal—Unit 8, the physical and biological features of critical habitat are:

(A) Elevation: Less than 980 ft (300 m).

(B) Annual precipitation: Less than 20 in (50 cm).

(C) Substrate: Well-drained, calcareous, talus slopes; weathered clay soils; ephemeral pools; mudflats.

(D) Canopy: *Hibiscus, Myoporum, Santalum, Scaevola.*

(E) Subcanopy: *Gossypium, Sida, Vitex.*

(F) Understory: *Eragrostis, Jacquemontia, Lyceum, Nama, Sesuvium, Sporobolus, Vigna.*

(ii) In units Maui—Lowland Wet—Unit 2, Maui—Lowland Wet—Unit 3, Maui—Lowland Wet—Unit 4, Maui—Lowland Wet—Unit 5, Maui—Lowland Wet—Unit 6, Maui—Lowland Wet—Unit 7, and Maui—Lowland Wet—Unit 8, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

Sanicula purpurea (NCN)

Maui—Montane Wet—Unit 6, Maui—Montane Wet—Unit 7, and Maui—Montane Wet—Unit 8, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Sanicula purpurea* on Maui. In units Maui—Montane Wet—Unit 6, Maui—Montane Wet—Unit 7, and Maui—Montane Wet—Unit 8, the physical and biological features of critical habitat are:

(i) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(ii) Annual precipitation: Greater than 75 in (190 cm).

(iii) Substrate: Well-developed soils, montane bogs.

(iv) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(v) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(vi) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

Spermolepis hawaiiensis (NCN)

Maui—Lowland Dry—Unit 1, Maui—Lowland Dry—Unit 2, Maui—Lowland Dry—Unit 3, Maui—Lowland Dry—Unit 4, Maui—Lowland Dry—Unit 5, and Maui—Lowland Dry—Unit 6, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Spermolepis hawaiiensis* on Maui. In units Maui—Lowland Dry—Unit 1, Maui—Lowland Dry—Unit 2, Maui—Lowland Dry—Unit 3, Maui—Lowland Dry—Unit 4, Maui—Lowland Dry—Unit 5, and Maui—Lowland Dry—Unit 6, the physical and biological features of critical habitat are:

(i) Elevation: Less than 3,300 ft (1,000 m).

(ii) Annual precipitation: Less than 50 in (130 cm).

(iii) Substrate: Weathered silty loams to stony clay, rocky ledges, little-weathered lava.

(iv) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus.*

(v) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia.*

(vi) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Sicyos.*

Family Asteraceae

Argyroxiphium sandwicense ssp. macrocephalum (AHINAHINA)

Maui—Montane Mesic—Unit 1, Maui—Subalpine—Unit 1, Maui—Subalpine—Unit 2, and Maui—Alpine—Unit 1, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Argyroxiphium sandwicense* ssp. *macrocephalum* on Maui.

(i) In unit Maui—Montane Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: 15 to 40 in (38 to 100 cm).

(C) Substrate: Deep ash deposits, thin silty loams.

(D) Canopy: *Acacia, Ilex, Metrosideros, Myrsine, Nestegis, Nothocestrum, Pisonia, Pittosporum, Psychotria, Sophora, Zanthoxylum.*

(E) Subcanopy: *Alyxia, Charpentiera, Coprosma, Dodonaea, Kadua, Labordia, Leptecophylla, Phyllostegia, Vaccinium.*

(F) Understory: Ferns, *Carex, Peperomia.*

(ii) In units Maui—Subalpine—Unit 1 and Maui—Subalpine—Unit 2, the physical and biological features of critical habitat are:

(A) Elevation: 6,500 to 9,800 ft (2,000 to 3,000 m).

(B) Annual precipitation: 15 to 40 in (38 to 100 cm).

(C) Substrate: Dry ash; sandy loam; rocky, undeveloped soils; weathered lava.

(D) Canopy: *Chamaesyce, Chenopodium, Metrosideros, Myoporum, Santalum, Sophora.*

(E) Subcanopy: *Coprosma, Dodonaea, Dubautia, Geranium, Leptecophylla, Vaccinium, Wikstroemia.*

(F) Understory: Ferns, *Bidens, Carex, Deschampsia, Eragrostis, Gahnia, Luzula, Panicum, Pseudognaphalium, Sicyos, Tetramolopium.*

(iii) In unit Maui—Alpine—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: Greater than 9,800 ft (3,000 m).

(B) Annual precipitation: 30 to 50 in (75 to 125 cm).

(C) Substrate: Barren gravel, debris, cinders.

(D) Canopy: None.

(E) Subcanopy: *Argyroxiphium, Dubautia, Silene, Tetramolopium.*

(F) Understory: None.

Bidens campylotheca ssp. pentamera (KOOKOOLAU)

Maui—Lowland Dry—Unit 5, Maui—Lowland Dry—Unit 6, Maui—Lowland Mesic—Unit 2, Maui—Lowland Mesic—Unit 3, Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2, Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, Maui—Montane Wet—Unit 5, Maui—Montane Mesic—Unit 1, Maui—Dry Cliff—Unit 1, Maui—Dry Cliff—Unit 2, Maui—Dry Cliff—Unit 3, Maui—Dry Cliff—Unit 4, Maui—Wet Cliff—Unit 1, Maui—Wet Cliff—Unit 2, Maui—Wet Cliff—Unit 3, Maui—Wet Cliff—Unit 4, Maui—Wet Cliff—Unit 5, Maui—Wet Cliff—Unit 6, Maui—Wet Cliff—Unit 7, and Maui—Wet Cliff—Unit 8, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Bidens campylotheca* ssp. *pentamera* on Maui.

(i) In units Maui—Lowland Dry—Unit 5 and Maui—Lowland Dry—Unit 6, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Less than 50 in (130 cm).

(C) Substrate: Weathered silty loams to stony clay, rocky ledges, little-weathered lava.

(D) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus.*

(E) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia.*

(F) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Sicyos.*

(ii) In units Maui—Lowland Mesic—Unit 2 and Maui—Lowland Mesic—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Shallow soils, little to no herbaceous layer.

(D) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(E) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(F) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

(iii) In units Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2, Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, and Maui—Montane Wet—Unit 5, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Well-developed soils, montane bogs.

(D) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(E) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(F) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

(iv) In unit Maui—Montane Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Deep ash deposits, thin silty loams.

(D) Canopy: *Acacia, Ilex, Metrosideros, Myrsine, Nestegis, Nothocestrum, Pisonia, Pittosporum, Psychotria, Sophora, Zanthoxylum.*

(E) Subcanopy: *Alyxia, Charpentiera, Coprosma, Dodonaea, Kadua, Labordia, Leptecophylla, Phyllostegia, Vaccinium.*

(F) Understory: Ferns, *Carex, Peperomia.*

(v) In units Maui—Dry Cliff—Unit 1, Maui—Dry Cliff—Unit 2, Maui—Dry Cliff—Unit 3, and Maui—Dry Cliff—Unit 4, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Less than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, rocky talus.

(D) Canopy: None.

(E) Subcanopy: *Antidesma, Chamaesyce, Diospyros, Dodonaea.*

(F) Understory: *Bidens, Eragrostis, Melanthera, Schiedea.*

(vi) In units Maui—Wet Cliff—Unit 1, Maui—Wet Cliff—Unit 2, Maui—Wet Cliff—Unit 3, Maui—Wet Cliff—Unit 4, Maui—Wet Cliff—Unit 5, Maui—Wet Cliff—Unit 6, Maui—Wet Cliff—Unit 7, and Maui—Wet Cliff—Unit 8, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.

(D) Canopy: None.

(E) Subcanopy: *Broussaisia, Cheirodendron, Leptocophylla, Metrosideros.*

(F) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Bidens campylotheca ssp. waihoiensis (KOOKOOLAU)

Maui—Lowland Wet—Unit 1, Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2, Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, Maui—Montane Wet—Unit 5, Maui—Wet Cliff—Unit 1, Maui—Wet Cliff—Unit 2, Maui—Wet Cliff—Unit 3, and Maui—Wet Cliff—Unit 4, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Bidens campylotheca* ssp. *waihoiensis* on Maui.

(i) In unit Maui—Lowland Wet—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

(ii) In units Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2, Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, and Maui—Montane Wet—Unit 5, and the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Well-developed soils, montane bogs.

(D) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(E) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(F) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

(iii) In units Maui—Wet Cliff—Unit 1, Maui—Wet Cliff—Unit 2, Maui—Wet Cliff—Unit 3, and Maui—Wet Cliff—Unit 4, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.

(D) Canopy: None.

(E) Subcanopy: *Broussaisia, Cheirodendron, Leptocophylla, Metrosideros.*

(F) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Bidens conjuncta (KOOKOOLAU)

Maui—Lowland Wet—Unit 2, Maui—Lowland Wet—Unit 3, Maui—Lowland Wet—Unit 4, Maui—Lowland Wet—Unit 5, Maui—Lowland Wet—Unit 6, Maui—Lowland Wet—Unit 7, Maui—Lowland Wet—Unit 8, Maui—Montane Wet—Unit 6, Maui—Montane Wet—Unit 7, Maui—Montane Wet—Unit 8, Maui—Wet Cliff—Unit 5, Maui—Wet Cliff—Unit 6, Maui—Wet Cliff—Unit 7, and Maui—Wet Cliff—Unit 8, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Bidens conjuncta* on Maui.

(i) In units Maui—Lowland Wet—Unit 2, Maui—Lowland Wet—Unit 3, Maui—Lowland Wet—Unit 4, Maui—Lowland Wet—Unit 5, Maui—Lowland Wet—Unit 6, Maui—Lowland Wet—Unit 7, and Maui—Lowland Wet—Unit 8, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

(ii) In units Maui—Montane Wet—Unit 6, Maui—Montane Wet—Unit 7, and Maui—Montane Wet—Unit 8, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Well-developed soils, montane bogs.

(D) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(E) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(F) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

(iii) In units Maui—Wet Cliff—Unit 5, Maui—Wet Cliff—Unit 6, Maui—Wet Cliff—Unit 7, and Maui—Wet Cliff—Unit 8, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.

(D) Canopy: None.

(E) Subcanopy: *Broussaisia, Cheirodendron, Leptocophylla, Metrosideros.*

(F) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Bidens micrantha ssp. kalealaha (KOOKOOLAU)

Maui—Lowland Dry—Unit 1, Maui—Lowland Dry—Unit 2, Maui—Lowland Dry—Unit 3, Maui—Lowland Dry—Unit 4, Maui—Lowland Wet—Unit 2, Maui—Lowland Wet—Unit 3, Maui—Lowland Wet—Unit 4, Maui—Lowland Wet—Unit 5, Maui—Lowland Wet—Unit 6, Maui—Lowland Wet—Unit 7, Maui—Lowland Wet—Unit 8, Maui—Montane Mesic—Unit 1, Maui—Subalpine—Unit 1, and Maui—Subalpine—Unit 2, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Bidens micrantha* ssp. *kalealaha* on Maui.

(i) In units Maui—Lowland Dry—Unit 1, Maui—Lowland Dry—Unit 2, Maui—Lowland Dry—Unit 3, and Maui—Lowland Dry—Unit 4, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Less than 50 in (130 cm).

(C) Substrate: Weathered silty loams to stony clay, rocky ledges, little-weathered lava.

(D) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus.*

(E) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia.*

(F) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Sicyos.*

(ii) In units Maui—Lowland Wet—Unit 2, Maui—Lowland Wet—Unit 3, Maui—Lowland Wet—Unit 4, Maui—Lowland Wet—Unit 5, Maui—Lowland Wet—Unit 6, Maui—Lowland Wet—Unit 7, and Maui—Lowland Wet—Unit 8, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

(iii) In unit Maui—Montane Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Deep ash deposits, thin silty loams.

(D) Canopy: *Acacia, Ilex, Metrosideros, Myrsine, Nestegis, Nothocestrum, Pisonia, Pittosporum, Psychotria, Sophora, Zanthoxylum.*

(E) Subcanopy: *Alyxia, Charpentiera, Coprosma, Dodonaea, Kadua, Labordia, Leptecophylla, Phyllostegia, Vaccinium.*

(F) Understory: Ferns, *Carex, Peperomia.*

(iv) In units Maui—Subalpine—Unit 1 and Maui—Subalpine—Unit 2, the physical and biological features of critical habitat are:

(A) Elevation: 6,500 to 9,800 ft (2,000 to 3,000 m).

(B) Annual precipitation: 15 to 40 in (38 to 100 cm).

(C) Substrate: Dry ash; sandy loam; rocky, undeveloped soils; weathered lava.

(D) Canopy: *Chamaesyce, Chenopodium, Metrosideros, Myoporum, Santalum, Sophora.*

(E) Subcanopy: *Coprosma, Dodonaea, Dubautia, Geranium, Leptecophylla, Vaccinium, Wikstroemia.*

(F) Understory: Ferns, *Bidens, Carex, Deschampsia, Eragrostis, Gahnia, Luzula, Panicum, Pseudognaphalium, Sicyos, Tetramolopium.*

Dubautia plantaginea ssp. humilis (NAENAE)

Maui—Wet Cliff—Unit 5, Maui—Wet Cliff—Unit 6, Maui—Wet Cliff—Unit 7, and Maui—Wet Cliff—Unit 8, identified

in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Dubautia plantaginea* ssp. *humilis* on Maui. In units Maui—Wet Cliff—Unit 5, Maui—Wet Cliff—Unit 6, Maui—Wet Cliff—Unit 7, and Maui—Wet Cliff—Unit 8, the physical and biological features of critical habitat are:

(i) Elevation: Unrestricted.

(ii) Annual precipitation: Greater than 75 in (190 cm).

(iii) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.

(iv) Canopy: None.

(v) Subcanopy: *Broussaisia, Cheirodendron, Leptocophylla, Metrosideros.*

(vi) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Hesperomannia arborescens (NCN)

Maui—Lowland Wet—Unit 2, Maui—Lowland Wet—Unit 3, Maui—Lowland Wet—Unit 4, Maui—Lowland Wet—Unit 5, Maui—Lowland Wet—Unit 6, Maui—Lowland Wet—Unit 7, Maui—Lowland Wet—Unit 8, Maui—Wet Cliff—Unit 5, Maui—Wet Cliff—Unit 6, Maui—Wet Cliff—Unit 7, and Maui—Wet Cliff—Unit 8, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Hesperomannia arborescens* on Maui.

(i) In units Maui—Lowland Wet—Unit 2, Maui—Lowland Wet—Unit 3, Maui—Lowland Wet—Unit 4, Maui—Lowland Wet—Unit 5, Maui—Lowland Wet—Unit 6, Maui—Lowland Wet—Unit 7, and Maui—Lowland Wet—Unit 8, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

(ii) In units Maui—Wet Cliff—Unit 5, Maui—Wet Cliff—Unit 6, Maui—Wet Cliff—Unit 7, and Maui—Wet Cliff—Unit 8, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.

(D) Canopy: None.

(E) Subcanopy: *Broussaisia, Cheirodendron, Leptocophylla, Metrosideros.*

(F) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Hesperomannia arbuscula (NCN)

Maui—Lowland Dry—Unit 5, Maui—Lowland Dry—Unit 6, Maui—Lowland Wet—Unit 2, Maui—Lowland Wet—Unit 3, Maui—Lowland Wet—Unit 4, Maui—Lowland Wet—Unit 5, Maui—Lowland Wet—Unit 6, Maui—Lowland Wet—Unit 7, Maui—Lowland Wet—Unit 8, Maui—Dry Cliff—Unit 5, Maui—Dry Cliff—Unit 6, Maui—Dry Cliff—Unit 7, Maui—Wet Cliff—Unit 5, Maui—Wet Cliff—Unit 6, Maui—Wet Cliff—Unit 7, and Maui—Wet Cliff—Unit 8, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Hesperomannia arbuscula* on Maui.

(i) In units Maui—Lowland Dry—Unit 5 and Maui—Lowland Dry—Unit 6, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Less than 50 in (130 cm).

(C) Substrate: Weathered silty loams to stony clay, rocky ledges, little-weathered lava.

(D) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus.*

(E) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia.*

(F) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Sicyos.*

(ii) In units Maui—Lowland Wet—Unit 2, Maui—Lowland Wet—Unit 3, Maui—Lowland Wet—Unit 4, Maui—Lowland Wet—Unit 5, Maui—Lowland Wet—Unit 6, Maui—Lowland Wet—Unit 7, and Maui—Lowland Wet—Unit 8, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

(iii) In units Maui—Dry Cliff—Unit 5, Maui—Dry Cliff—Unit 6, and Maui—Dry Cliff—Unit 7, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Less than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, rocky talus.

(D) Canopy: None.

(E) Subcanopy: *Antidesma, Chamaesyce, Diospyros, Dodonaea.*

(F) Understory: *Bidens, Eragrostis, Melanthera, Schiedea.*

(iv) In units Maui—Wet Cliff—Unit 5, Maui—Wet Cliff—Unit 6, Maui—Wet Cliff—Unit 7, and Maui—Wet Cliff—Unit 8, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.

(D) Canopy: None.

(E) Subcanopy: *Broussaisia, Cheirodendron, Leptocophylla, Metrosideros.*

(F) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Melanthera kamolensis (NEHE)

Maui—Lowland Dry—Unit 1, Maui—Lowland Dry—Unit 2, Maui—Lowland Dry—Unit 3, and Maui—Lowland Dry—Unit 4, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Melanthera kamolensis* on Maui. In units Maui—Lowland Dry—Unit 1, Maui—Lowland Dry—Unit 2, Maui—Lowland Dry—Unit 3, and Maui—Lowland Dry—Unit 4, the physical and biological features of critical habitat are:

(i) Elevation: Less than 3,300 ft (1,000 m).

(ii) Annual precipitation: Less than 50 in (130 cm).

(iii) Substrate: Weathered silty loams to stony clay, rocky ledges, little-weathered lava.

(iv) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus.*

(v) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia.*

(vi) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Sicyos.*

Remya mauiensis (MAUI REMYA)

Maui—Lowland Dry—Unit 5, Maui—Lowland Dry—Unit 6, Maui—Lowland Mesic—Unit 2, Maui—Lowland Mesic—Unit 3, Maui—Lowland Wet—Unit 2, Maui—Lowland Wet—Unit 3, Maui—Lowland Wet—Unit 4, Maui—Lowland Wet—Unit 5, Maui—Lowland Wet—Unit 6, Maui—Lowland Wet—Unit 7, Maui—Lowland Wet—Unit 8, Maui—Montane Mesic—Unit 2, Maui—Montane Mesic—Unit 3, Maui—Montane Mesic—Unit 4, Maui—Montane Mesic—Unit 5, Maui—Montane Mesic—Unit 6, Maui—Wet Cliff—Unit 5, Maui—Wet Cliff—Unit 6, Maui—Wet Cliff—Unit 7, and Maui—

Wet Cliff—Unit 8, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Remya mauiensis* on Maui.

(i) In units Maui—Lowland Dry—Unit 5 and Maui—Lowland Dry—Unit 6, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Less than 50 in (130 cm).

(C) Substrate: Weathered silty loams to stony clay, rocky ledges, little-weathered lava.

(D) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus.*

(E) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia.*

(F) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Sicyos.*

(ii) In units Maui—Lowland Mesic—Unit 2 and Maui—Lowland Mesic—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Shallow soils, little to no herbaceous layer.

(D) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(E) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(F) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

(iii) In units Maui—Lowland Wet—Unit 2, Maui—Lowland Wet—Unit 3, Maui—Lowland Wet—Unit 4, Maui—Lowland Wet—Unit 5, Maui—Lowland Wet—Unit 6, Maui—Lowland Wet—Unit 7, and Maui—Lowland Wet—Unit 8, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

(iv) In units Maui—Montane Mesic—Unit 2, Maui—Montane Mesic—Unit 3, Maui—Montane Mesic—Unit 4, Maui—Montane Mesic—Unit 5, and Maui—Montane Mesic—Unit 6, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Deep ash deposits, thin silty loams.

(D) Canopy: *Acacia, Ilex, Metrosideros, Myrsine, Nestegis, Nothocestrum, Pisonia, Pittosporum, Psychotria, Sophora, Zanthoxylum.*

(E) Subcanopy: *Alyxia, Charpentiera, Coprosma, Dodonaea, Kadua, Labordia, Leptecophylla, Phyllostegia, Vaccinium.*

(F) Understory: Ferns, *Carex, Peperomia.*

(v) In units Maui—Wet Cliff—Unit 5, Maui—Wet Cliff—Unit 6, Maui—Wet Cliff—Unit 7, and Maui—Wet Cliff—Unit 8, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.

(D) Canopy: None.

(E) Subcanopy: *Broussaisia, Cheirodendron, Leptocophylla, Metrosideros.*

(F) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Tetramolopium capillare (PAMAKANI)

Maui—Lowland Dry—Unit 5, Maui—Lowland Dry—Unit 6, Maui—Dry Cliff—Unit 5, Maui—Dry Cliff—Unit 6, Maui—Dry Cliff—Unit 7, Maui—Wet Cliff—Unit 5, Maui—Wet Cliff—Unit 6, Maui—Wet Cliff—Unit 7, and Maui—Wet Cliff—Unit 8, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Tetramolopium capillare* on Maui.

(i) In units Maui—Lowland Dry—Unit 5 and Maui—Lowland Dry—Unit 6, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Less than 50 in (130 cm).

(C) Substrate: Weathered silty loams to stony clay, rocky ledges, little-weathered lava.

(D) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus.*

(E) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia.*

(F) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Sicyos.*

(ii) In units Maui—Dry Cliff—Unit 5, Maui—Dry Cliff—Unit 6, and Maui—Dry Cliff—Unit 7, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Less than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, rocky talus.

(D) Canopy: None.

(E) Subcanopy: *Antidesma, Chamaesyce, Diospyros, Dodonaea.*

(F) Understory: *Bidens, Eragrostis, Melanthera, Schiedea.*

(iii) In units Maui—Wet Cliff—Unit 5, Maui—Wet Cliff—Unit 6, Maui—Wet Cliff—Unit 7, and Maui—Wet Cliff—Unit 8, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.

(D) Canopy: None.

(E) Subcanopy: *Broussaisia, Cheirodendron, Leptocophylla, Metrosideros.*

(F) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Tetramolopium remyi (NCN)

Maui—Lowland Dry—Unit 5 and Maui—Lowland Dry—Unit 6, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Tetramolopium remyi* on Maui. In units Maui—Lowland Dry—Unit 5 and Maui—Lowland Dry—Unit 6, the physical and biological features of critical habitat are:

(i) Elevation: Less than 3,300 ft (1,000 m).

(ii) Annual precipitation: Less than 50 in (130 cm).

(iii) Substrate: Weathered silty loams to stony clay, rocky ledges, little-weathered lava.

(iv) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus.*

(v) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia.*

(vi) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Sicyos.*

Family Campanulaceae

Brighamia rockii (PUA ALA)

Maui—Coastal—Unit 1, Maui—Coastal—Unit 2, Maui—Coastal—Unit 3, Maui—Coastal—Unit 4, Maui—Coastal—Unit 5, Maui—Coastal—Unit 6, Maui—Coastal—Unit 7, Maui—Coastal—Unit 8, Maui—Coastal—Unit 9, Maui—Coastal—Unit 10, and Maui—Coastal—Unit 11, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Brighamia rockii* on Maui. In units Maui—Coastal—Unit 1, Maui—Coastal—Unit 2, Maui—Coastal—Unit 3, Maui—Coastal—Unit 4, Maui—Coastal—Unit 5, Maui—Coastal—Unit 6,

Maui—Coastal—Unit 7, Maui—Coastal—Unit 8, Maui—Coastal—Unit 9, Maui—Coastal—Unit 10, and Maui—Coastal—Unit 11, the physical and biological features of critical habitat are:

(i) Elevation: Less than 980 ft (300 m).

(ii) Annual precipitation: Less than 20 in (50 cm).

(iii) Substrate: Well-drained, calcareous, talus slopes; weathered clay soils; ephemeral pools; mudflats.

(iv) Canopy: *Hibiscus, Myoporum, Santalum, Scaevola.*

(v) Subcanopy: *Gossypium, Sida, Vitex.*

(vi) Understory: *Eragrostis, Jacquemontia, Lyceum, Nama, Sesuvium, Sporobolus, Vigna.*

Clermontia lindseyana (OHA WAI)

Maui—Montane Mesic—Unit 1, identified in the legal descriptions in paragraph (e)(1) of this section, constitutes critical habitat for *Clermontia lindseyana* on Maui. In unit Maui—Montane Mesic—Unit 1, the physical and biological features of critical habitat are:

(i) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(ii) Annual precipitation: 50 to 75 in (130 to 190 cm).

(ii) Substrate: Deep ash deposits, thin silty loams.

(iv) Canopy: *Acacia, Ilex, Metrosideros, Myrsine, Nestegis, Nothocestrum, Pisonia, Pittosporum, Psychotria, Sophora, Zanthoxylum.*

(v) Subcanopy: *Alyxia, Charpentiera, Coprosma, Dodonaea, Kadua, Labordia, Leptecophylla, Phyllostegia, Vaccinium.*

(vi) Understory: Ferns, *Carex, Peperomia.*

Clermontia oblongifolia ssp. *mauiensis* (OHA WAI)

Maui—Lowland Wet—Unit 1, Maui—Lowland Wet—Unit 2, Maui—Lowland Wet—Unit 3, Maui—Lowland Wet—Unit 4, Maui—Lowland Wet—Unit 5, Maui—Lowland Wet—Unit 6, Maui—Lowland Wet—Unit 7, Maui—Lowland Wet—Unit 8, Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2, Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, and Maui—Montane Wet—Unit 5, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Clermontia oblongifolia* ssp. *mauiensis* on Maui.

(i) In units Maui—Lowland Wet—Unit 1, Maui—Lowland Wet—Unit 2, Maui—Lowland Wet—Unit 3, Maui—Lowland Wet—Unit 4, Maui—Lowland Wet—Unit 5, Maui—Lowland Wet—Unit 6, Maui—Lowland Wet—Unit 7, and Maui—Lowland Wet—Unit 8, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

(ii) In units Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2, Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, and Maui—Montane Wet—Unit 5, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Well-developed soils, montane bogs.

(D) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(E) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(F) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

Clermontia peleana (OHA WAI)

Maui—Lowland Wet—Unit 1, identified in the legal descriptions in paragraph (e)(1) of this section, constitutes critical habitat for *Clermontia peleana* on Maui. In unit Maui—Lowland Wet—Unit 1, the physical and biological features of critical habitat are:

(i) Elevation: Less than 3,300 ft (1,000 m).

(ii) Annual precipitation: Greater than 75 in (190 cm).

(iii) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(iv) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(v) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(vi) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

Clermontia samuelii (OHA WAI)

Maui—Lowland Wet—Unit 1, Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2, Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, and Maui—Montane Wet—Unit 5, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Clermontia samuelii* on Maui.

(i) In unit Maui—Lowland Wet—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

(ii) In units Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2, Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, and Maui—Montane Wet—Unit 5, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Well-developed soils, montane bogs.

(D) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(E) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(F) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

Cyanea asplenifolia (HAHA)

Maui—Lowland Mesic—Unit 1, Maui—Lowland Wet—Unit 1, Maui—Lowland Wet—Unit 2, Maui—Lowland Wet—Unit 3, Maui—Lowland Wet—Unit 4, Maui—Lowland Wet—Unit 5, Maui—Lowland Wet—Unit 6, Maui—Lowland Wet—Unit 7, and Maui—Lowland Wet—Unit 8, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Cyanea asplenifolia* on Maui.

(i) In unit Maui—Lowland Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Shallow soils, little to no herbaceous layer.

(D) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(E) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(F) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

(ii) In units Maui—Lowland Wet—Unit 1, Maui—Lowland Wet—Unit 2, Maui—Lowland Wet—Unit 3, Maui—Lowland Wet—Unit 4, Maui—Lowland Wet—Unit 5, Maui—Lowland Wet—Unit 6, Maui—Lowland Wet—Unit 7, and Maui—Lowland Wet—Unit 8, the

physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

Cyanea copelandii ssp. *haleakalaensis* (HAHA)

Maui—Lowland Mesic—Unit 1, Maui—Lowland Wet—Unit 1, Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2, Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, Maui—Montane Wet—Unit 5, Maui—Wet Cliff—Unit 1, Maui—Wet Cliff—Unit 2, Maui—Wet Cliff—Unit 3, and Maui—Wet Cliff—Unit 4, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Cyanea copelandii* ssp. *haleakalaensis* on Maui.

(i) In unit Maui—Lowland Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Shallow soils, little to no herbaceous layer.

(D) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(E) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(F) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

(ii) In unit Maui—Lowland Wet—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

(iii) In units Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2, Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, and Maui—Montane Wet—Unit 5, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Well-developed soils, montane bogs.

(D) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(E) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(F) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

(iv) In units Maui—Wet Cliff—Unit 1, Maui—Wet Cliff—Unit 2, Maui—Wet Cliff—Unit 3, and Maui—Wet Cliff—Unit 4, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.

(D) Canopy: None.

(E) Subcanopy: *Broussaisia, Cheirodendron, Leptocophylla, Metrosideros.*

(F) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Cyanea duvalliorum (HAHA)

Maui—Lowland Wet—Unit 1, Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2, Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, and Maui—Montane Wet—Unit 5, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Cyanea duvalliorum* on Maui.

(i) In unit Maui—Lowland Wet—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

(ii) In units Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2, Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, and Maui—Montane Wet—Unit 5, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Well-developed soils, montane bogs.

(D) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(E) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(F) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

Cyanea glabra (HAHA)

Maui—Lowland Wet—Unit 2, Maui—Lowland Wet—Unit 3, Maui—Lowland Wet—Unit 4, Maui—Lowland Wet—Unit 5, Maui—Lowland Wet—Unit 6, Maui—Lowland Wet—Unit 7, Maui—Lowland Wet—Unit 8, Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2, Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, Maui—Montane Wet—Unit 5, Maui—Montane Mesic—Unit 1, Maui—Wet Cliff—Unit 5, Maui—Wet Cliff—Unit 6, Maui—Wet Cliff—Unit 7, and Maui—Wet Cliff—Unit 8, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Cyanea glabra* on Maui.

(i) In units Maui—Lowland Wet—Unit 2, Maui—Lowland Wet—Unit 3, Maui—Lowland Wet—Unit 4, Maui—Lowland Wet—Unit 5, Maui—Lowland Wet—Unit 6, Maui—Lowland Wet—Unit 7, and Maui—Lowland Wet—Unit 8, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

(ii) In units Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2, Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, and Maui—Montane Wet—Unit 5, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Well-developed soils, montane bogs.

(D) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(E) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(F) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

(iii) In unit Maui—Montane Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Deep ash deposits, thin silty loams.

(D) Canopy: *Acacia, Ilex, Metrosideros, Myrsine, Nestegis, Nothocestrum, Pisonia, Pittosporum, Psychotria, Sophora, Zanthoxylum.*

(E) Subcanopy: *Alyxia, Charpentiera, Coprosma, Dodonaea, Kadua, Labordia, Leptecophylla, Phyllostegia, Vaccinium.*

(F) Understory: Ferns, *Carex, Peperomia.*

(iv) In units Maui—Wet Cliff—Unit 5, Maui—Wet Cliff—Unit 6, Maui—Wet Cliff—Unit 7, and Maui—Wet Cliff—Unit 8, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.

(D) Canopy: None.

(E) Subcanopy: *Broussaisia, Cheirodendron, Leptocophylla, Metrosideros.*

(F) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Cyanea hamatiflora ssp. *hamatiflora* (HAHA)

Maui—Lowland Wet—Unit 1, Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2, Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, Maui—Montane Wet—Unit 5, and Maui—Montane Mesic—Unit 1, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Cyanea hamatiflora* ssp. *hamatiflora* on Maui.

(i) In unit Maui—Lowland Wet—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

(ii) In units Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2, Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, and Maui—Montane Wet—Unit 5, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Well-developed soils, montane bogs.

(D) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(E) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(F) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

(iii) In unit Maui—Montane Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Deep ash deposits, thin silty loams.

(D) Canopy: *Acacia, Ilex, Metrosideros, Myrsine, Nestegis, Nothocestrum, Pisonia, Pittosporum, Psychotria, Sophora, Zanthoxylum.*

(E) Subcanopy: *Alyxia, Charpentiera, Coprosma, Dodonaea, Kadua, Labordia, Leptecophylla, Phyllostegia, Vaccinium.*

(F) Understory: Ferns, *Carex, Peperomia.*

Cyanea horrida (HAHA)

Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2, Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, Maui—Montane Wet—Unit 5, Maui—Montane Mesic—Unit 1, Maui—Wet Cliff—Unit 1, Maui—Wet Cliff—Unit 2, Maui—Wet Cliff—Unit 3, and Maui—Wet Cliff—Unit 4, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Cyanea horrida* on Maui.

(i) In units Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2, Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, and Maui—Montane Wet—Unit 5, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Well-developed soils, montane bogs.

(D) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(E) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(F) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

(ii) In unit Maui—Montane Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Deep ash deposits, thin silty loams.

(D) Canopy: *Acacia, Ilex, Metrosideros, Myrsine, Nestegis, Nothocestrum, Pisonia, Pittosporum, Psychotria, Sophora, Zanthoxylum.*

(E) Subcanopy: *Alyxia, Charpentiera, Coprosma, Dodonaea, Kadua, Labordia, Leptecophylla, Phyllostegia, Vaccinium.*

(F) Understory: Ferns, *Carex, Peperomia.*

(iii) In units Maui—Wet Cliff—Unit 1, Maui—Wet Cliff—Unit 2, Maui—Wet Cliff—Unit 3, and Maui—Wet Cliff—Unit 4, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.

(D) Canopy: None.

(E) Subcanopy: *Broussaisia, Cheirodendron, Leptocophylla, Metrosideros.*

(F) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Cyanea kunthiana (HAHA)

Maui—Lowland Wet—Unit 1, Maui—Lowland Wet—Unit 2, Maui—Lowland Wet—Unit 3, Maui—Lowland Wet—Unit 4, Maui—Lowland Wet—Unit 5, Maui—Lowland Wet—Unit 6, Maui—Lowland Wet—Unit 7, Maui—Lowland Wet—Unit 8, Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2, Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, Maui—Montane Wet—Unit 5, Maui—Montane Wet—Unit 6, Maui—Montane Wet—Unit 7, Maui—Montane Wet—Unit 8, and Maui—Montane Mesic—Unit 1, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Cyanea kunthiana* on Maui.

(i) In units Maui—Lowland Wet—Unit 1, Maui—Lowland Wet—Unit 2, Maui—Lowland Wet—Unit 3, Maui—Lowland Wet—Unit 4, Maui—Lowland Wet—Unit 5, Maui—Lowland Wet—Unit 6, Maui—Lowland Wet—Unit 7, and Maui—Lowland Wet—Unit 8, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

(ii) In units Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2,

Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, Maui—Montane Wet—Unit 5, Maui—Montane Wet—Unit 6, Maui—Montane Wet—Unit 7, and Maui—Montane Wet—Unit 8, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Well-developed soils, montane bogs.

(D) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(E) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(F) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

(iii) In unit Maui—Montane Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Deep ash deposits, thin silty loams.

(D) Canopy: *Acacia, Ilex, Metrosideros, Myrsine, Nestegis, Nothocestrum, Pisonia, Pittosporum, Psychotria, Sophora, Zanthoxylum.*

(E) Subcanopy: *Alyxia, Charpentiera, Coprosma, Dodonaea, Kadua, Labordia, Leptecophylla, Phyllostegia, Vaccinium.*

(F) Understory: Ferns, *Carex, Peperomia.*

Cyanea lobata (HAHA)

Maui—Lowland Wet—Unit 2, Maui—Lowland Wet—Unit 3, Maui—Lowland Wet—Unit 4, Maui—Lowland Wet—Unit 5, Maui—Lowland Wet—Unit 6, Maui—Lowland Wet—Unit 7, Maui—Lowland Wet—Unit 8, Maui—Wet Cliff—Unit 5, Maui—Wet Cliff—Unit 6, Maui—Wet Cliff—Unit 7, and Maui—Wet Cliff—Unit 8, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Cyanea lobata* ssp. *lobata* on Maui.

(i) In units Maui—Lowland Wet—Unit 2, Maui—Lowland Wet—Unit 3, Maui—Lowland Wet—Unit 4, Maui—Lowland Wet—Unit 5, Maui—Lowland Wet—Unit 6, Maui—Lowland Wet—Unit 7, and Maui—Lowland Wet—Unit 8, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

(ii) In units Maui—Wet Cliff—Unit 5, Maui—Wet Cliff—Unit 6, Maui—Wet Cliff—Unit 7, and Maui—Wet Cliff—Unit 8, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.

(D) Canopy: None.

(E) Subcanopy: *Broussaisia, Cheirodendron, Leptocophylla, Metrosideros.*

(F) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Cyanea magnicalyx (HAHA)

Maui—Lowland Wet—Unit 2, Maui—Lowland Wet—Unit 3, Maui—Lowland Wet—Unit 4, Maui—Lowland Wet—Unit 5, Maui—Lowland Wet—Unit 6, Maui—Lowland Wet—Unit 7, Maui—Lowland Wet—Unit 8, Maui—Montane Mesic—Unit 2, Maui—Montane Mesic—Unit 3, Maui—Montane Mesic—Unit 4, Maui—Montane Mesic—Unit 5, Maui—Montane Mesic—Unit 6, Maui—Wet Cliff—Unit 5, Maui—Wet Cliff—Unit 6, Maui—Wet Cliff—Unit 7, and Maui—Wet Cliff—Unit 8, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Cyanea magnicalyx* on Maui.

(i) In units Maui—Lowland Wet—Unit 2, Maui—Lowland Wet—Unit 3, Maui—Lowland Wet—Unit 4, Maui—Lowland Wet—Unit 5, Maui—Lowland Wet—Unit 6, Maui—Lowland Wet—Unit 7, and Maui—Lowland Wet—Unit 8, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

(ii) In units Maui—Montane Mesic—Unit 2, Maui—Montane Mesic—Unit 3, Maui—Montane Mesic—Unit 4, Maui—Montane Mesic—Unit 5, and Maui—Montane Mesic—Unit 6, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Deep ash deposits, thin silty loams.

(D) Canopy: *Acacia, Ilex, Metrosideros, Myrsine, Nestegis, Nothocestrum, Pisonia, Pittosporum, Psychotria, Sophora, Zanthoxylum.*

(E) Subcanopy: *Alyxia, Charpentiera, Coprosma, Dodonaea, Kadua, Labordia, Leptecophylla, Phyllostegia, Vaccinium.*

(F) Understory: Ferns, *Carex, Peperomia.*

(iii) In units Maui—Wet Cliff—Unit 5, Maui—Wet Cliff—Unit 6, Maui—Wet Cliff—Unit 7, and Maui—Wet Cliff—Unit 8, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.

(D) Canopy: None.

(E) Subcanopy: *Broussaisia, Cheirodendron, Leptocophylla, Metrosideros.*

(F) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Cyanea maritae (HAHA)

Maui—Lowland Wet—Unit 1, Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2, Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, and Maui—Montane Wet—Unit 5, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Cyanea maritae* on Maui.

(i) In unit Maui—Lowland Wet—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

(ii) In units Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2, Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, and Maui—Montane Wet—Unit 5, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Well-developed soils, montane bogs.

(D) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(E) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(F) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

Cyanea mceldowneyi (HAHA)

Maui—Lowland Wet—Unit 1, Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2, Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, Maui—Montane Wet—Unit 5, and Maui—Montane Mesic—Unit 1, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Cyanea mceldowneyi* on Maui.

(i) In unit Maui—Lowland Wet—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

(ii) In units Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2, Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, and Maui—Montane Wet—Unit 5, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Well-developed soils, montane bogs.

(D) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(E) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(F) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

(iii) In unit Maui—Montane Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Deep ash deposits, thin silty loams.

(D) Canopy: *Acacia, Ilex, Metrosideros, Myrsine, Nestegis, Nothocestrum, Pisonia, Pittosporum, Psychotria, Sophora, Zanthoxylum.*

(E) Subcanopy: *Alyxia, Charpentiera, Coprosma, Dodonaea, Kadua, Labordia, Leptecophylla, Phyllostegia, Vaccinium.*

(F) Understory: Ferns, *Carex, Peperomia.*

Cyanea obtusa (HAHA)

Maui—Lowland Dry—Unit 5, Maui—Lowland Dry—Unit 6, and Maui—Montane Mesic—Unit 1, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Cyanea obtusa* on Maui.

(i) In units Maui—Lowland Dry—Unit 5 and Maui—Lowland Dry—Unit 6, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Less than 50 in (130 cm).

(C) Substrate: Weathered silty loams to stony clay, rocky ledges, little-weathered lava.

(D) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus.*

(E) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia.*

(F) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Sicyos.*

(ii) In unit Maui—Montane Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Deep ash deposits, thin silty loams.

(D) Canopy: *Acacia, Ilex, Metrosideros, Myrsine, Nestegis, Nothocestrum, Pisonia, Pittosporum, Psychotria, Sophora, Zanthoxylum.*

(E) Subcanopy: *Alyxia, Charpentiera, Coprosma, Dodonaea, Kadua, Labordia, Leptecophylla, Phyllostegia, Vaccinium.*

(F) Understory: Ferns, *Carex, Peperomia.*

Family Caryophyllaceae

Schiedea haleakalensis (NCN)

Maui—Subalpine—Unit 1, Maui—Subalpine—Unit 2, Maui—Dry Cliff—Unit 1, Maui—Dry Cliff—Unit 2, Maui—Dry Cliff—Unit 3, and Maui—Dry Cliff—Unit 4, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Schiedea haleakalensis* on Maui.

(i) In units Maui—Subalpine—Unit 1 and Maui—Subalpine—Unit 2, the physical and biological features of critical habitat are:

(A) Elevation: 6,500 to 9,800 ft (2,000 to 3,000 m).

(B) Annual precipitation: 15 to 40 in (38 to 100 cm).

(C) Substrate: Dry ash; sandy loam; rocky, undeveloped soils; weathered lava.

(D) Canopy: *Chamaesyce, Chenopodium, Metrosideros, Myoporum, Santalum, Sophora.*

(E) Subcanopy: *Coprosma, Dodonaea, Dubautia, Geranium, Leptecophylla, Vaccinium, Wikstroemia.*

(F) Understory: Ferns, *Bidens, Carex, Deschampsia, Eragrostis, Gahnia, Luzula, Panicum, Pseudognaphalium, Sicyos, Tetramolopium.*

(ii) In units Maui—Dry Cliff—Unit 1, Maui—Dry Cliff—Unit 2, Maui—Dry Cliff—Unit 3, and Maui—Dry Cliff—Unit 4, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Less than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, rocky talus.

(D) Canopy: None.

(E) Subcanopy: *Antidesma, Chamaesyce, Diospyros, Dodonaea.*

(F) Understory: *Bidens, Eragrostis, Melanthera, Schiedea.*

Schiedea jacobii (NCN)

Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2, Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, and Maui—Montane Wet—Unit 5, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Schiedea jacobii* on Maui. In units Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2, Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, and Maui—Montane Wet—Unit 5, the physical and biological features of critical habitat are:

(i) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(ii) Annual precipitation: Greater than 75 in (190 cm).

(iii) Substrate: Well-developed soils, montane bogs.

(iv) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(v) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(vi) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

Schiedea salicaria (NCN)

Maui—Lowland Dry—Unit 5 and Maui—Lowland Dry—Unit 6, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Schiedea salicaria* on Maui. In units Maui—Lowland Dry—Unit 5 and Maui—Lowland Dry—Unit 6, the physical and biological features of critical habitat are:

(i) Elevation: Less than 3,300 ft (1,000 m).

(ii) Annual precipitation: Less than 50 in (130 cm).

(iii) Substrate: Weathered silty loams to stony clay, rocky ledges, little-weathered lava.

(iv) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus.*

(v) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia.*

(vi) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Sicyos.*

Family Convolvulaceae

Bonamia menziesii (NCN)

Maui—Lowland Dry—Unit 1, Maui—Lowland Dry—Unit 2, Maui—Lowland Dry—Unit 3, Maui—Lowland Dry—Unit 4, Maui—Dry Cliff—Unit 5, Maui—Dry Cliff—Unit 6, Maui—Dry Cliff—Unit 7, Maui—Wet Cliff—Unit 5, Maui—Wet Cliff—Unit 6, Maui—Wet Cliff—Unit 7, and Maui—Wet Cliff—Unit 8, identified in the legal descriptions in paragraph (e)(1) of this section, constitutes critical habitat for *Bonamia menziesii* on Maui.

(i) In units Maui—Lowland Dry—Unit 1, Maui—Lowland Dry—Unit 2, Maui—Lowland Dry—Unit 3, and Maui—Lowland Dry—Unit 4, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Less than 50 in (130 cm).

(C) Substrate: Weathered silty loams to stony clay, rocky ledges, little-weathered lava.

(D) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus.*

(E) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia.*

(F) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Sicyos.*

(ii) In units Maui—Dry Cliff—Unit 5, Maui—Dry Cliff—Unit 6, and Maui—Dry Cliff—Unit 7, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Less than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, rocky talus.

(D) Canopy: None.

(E) Subcanopy: *Antidesma, Chamaesyce, Diospyros, Dodonaea.*

(F) Understory: *Bidens, Eragrostis, Melanthera, Schiedea.*

(iii) In units Maui—Wet Cliff—Unit 5, Maui—Wet Cliff—Unit 6, Maui—Wet Cliff—Unit 7, and Maui—Wet Cliff—Unit 8, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.

(D) Canopy: None.

(E) Subcanopy: *Broussaisia, Cheirodendron, Leptocophylla, Metrosideros.*

(F) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Family Cyperaceae

Cyperus pennatiformis (NCN)

Maui—Coastal—Unit 1, Maui—Coastal—Unit 2, Maui—Coastal—Unit 3, Maui—Coastal—Unit 4, Maui—Coastal—Unit 5, Maui—Coastal—Unit 6, Maui—Coastal—Unit 7, and Maui—Coastal—Unit 8, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Cyperus pennatiformis* ssp. *pennatiformis* on Maui.In units Maui—Coastal—Unit 1, Maui—Coastal—Unit 2, Maui—Coastal—Unit 3, Maui—Coastal—Unit 4, Maui—Coastal—Unit 5, Maui—Coastal—Unit 6, Maui—Coastal—Unit 7, and Maui—Coastal—Unit 8, the physical and biological features of critical habitat are:

(i) Elevation: Less than 980 ft (300 m).

(ii) Annual precipitation: Less than 20 in (50 cm).

(iii) Substrate: Well-drained, calcareous, talus slopes; weathered clay soils; ephemeral pools; mudflats.

(iv) Canopy: *Hibiscus, Myoporum, Santalum, Scaevola.*

(v) Subcanopy: *Gossypium, Sida, Vitex.*

(vi) Understory: *Eragrostis, Jacquemontia, Lyceum, Nama, Sesuvium, Sporobolus, Vigna.*

Family Euphorbiaceae

Flueggea neowawraea (MEHAMEHAME)

Maui—Lowland Dry—Unit 1, Maui—Lowland Dry—Unit 2, Maui—Lowland Dry—Unit 3, and Maui—Lowland Dry—Unit 4, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Flueggea neowawraea* on Maui. In units Maui—Lowland Dry—Unit 1, Maui—Lowland Dry—Unit 2, Maui—Lowland Dry—Unit 3, and Maui—Lowland Dry—Unit 4, the physical and biological features of critical habitat are:

(i) Elevation: Less than 3,300 ft (1,000 m).

(ii) Annual precipitation: Less than 50 in (130 cm).

(iii) Substrate: Weathered silty loams to stony clay, rocky ledges, little-weathered lava.

(iv) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus.*

(v) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia.*

(vi) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Sicyos.*

Family Fabaceae

Canavalia pubescens (AWIKIWIKI)

Maui—Lowland Dry—Unit 1, Maui—Lowland Dry—Unit 2, Maui—Lowland Dry—Unit 3, and Maui—Lowland Dry—Unit 4, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Canavalia pubescens* on Maui. In units Maui—Lowland Dry—Unit 1, Maui—Lowland Dry—Unit 2, Maui—Lowland Dry—Unit 3, Maui—Lowland Dry—Unit 4, the physical and biological features of critical habitat are:

(i) Elevation: Less than 3,300 ft (1,000 m).

(ii) Annual precipitation: Less than 50 in (130 cm).

(iii) Substrate: Weathered silty loams to stony clay, rocky ledges, little-weathered lava.

(iv) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus.*

(v) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia.*

(vi) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Sicyos.*

Kanaloa kahoolawensis (KOHE MALAMA MALAMA O KANALOA)

Kahoolawe—Coastal—Unit 1, Kahoolawe—Coastal—Unit 2, Kahoolawe—Coastal—Unit 3, Kahoolawe—Lowland Dry—Unit 1, and Kahoolawe—Lowland Dry—Unit 2, identified in the legal descriptions in paragraph (e)(2) of this section, constitute critical habitat for *Kanaloa kahoolawensis* on Kahoolawe.

(i) In units Kahoolawe—Coastal—Unit 1, Kahoolawe—Coastal—Unit 2, and Kahoolawe—Coastal—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: Less than 980 ft (300 m).

(B) Annual precipitation: Less than 20 in (50 cm).

(C) Substrate: Well-drained, calcareous, talus slopes; weathered clay soils; ephemeral pools; mudflats.

(D) Canopy: *Hibiscus, Myoporum, Santalum, Scaevola.*

(E) Subcanopy: *Gossypium, Sida, Vitex.*

(F) Understory: *Eragrostis, Jacquemontia, Lyceum, Nama, Sesuvium, Sporobolus, Vigna.*

(ii) In units Kahoolawe—Lowland Dry—Unit 1 and Kahoolawe—Lowland Dry—Unit 2, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Less than 50 in (130 cm).

(C) Substrate: Weathered silty loams to stony clay, rocky ledges, little-weathered lava.

(D) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus.*

(E) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia.*

(F) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Sicyos.*

Mucuna sloanei var. *persericea* (SEA BEAN)

Maui—Lowland Wet—Unit 1, identified in the legal descriptions in paragraph (e)(1) of this section, constitutes critical habitat for *Mucuna sloanei* var. *persericea* on Maui. In unit Maui—Lowland Wet—Unit 1, the physical and biological features of critical habitat are:

(i) Elevation: Less than 3,300 ft (1,000 m).

(ii Annual precipitation: Greater than 75 in (190 cm).

(iii) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(iv) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(v) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(vi) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

Sesbania tomentosa (OHAI)

Maui—Coastal—Unit 9, Maui—Coastal—Unit 10, Maui—Coastal—Unit 11, Kahoolawe—Coastal—Unit 1, Kahoolawe—Coastal—Unit 2, Kahoolawe—Coastal—Unit 3, Maui—Lowland Dry—Unit 1, Maui—Lowland Dry—Unit 2, Maui—Lowland Dry—Unit 3, Maui—Lowland Dry—Unit 4, Maui—Lowland Dry—Unit 5, Maui—Lowland Dry—Unit 6, Kahoolawe—Lowland Dry—Unit 1, and Kahoolawe—Lowland Dry—Unit 2, identified in the legal descriptions in paragraphs (e)(1) and (e)(2) of this section, constitute critical habitat for *Sesbania tomentosa* on Maui and Kahoolawe.

(i) In units Maui—Coastal—Unit 9, Maui—Coastal—Unit 10, Maui—Coastal—Unit 11, Kahoolawe—Coastal—Unit 1, Kahoolawe—Coastal—Unit 2, and Kahoolawe—Coastal—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: Less than 980 ft (300 m).

(B) Annual precipitation: Less than 20 in (50 cm).

(C) Substrate: Well-drained, calcareous, talus slopes; weathered clay soils, ephemeral pools; mudflats.

(D) Canopy: *Hibiscus, Myoporum, Santalum, Scaevola.*

(E) Subcanopy: *Gossypium, Sida, Vitex.*

(F) Understory: *Eragrostis, Jacquemontia, Lyceum, Nama, Sesuvium, Sporobolus, Vigna.*

(ii) In units Maui—Lowland Dry—Unit 1, Maui—Lowland Dry—Unit 2, Maui—Lowland Dry—Unit 3, Maui—Lowland Dry—Unit 4, Maui—Lowland Dry—Unit 5, Maui—Lowland Dry—Unit 6, Kahoolawe—Lowland Dry—Unit 1, and Kahoolawe—Lowland Dry—Unit 2, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Less than 50 in (130 cm).

(C) Substrate: Weathered silty loams to stony clay, rocky ledges, little-weathered lava.

(D) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus.*

(E) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia.*

(F) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Sicyos.*

Vigna o-wahuensis (NCN)

Maui—Coastal—Unit 1, Maui—Coastal—Unit 2, Maui—Coastal—Unit 3, Maui—Coastal—Unit 4, Maui—Coastal—Unit 5, Maui—Coastal—Unit 6, Maui—Coastal—Unit 7, Maui—Coastal—Unit 8, Kahoolawe—Coastal—Unit 1, Kahoolawe—Coastal—Unit 2, Kahoolawe—Coastal—Unit 3, Kahoolawe—Lowland Dry—Unit 1, and Kahoolawe—Lowland Dry—Unit 2, identified in the legal descriptions in paragraphs (e)(1) and (e)(2) of this section, constitute critical habitat for *Sesbania tomentosa* on Maui and Kahoolawe.

(i) In units Maui—Coastal—Unit 1, Maui—Coastal—Unit 2, Maui—Coastal—Unit 3, Maui—Coastal—Unit 4, Maui—Coastal—Unit 5, Maui—Coastal—Unit 6, Maui—Coastal—Unit 7, Maui—Coastal—Unit 8, Kahoolawe—Coastal—Unit 1, Kahoolawe—Coastal—Unit 2, and Kahoolawe—Coastal—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: Less than 980 ft (300 m).

(B) Annual precipitation: Less than 20 in (50 cm).

(C) Substrate: Well-drained, calcareous, talus slopes; weathered clay soils; ephemeral pools; mudflats.

(D) Canopy: *Hibiscus, Myoporum, Santalum, Scaevola.*

(E) Subcanopy: *Gossypium, Sida, Vitex.*

(F) Understory: *Eragrostis, Jacquemontia, Lyceum, Nama, Sesuvium, Sporobolus, Vigna.*

(ii) In units Kahoolawe—Lowland Dry—Unit 1 and Kahoolawe—Lowland Dry—Unit 2, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Less than 50 in (130 cm).

(C) Substrate: Weathered silty loams to stony clay, rocky ledges, little-weathered lava.

(D) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus.*

(E) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia.*

(F) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Sicyos.*

Family Gentianaceae

Schenkia sebaeoides (AWIWI)

Maui—Coastal—Unit 9, Maui—Coastal—Unit 10, and Maui—Coastal—Unit 11, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Schenkia sebaeoides* on Maui. In units Maui—Coastal—Unit 9, Maui—Coastal—Unit 10, and Maui—Coastal—Unit 11, the physical and biological features of critical habitat are:

(i) Elevation: Less than 980 ft (300 m).

(ii) Annual precipitation: Less than 20 in (50 cm).

(iii) Substrate: Well-drained, calcareous, talus slopes, weathered clay soils, ephemeral pools, mudflats.

(iv) Canopy: *Hibiscus, Myoporum, Santalum, Scaevola.*

(v) Subcanopy: *Gossypium, Sida, Vitex.*

(vi) Understory: *Eragrostis, Jacquemontia, Lyceum, Nama, Sesuvium, Sporobolus, Vigna.*

Family Geraniaceae

Geranium arboreum (HAWAIIAN RED-FLOWERED GERANIUM)

Maui—Montane Mesic—Unit 1, Maui—Montane Dry—Unit 1, Maui—Subalpine—Unit 1, and Maui—Subalpine—Unit 2, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Geranium arboreum* on Maui.

(i) In unit Maui—Montane Mesic—Unit 1; the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: 15 to 40 in (38 to 100 cm).

(C) Substrate: Deep ash deposits, thin silty loams.

(D) Canopy: *Acacia, Ilex, Metrosideros, Myrsine, Nestegis, Nothocestrum, Pisonia, Pittosporum, Psychotria, Sophora, Zanthoxylum.*

(E) Subcanopy: *Alyxia, Charpentiera, Coprosma, Dodonaea, Kadua, Labordia, Leptecophylla, Phyllostegia, Vaccinium.*

(F) Understory: Ferns, *Carex, Peperomia.*

(ii) In unit Maui—Montane Dry—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: Less than 50 in (130 cm).

(C) Substrate: Dry cinder or ash soils, loamy volcanic sands, blocky lava, rock outcroppings.

(D) Canopy: *Acacia, Metrosideros, Myoporum, Santalum, Sophora.*

(E) Subcanopy: *Chamaesyce, Coprosma, Dodonaea, Dubautia, Leptecophylla, Osteomeles, Wikstroemia.*

(F) Understory: *Bidens, Eragrostis, Melanthera, Vaccinium.*

(iii) In units Maui—Subalpine—Unit 1 and Maui—Subalpine—Unit 2, the physical and biological features of critical habitat are:

(A) Elevation: 6,500 to 9,800 ft (2,000 to 3,000 m).

(B) Annual precipitation: 15 to 40 in (38 to 100 cm).

(C) Substrate: Dry ash; sandy loam; rocky, undeveloped soils; weathered lava.

(D) Canopy: *Chamaesyce, Chenopodium, Metrosideros, Myoporum, Santalum, Sophora.*

(E) Subcanopy: *Coprosma, Dodonaea, Dubautia, Geranium, Leptecophylla, Vaccinium, Wikstroemia.*

(F) Understory: Ferns, *Bidens, Carex, Deschampsia, Eragrostis, Gahnia, Luzula, Panicum, Pseudognaphalium, Sicyos, Tetramolopium.*

Geranium hanaense (NOHOANU)

Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2, Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, and Maui—Montane Wet—Unit 5, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Geranium hanaense* on Maui. In units Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2, Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, and Maui—Montane Wet—Unit 5, the physical and biological features of critical habitat are:

(i) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(ii) Annual precipitation: Greater than 75 in (190 cm).

(iii) Substrate: Well-developed soils, montane bogs.

(iv) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(v) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(vi) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

Geranium hillebrandii (NOHOANU)

Maui—Montane Wet—Unit 6, Maui—Montane Wet—Unit 7, Maui—Montane Wet—Unit 8, Maui—Montane Mesic—Unit 2, Maui—Montane Mesic—Unit 3, Maui—Montane Mesic—Unit 4, Maui—Montane Mesic—Unit 5, and Maui—Montane Mesic—Unit 6, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Geranium hillebrandii* on Maui.

(i) In units Maui—Montane Wet—Unit 6, Maui—Montane Wet—Unit 7, and Maui—Montane Wet—Unit 8, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Well-developed soils, montane bogs.

(D) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(E) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(F) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

(ii) In units Maui—Montane Mesic—Unit 2, Maui—Montane Mesic—Unit 3, Maui—Montane Mesic—Unit 4, Maui—Montane Mesic—Unit 5, and Maui—Montane Mesic—Unit 6, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Deep ash deposits, thin silty loams.

(D) Canopy: *Acacia, Ilex, Metrosideros, Myrsine, Nestegis, Nothocestrum, Pisonia, Pittosporum, Psychotria, Sophora, Zanthoxylum.*

(E) Subcanopy: *Alyxia, Charpentiera, Coprosma, Dodonaea, Kadua, Labordia, Leptecophylla, Phyllostegia, Vaccinium.*

(F) Understory: Ferns, *Carex, Peperomia.*

Geranium multiflorum (NOHOANU)

Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2, Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, Maui—Montane Wet—Unit 5, Maui—Montane Mesic—Unit 1, Maui—Subalpine—Unit 1, and Maui—Subalpine—Unit 2, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Geranium multiflorum* on Maui.

(i) In units Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2, Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, and Maui—Montane Wet—Unit 5, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Well-developed soils, montane bogs.

(D) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(E) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(F) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

(ii) In unit Maui—Montane Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Deep ash deposits, thin silty loams.

(D) Canopy: *Acacia, Ilex, Metrosideros, Myrsine, Nestegis, Nothocestrum, Pisonia, Pittosporum, Psychotria, Sophora, Zanthoxylum.*

(E) Subcanopy: *Alyxia, Charpentiera, Coprosma, Dodonaea, Kadua, Labordia, Leptecophylla, Phyllostegia, Vaccinium.*

(F) Understory: Ferns, *Carex, Peperomia.*

(iii) In units Maui—Subalpine—Unit 1 and Maui—Subalpine—Unit 2, the physical and biological features of critical habitat are:

(A) Elevation: 6,500 to 9,800 ft (2,000 to 3,000 m).

(B) Annual precipitation: 15 to 40 in (38 to 100 cm).

(C) Substrate: Dry ash; sandy loam; rocky, undeveloped soils; weathered lava.

(D) Canopy: *Chamaesyce, Chenopodium, Metrosideros, Myoporum, Santalum, Sophora.*

(E) Subcanopy: *Coprosma, Dodonaea, Dubautia, Geranium, Leptecophylla, Vaccinium, Wikstroemia.*

(F) Understory: Ferns, *Bidens, Carex, Deschampsia, Eragrostis, Gahnia, Luzula, Panicum, Pseudognaphalium, Sicyos, Tetramolopium.*

Family Gesneriaceae

Cyrtandra ferripilosa (HAIWALE)

Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2, Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, Maui—Montane Wet—Unit 5, and Maui—Montane Mesic—Unit 1, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Cyrtandra ferripilosa* on Maui.

(i) In units Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2, Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, Maui—Montane Wet—Unit 5; the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Well-developed soils, montane bogs.

(D) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(E) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(F) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

(ii) In unit Maui—Montane Mesic—Unit 1; the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Deep ash deposits, thin silty loams.

(D) Canopy: *Acacia, Ilex, Metrosideros, Myrsine, Nestegis, Nothocestrum, Pisonia, Pittosporum, Psychotria, Sophora, Zanthoxylum.*

(E) Subcanopy: *Alyxia, Charpentiera, Coprosma, Dodonaea, Kadua, Labordia, Leptecophylla Vaccinium.*

(F) Understory: *Carex,* ferns, *Peperomia.*

Cyrtandra filipes (HAIWALE)

Maui—Lowland Wet—Unit 2, Maui—Lowland Wet—Unit 3, Maui—Lowland Wet—Unit 4, Maui—Lowland Wet—Unit 5, Maui—Lowland Wet—Unit 6, Maui—Lowland Wet—Unit 7, Maui—Lowland Wet—Unit 8, Maui—Wet Cliff—Unit 5, Maui—Wet Cliff—Unit 6, Maui—Wet Cliff—Unit 7, and Maui—Wet Cliff—Unit 8, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Cyrtandra filipes* on Maui.

(i) In units Maui—Lowland Wet—Unit 2, Maui—Lowland Wet—Unit 3, Maui—Lowland Wet—Unit 4, Maui—Lowland Wet—Unit 5, Maui—Lowland Wet—Unit 6, Maui—Lowland Wet—Unit 7, and Maui—Lowland Wet—Unit 8, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

(ii) In units Maui—Wet Cliff—Unit 5, Maui—Wet Cliff—Unit 6, Maui—Wet Cliff—Unit 7, and Maui—Wet Cliff—Unit 8, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.

(D) Canopy: None.

(E) Subcanopy: *Broussaisia, Cheirodendron, Leptocophylla, Metrosideros.*

(F) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Cyrtandra munroi (HAIWALE)

Maui—Lowland Wet—Unit 2, Maui—Lowland Wet—Unit 3, Maui—Lowland Wet—Unit 4, Maui—Lowland Wet—Unit 5, Maui—Lowland Wet—Unit 6, Maui—Lowland Wet—Unit 7, Maui—Lowland Wet—Unit 8, Maui—Wet Cliff—Unit 5, Maui—Wet Cliff—Unit 6, Maui—Wet Cliff—Unit 7, and Maui—Wet Cliff—Unit 8, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Cyrtandra munroi* on Maui.

(i) In units Maui—Lowland Wet—Unit 2, Maui—Lowland Wet—Unit 3, Maui—Lowland Wet—Unit 4, Maui—Lowland Wet—Unit 5, Maui—Lowland Wet—Unit 6, Maui—Lowland Wet—Unit 7, and Maui—Lowland Wet—Unit 8, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

(ii) In units Maui—Wet Cliff—Unit 5, Maui—Wet Cliff—Unit 6, Maui—Wet Cliff—Unit 7, and Maui—Wet Cliff—Unit 8, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.

(D) Canopy: None.

(E) Subcanopy: *Broussaisia, Cheirodendron, Leptocophylla, Metrosideros.*

(F) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Cyrtandra oxybapha (HAIWALE)

Maui—Montane Wet—Unit 6, Maui—Montane Wet—Unit 7, Maui—Montane Wet—Unit 8, and Maui—Montane Mesic—Unit 1, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Cyrtandra oxybapha* on Maui.

(i) In units Maui—Montane Wet—Unit 6, Maui—Montane Wet—Unit 7, and Maui—Montane Wet—Unit 8, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Well-developed soils, montane bogs.

(D) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(E) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(F) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

(ii) In unit Maui—Montane Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Deep ash deposits, thin silty loams.

(D) Canopy: *Acacia, Ilex, Metrosideros, Myrsine, Nestegis, Nothocestrum, Pisonia, Pittosporum, Psychotria, Sophora, Zanthoxylum.*

(E) Subcanopy: *Alyxia, Charpentiera, Coprosma, Dodonaea, Kadua, Labordia, Leptecophylla, Phyllostegia, Vaccinium.*

(F) Understory: Ferns, *Carex, Peperomia.*

Family Lamiaceae

Phyllostegia bracteata (NCN)

Maui—Lowland Wet—Unit 2, Maui—Lowland Wet—Unit 3, Maui—Lowland Wet—Unit 4, Maui—Lowland Wet—Unit 5, Maui—Lowland Wet—Unit 6, Maui—Lowland Wet—Unit 7, Maui—Lowland Wet—Unit 8, Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2, Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, Maui—Montane Wet—Unit 5, Maui—Montane Wet—Unit 6, Maui—Montane Wet—Unit 7, Maui—Montane Wet—Unit 8, Maui—Montane Mesic—Unit 1, Maui—Subalpine—Unit 1, Maui—Subalpine—Unit 2, Maui—Wet Cliff—Unit 1, Maui—Wet Cliff—Unit 2, Maui—Wet Cliff—Unit 3, and Maui—Wet Cliff—

Unit 4, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Phyllostegia bracteata* on Maui.

(i) In units Maui—Lowland Wet—Unit 2, Maui—Lowland Wet—Unit 3, Maui—Lowland Wet—Unit 4, Maui—Lowland Wet—Unit 5, Maui—Lowland Wet—Unit 6, Maui—Lowland Wet—Unit 7, and Maui—Lowland Wet—Unit 8, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

(ii) In units Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2, Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, Maui—Montane Wet—Unit 5, Maui—Montane Wet—Unit 6, Maui—Montane Wet—Unit 7, and Maui—Montane Wet—Unit 8, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Well-developed soils, montane bogs.

(D) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(E) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(F) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

(iii) In unit Maui—Montane Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Deep ash deposits, thin silty loams.

(D) Canopy: *Acacia, Ilex, Metrosideros, Myrsine, Nestegis, Nothocestrum, Pisonia, Pittosporum, Psychotria, Sophora, Zanthoxylum.*

(E) Subcanopy: *Alyxia, Charpentiera, Coprosma, Dodonaea, Kadua, Labordia, Leptecophylla, Phyllostegia, Vaccinium.*

(F) Understory: Ferns, *Carex, Peperomia.*

(iv) In units Maui—Subalpine—Unit 1 and Maui—Subalpine—Unit 2, the physical and biological features of critical habitat are:

(A) Elevation: 6,500 to 9,800 ft (2,000 to 3,000 m).

(B) Annual precipitation: 15 to 40 in (38 to 100 cm).

(C) Substrate: Dry ash; sandy loam; rocky, undeveloped soils; weathered lava.

(D) Canopy: *Chamaesyce, Chenopodium, Metrosideros, Myoporum, Santalum, Sophora.*

(E) Subcanopy: *Coprosma, Dodonaea, Dubautia, Geranium, Leptecophylla, Vaccinium, Wikstroemia.*

(F) Understory: *Bidens, Carex, Deschampsia, Eragrostis, ferns, Gahnia, Luzula, Panicum, Pseudognaphalium, Sicyos, Tetramolopium.*

(v) In units Maui—Wet Cliff—Unit 1, Maui—Wet Cliff—Unit 2, Maui—Wet Cliff—Unit 3, and Maui—Wet Cliff—Unit 4, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.

(D) Canopy: None.

(E) Subcanopy: *Broussaisia, Cheirodendron, Leptocophylla, Metrosideros.*

(F) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Phyllostegia haliakalae (NCN)

Maui—Wet Cliff—Unit 1, Maui—Wet Cliff—Unit 2, Maui—Wet Cliff—Unit 3, and Maui—Wet Cliff—Unit 4, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Phyllostegia haliakalae* on Maui. In units Maui—Wet Cliff—Unit 1, Maui—Wet Cliff—Unit 2, Maui—Wet Cliff—Unit 3, and Maui—Wet Cliff—Unit 4, the physical and biological features of critical habitat are:

(i) Elevation: Unrestricted.

(ii) Annual precipitation: Greater than 75 in (190 cm).

(iii) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.

(iv) Canopy: None.

(v) Subcanopy: *Broussaisia, Cheirodendron, Leptocophylla, Metrosideros.*

(vi) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Phyllostegia mannii (NCN)

Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2, Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, Maui—Montane Wet—Unit 5, and Maui—Montane Mesic—Unit 1, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Phyllostegia mannii* on Maui.

(i) In units Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2, Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, and Maui—Montane Wet—Unit 5, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Well-developed soils, montane bogs.

(D) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(E) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(F) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

(ii) In unit Maui—Montane Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Deep ash deposits, thin silty loams.

(D) Canopy: *Acacia, Ilex, Metrosideros, Myrsine, Nestegis, Nothocestrum, Pisonia, Pittosporum, Psychotria, Sophora, Zanthoxylum.*

(E) Subcanopy: *Alyxia, Charpentiera, Coprosma, Dodonaea, Kadua, Labordia, Leptecophylla, Phyllostegia, Vaccinium.*

(F) Understory: Ferns, *Carex, Peperomia.*

Phyllostegia pilosa (NCN)

Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2, Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, and Maui—Montane Wet—Unit 5, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Phyllostegia pilosa* on Maui. In units Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2, Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, and Maui—Montane Wet—Unit 5, the physical and biological features of critical habitat are:

(i) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(ii) Annual precipitation: Greater than 75 in (190 cm).

(iii) Substrate: Well-developed soils, montane bogs.

(iv) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(v) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(vi) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

Stenogyne kauaulaensis (NCN)

Maui—Montane Mesic—Unit 2, Maui—Montane Mesic—Unit 3, Maui—

Montane Mesic—Unit 4, Maui—Montane Mesic—Unit 5, and Maui—Montane Mesic—Unit 6, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Stenogyne kauaulaensis* on Maui. In unit Maui—Montane Mesic—Unit 2, Maui—Montane Mesic—Unit 3, Maui—Montane Mesic—Unit 4, Maui—Montane Mesic—Unit 5, and Maui—Montane Mesic—Unit 6, the physical and biological features of critical habitat are:

(i) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(ii) Annual precipitation: 50 to 75 in (130 to 190 cm).

(iii) Substrate: Deep ash deposits, thin silty loams.

(iv) Canopy: *Acacia, Ilex, Metrosideros, Myrsine, Nestegis, Nothocestrum, Pisonia, Pittosporum, Psychotria, Sophora, Zanthoxylum.*

(v) Subcanopy: *Alyxia, Charpentiera, Coprosma, Dodonaea, Kadua, Labordia, Leptecophylla, Phyllostegia, Vaccinium.*

(vi) Understory: Ferns, *Carex, Peperomia.*

Family Malvaceae

Hibiscus brackenridgei (MAO HAU HELE)

Maui—Lowland Dry—Unit 1, Maui—Lowland Dry—Unit 2, Maui—Lowland Dry—Unit 3, Maui—Lowland Dry—Unit 4, Maui—Lowland Dry—Unit 5, Maui—Lowland Dry—Unit 6, Kahoolawe—Lowland Dry—Unit 1, Kahoolawe—Lowland Dry—Unit 1, and Kahoolawe—Lowland Dry—Unit 2, identified in the legal descriptions in paragraphs (e)(1) and (e)(2) of this section, constitute critical habitat for *Hibiscus brackenridgei* on Maui and Kahoolawe. In units Maui—Lowland Dry—Unit 1, Maui—Lowland Dry—Unit 2, Maui—Lowland Dry—Unit 3, Maui—Lowland Dry—Unit 4, Maui—Lowland Dry—Unit 5, Maui—Lowland Dry—Unit 6, Kahoolawe—Lowland Dry—Unit 1, and Kahoolawe—Lowland Dry—Unit 2, the physical and biological features of critical habitat are:

(i) Elevation: Less than 3,300 ft (1,000 m).

(ii) Annual precipitation: Less than 50 in (130 cm).

(iii) Substrate: Weathered silty loams to stony clay, rocky ledges, little-weathered lava.

(iv) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus.*

(v) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia.*

(vi) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Sicyos.*

Family Myrsinaceae

Myrsine vaccinioides (KOLEA)

Maui—Montane Wet—Unit 6, Maui—Montane Wet—Unit 7, and Maui—Montane Wet—Unit 8, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Myrsine vaccinioides* on Maui. In units Maui—Montane Wet—Unit 6, Maui—Montane Wet—Unit 7, and Maui—Montane Wet—Unit 8, the physical and biological features of critical habitat are:

(i) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(ii) Annual precipitation: Greater than 75 in (190 cm).

(iii) Substrate: Well-developed soils, montane bogs.

(iv) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(v) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(vi) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

Family Orchidaceae

Platanthera holochila (NCN)

Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2, Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, Maui—Montane Wet—Unit 5, Maui—Montane Wet—Unit 6, Maui—Montane Wet—Unit 7, Maui—Montane Wet—Unit 8, Maui—Wet Cliff—Unit 5, Maui—Wet Cliff—Unit 6, Maui—Wet Cliff—Unit 7, and Maui—Wet Cliff—Unit 8; identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Platanthera holochila* on Maui.

(i) In units Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2, Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, Maui—Montane Wet—Unit 5, Maui—Montane Wet—Unit 6, Maui—Montane Wet—Unit 7, and Maui—Montane Wet—Unit 8, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Well-developed soils, montane bogs.

(D) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(E) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(F) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

(ii) In units Maui—Wet Cliff—Unit 5, Maui—Wet Cliff—Unit 6, Maui—Wet Cliff—Unit 7, and Maui—Wet Cliff—Unit 8, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.

(D) Canopy: None.

(E) Subcanopy: *Broussaisia, Cheirodendron, Leptocophylla, Metrosideros.*

(F) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Family Piperaceae

Peperomia subpetiolata (ALAALA WAI NUI)

Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2, Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, and Maui—Montane Wet—Unit 5, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Peperomia subpetiolata* on Maui. In units Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2, Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, and Maui—Montane Wet—Unit 5, the physical and biological features of critical habitat are:

(i) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(ii) Annual precipitation: Greater than 75 in (190 cm).

(iii) Substrate: Well-developed soils, montane bogs.

(iv) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(v) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(vi) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

Family Plantaginaceae

Plantago princeps (LAUKAHI KUAHIWI)

Maui—Dry Cliff—Unit 1, Maui—Dry Cliff—Unit 2, Maui—Dry Cliff—Unit 3, Maui—Dry Cliff—Unit 4, Maui—Wet Cliff—Unit 1, Maui—Wet Cliff—Unit 2, Maui—Wet Cliff—Unit 3, Maui—Wet Cliff—Unit 4, Maui—Wet Cliff—Unit 5, Maui—Wet Cliff—Unit 6, Maui—Wet Cliff—Unit 7, and Maui—Wet Cliff—Unit 8, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Plantago princeps* on Maui.

(i) In units Maui—Dry Cliff—Unit 1, Maui—Dry Cliff—Unit 2, Maui—Dry Cliff—Unit 3, and Maui—Dry Cliff—Unit 4, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Less than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, rocky talus.

(D) Canopy: None.

(E) Subcanopy: *Antidesma, Chamaesyce, Diospyros, Dodonaea.*

(F) Understory: *Bidens, Eragrostis, Melanthera, Schiedea.*

(ii) In units Maui—Wet Cliff—Unit 1, Maui—Wet Cliff—Unit 2, Maui—Wet Cliff—Unit 3, Maui—Wet Cliff—Unit 4, Maui—Wet Cliff—Unit 5, Maui—Wet Cliff—Unit 6, Maui—Wet Cliff—Unit 7, and Maui—Wet Cliff—Unit 8, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.

(D) Canopy: None.

(E) Subcanopy: *Broussaisia, Cheirodendron, Leptocophylla, Metrosideros.*

(F) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Family Poaceae

Calamagrostis hillebrandii (NCN)

Maui—Montane Wet—Unit 6, Maui—Montane Wet—Unit 7, and Maui—Montane Wet—Unit 8, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Calamagrostis hillebrandii* on Maui. In units Maui—Montane Wet—Unit 6, Maui—Montane Wet—Unit 7, and Maui—Montane Wet—Unit 8, the physical and biological features of critical habitat are:

(i) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(ii) Annual precipitation: Greater than 75 in (190 cm).

(iii) Substrate: Well-developed soils, montane bogs.

(iv) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(v) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(vi) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

Cenchrus agrimonioides (KAMANOMANO (= SANDBUR, AGRIMONY))

Maui—Lowland Dry—Unit 1, Maui—Lowland Dry—Unit 2, Maui—Lowland Dry—Unit 3, Maui—Lowland Dry—Unit 4, Maui—Lowland Dry—Unit 5, and Maui—Lowland Dry—Unit 6, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Cenchrus agrimonioides* on Maui. In units Maui—Lowland Dry—Unit 1, Maui—Lowland Dry—Unit 2, Maui—Lowland Dry—Unit 3, Maui—Lowland Dry—Unit 4, Maui—Lowland Dry—Unit 5, and Maui—Lowland Dry—Unit 6, the physical and biological features of critical habitat are:

(i) Elevation: Less than 3,300 ft (1,000 m).

(ii) Annual precipitation: Less than 50 in (130 cm).

(iii) Substrate: Weathered silty loams to stony clay, rocky ledges, little-weathered lava.

(iv) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus.*

(v) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia.*

(vi) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Sicyos.*

Ischaemum byrone (HILO ISCHAEMUM)

Maui—Coastal—Unit 1, Maui—Coastal—Unit 2, Maui—Coastal—Unit 3, Maui—Coastal—Unit 4, Maui—Coastal—Unit 5, Maui—Coastal—Unit 6, Maui—Coastal—Unit 7, and Maui—Coastal—Unit 8, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Ischaemum byrone* on Maui. In units Maui—Coastal—Unit 1, Maui—Coastal—Unit 2, Maui—Coastal—Unit 3, Maui—Coastal—Unit 4, Maui—Coastal—Unit 5, Maui—Coastal—Unit 6, Maui—Coastal—Unit 7, and Maui—Coastal—Unit 8, the physical and biological features of critical habitat are:

(i) Elevation: Less than 980 ft (300 m).

(ii) Annual precipitation: Less than 20 in (50 cm).

(iii) Substrate: Well-drained, calcareous, talus slopes; weathered clay soils, ephemeral pools; mudflats.

(iv) Canopy: *Hibiscus, Myoporum, Santalum, Scaevola.*

(v) Subcanopy: *Gossypium, Sida, Vitex.*

(vi) Understory: *Eragrostis, Jacquemontia, Lyceum, Nama, Sesuvium, Sporobolus, Vigna.*

Family Primulaceae

Lysimachia lydgatei (NCN)

Maui—Lowland Dry—Unit 5, Maui—Lowland Dry—Unit 6, Maui—Montane Mesic—Unit 2, Maui—Montane Mesic—Unit 3, Maui—Montane Mesic—Unit 4, Maui—Montane Mesic—Unit 5, Maui—Montane Mesic—Unit 6, Maui—Wet Cliff—Unit 5, Maui—Wet Cliff—Unit 6, Maui—Wet Cliff—Unit 7, and Maui—Wet Cliff—Unit 8, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Lysimachia lydgatei* on Maui.

(i) In units Maui—Lowland Dry—Unit 5 and Maui—Lowland Dry—Unit 6, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Less than 50 in (130 cm).

(C) Substrate: Weathered silty loams to stony clay, rocky ledges, little-weathered lava.

(D) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus.*

(E) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia.*

(F) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Sicyos.*

(ii) In units Maui—Montane Mesic—Unit 2, Maui—Montane Mesic—Unit 3, Maui—Montane Mesic—Unit 4, Maui—Montane Mesic—Unit 5, and Maui—Montane Mesic—Unit 6, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Deep ash deposits, thin silty loams.

(D) Canopy: *Acacia, Ilex, Metrosideros, Myrsine, Nestegis, Nothocestrum, Pisonia, Pittosporum, Psychotria, Sophora, Zanthoxylum.*

(E) Subcanopy: *Alyxia, Charpentiera, Coprosma, Dodonaea, Kadua, Labordia, Leptecophylla, Phyllostegia, Vaccinium.*

(F) Understory: Ferns, *Carex, Peperomia.*

(iii) In units Maui—Wet Cliff—Unit 5, Maui—Wet Cliff—Unit 6, Maui—Wet Cliff—Unit 7, and Maui—Wet Cliff—Unit 8, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.

(D) Canopy: None.

(E) Subcanopy: *Broussaisia, Cheirodendron, Leptocophylla, Metrosideros.*

(F) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Family Rhamnaceae

Colubrina oppositifolia (KAUILA)

Maui—Lowland Dry—Unit 1, Maui—Lowland Dry—Unit 2, Maui—Lowland Dry—Unit 3, Maui—Lowland Dry—Unit 4, Maui—Lowland Mesic—Unit 2, and Maui—Lowland Mesic—Unit 3, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Colubrina oppositifolia* on Maui.

(i) In units Maui—Lowland Dry—Unit 1, Maui—Lowland Dry—Unit 2, Maui—Lowland Dry—Unit 3, and Maui—Lowland Dry—Unit 4, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Less than 50 in (130 cm).

(C) Substrate: Weathered silty loams to stony clay, rocky ledges, little-weathered lava.

(D) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus*.

(E) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia*.

(F) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Sicyos*.

(ii) In units Maui—Lowland Mesic—Unit 2 and Maui—Lowland Mesic—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Shallow soils, little to no herbaceous layer.

(D) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum*.

(E) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax*.

(F) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia*.

Gouania hillebrandii (NCN)

Maui—Lowland Dry—Unit 5, Maui—Lowland Dry—Unit 6, Kahoolawe—Lowland Dry—Unit 1, and Kahoolawe—Lowland Dry—Unit 2, identified in the legal descriptions in paragraphs (e)(1) and (e)(2) of this section, constitute critical habitat for *Gouania hillebrandii* on Maui and Kahoolawe. In units Maui—Lowland Dry—Unit 5, Maui—Lowland Dry—Unit 6, Kahoolawe—Lowland Dry—Unit 1, and Kahoolawe—Lowland Dry—Unit 2, the physical and biological features of critical habitat are:

(i) Elevation: Less than 3,300 ft (1,000 m).

(ii) Annual precipitation: Less than 50 in (130 cm).

(iii) Substrate: Weathered silty loams to stony clay, rocky ledges, little-weathered lava.

(iv) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus*.

(v) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia*.

(vi) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Sicyos*.

Gouania vitifolia (NCN)

Maui—Wet Cliff—Unit 5, Maui—Wet Cliff—Unit 6, Maui—Wet Cliff—Unit 7, and Maui—Wet Cliff—Unit 8, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Gouania vitifolia* on Maui. In units Maui—Wet Cliff—Unit 5, Maui—Wet Cliff—Unit 6, Maui—Wet Cliff—Unit 7, and Maui—Wet Cliff—Unit 8, the physical and biological features of critical habitat are:

(i) Elevation: Unrestricted.

(ii) Annual precipitation: Greater than 75 in (190 cm).

(iii) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.

(iv) Canopy: None.

(v) Subcanopy: *Broussaisia, Cheirodendron, Leptocophylla, Metrosideros*.

(vi) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia*.

Family Rosaceae

Acaena exigua (LILIWAI)

Maui—Montane Wet—Unit 6, Maui—Montane Wet—Unit 7, and Maui—Montane Wet—Unit 8, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Acaena exigua* on Maui. In units Maui—Montane Wet—Unit 6, Maui—Montane Wet—Unit 7, and Maui—Montane Wet—Unit 8; the physical and biological features of critical habitat are:

(i) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(ii) Annual precipitation: Greater than 75 in (190 cm).

(iii) Substrate: Well-developed soils, montane bogs.

(iv) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros*.

(v) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine*.

(vi) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium*.

Family Rubiaceae

Kadua coriacea (KIOELE)

Maui—Lowland Dry—Unit 5 and Maui—Lowland Dry—Unit 6, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Kadua coriacea* on Maui. In units Maui—Lowland Dry—Unit 5 and Maui—Lowland Dry—Unit 6, the physical and biological features of critical habitat are:

(i) Elevation: Less than 3,300 ft (1,000 m).

(ii) Annual precipitation: Less than 50 in (130 cm).

(iii) Substrate: Weathered silty loams to stony clay, rocky ledges, little-weathered lava.

(iv) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus*.

(v) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia*.

(vi) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Sicyos*.

Kadua laxiflora (PILO)

Maui—Lowland Wet—Unit 2, Maui—Lowland Wet—Unit 3, Maui—Lowland Wet—Unit 4, Maui—Lowland Wet—Unit 5, Maui—Lowland Wet—Unit 6, Maui—Lowland Wet—Unit 7, Maui—Lowland Wet—Unit 8, Maui—Dry Cliff—Unit 5, Maui—Dry Cliff—Unit 6, Maui—Dry Cliff—Unit 7, Maui—Wet Cliff—Unit 5, Maui—Wet Cliff—Unit 6, Maui—Wet Cliff—Unit 7, and Maui—Wet Cliff—Unit 8, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Kadua laxiflora* on Maui.

(i) In units Maui—Lowland Wet—Unit 2, Maui—Lowland Wet—Unit 3, Maui—Lowland Wet—Unit 4, Maui—Lowland Wet—Unit 5, Maui—Lowland Wet—Unit 6, Maui—Lowland Wet—Unit 7, and Maui—Lowland Wet—Unit 8, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria*.

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope*.

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia*.

(ii) In units Maui—Dry Cliff—Unit 5, Maui—Dry Cliff—Unit 6, and Maui—Dry Cliff—Unit 7, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Less than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, rocky talus.

(D) Canopy: None.

(E) Subcanopy: *Antidesma, Chamaesyce, Diospyros, Dodonaea*.

(F) Understory: *Bidens, Eragrostis, Melanthera, Schiedea*.

(iii) In units Maui—Wet Cliff—Unit 5, Maui—Wet Cliff—Unit 6, Maui—Wet Cliff—Unit 7, and Maui—Wet Cliff—Unit 8, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.

(D) Canopy: None.

(E) Subcanopy: *Broussaisia, Cheirodendron, Leptocophylla, Metrosideros*.

(F) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia*.

Family Rutaceae

Melicope adscendens (ALANI)

Maui—Lowland Dry—Unit 1, Maui—Lowland Dry—Unit 2, Maui—Lowland Dry—Unit 3, Maui—Lowland Dry—Unit 4, and Maui—Montane Mesic—Unit 1, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Melicope adscendens* on Maui.

(i) In units Maui—Lowland Dry—Unit 1, Maui—Lowland Dry—Unit 2, Maui—Lowland Dry—Unit 3, and Maui—Lowland Dry—Unit 4, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Less than 50 in (130 cm).

(C) Substrate: Weathered silty loams to stony clay, rocky ledges, little-weathered lava.

(D) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus*.

(E) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia*.

(F) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Sicyos*.

(ii) In unit Maui—Montane Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Deep ash deposits, thin silty loams.

(D) Canopy: *Acacia, Ilex, Metrosideros, Myrsine, Nestegis, Nothocestrum, Pisonia, Pittosporum, Psychotria, Sophora, Zanthoxylum*.

(E) Subcanopy: *Alyxia, Charpentiera, Coprosma, Dodonaea, Kadua, Labordia, Leptecophylla, Phyllostegia, Vaccinium*.

(F) Understory: Ferns, *Carex, Peperomia*.

Melicope balloui (ALANI)

Maui—Lowland Wet—Unit 1, Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2, Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, and Maui—Montane Wet—Unit 5, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Melicope balloui* on Maui.

(i) In unit Maui—Lowland Wet—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria*.

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope*.

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia*.

(ii) In units Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2, Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, and Maui—Montane Wet—Unit 5, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Well-developed soils, montane bogs.

(D) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros*.

(E) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine*.

(F) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium*.

Melicope knudsenii (ALANI)

Maui—Montane Dry—Unit 1, identified in the legal descriptions in paragraph (e)(1) of this section, constitutes critical habitat for *Melicope knudsenii* on Maui. In unit Maui—Montane Dry—Unit 1; the physical and biological features of critical habitat are:

(i) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(ii) Annual precipitation: Less than 50 in (130 cm).

(ii) Substrate: Dry cinder or ash soils, loamy volcanic sands, blocky lava, rock outcroppings.

(iv) Canopy: *Acacia, Metrosideros, Myoporum, Santalum, Sophora*.

(v) Subcanopy: *Chamaesyce, Coprosma, Dodonaea, Dubautia, Leptecophylla, Osteomeles, Wikstroemia*.

(vi) Understory: *Bidens, Eragrostis, Melanthera, Vaccinium*.

Melicope mucronulata (ALANI)

Maui—Lowland Dry—Unit 1, Maui—Lowland Dry—Unit 2, Maui—Lowland Dry—Unit 3, Maui—Lowland Dry—Unit 4, and Maui—Montane Dry—Unit 1, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Melicope mucronulata* on Maui.

(i) In units Maui—Lowland Dry—Unit 1, Maui—Lowland Dry—Unit 2, Maui—Lowland Dry—Unit 3, and Maui—Lowland Dry—Unit 4, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Less than 50 in (130 cm).

(C) Substrate: Weathered silty loams to stony clay, rocky ledges, little-weathered lava.

(D) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus*.

(E) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia*.

(F) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Sicyos*.

(ii) In unit Maui—Montane Dry—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: Less than 50 in (130 cm).

(C) Substrate: Dry cinder or ash soils, loamy volcanic sands, blocky lava, rock outcroppings.

(D) Canopy: *Acacia, Metrosideros, Myoporum, Santalum, Sophora*.

(E) Subcanopy: *Chamaesyce, Coprosma, Dodonaea, Dubautia, Leptecophylla, Osteomeles, Wikstroemia*.

(F) Understory: *Bidens, Eragrostis, Melanthera, Vaccinium*.

Melicope ovalis (ALANI)

Maui—Lowland Wet—Unit 1, Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2, Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, Maui—Montane Wet—Unit 5, Maui—Wet Cliff—Unit 1, Maui—Wet Cliff—Unit 2, Maui—Wet Cliff—Unit 3, and Maui—Wet Cliff—Unit 4, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Melicope ovalis* on Maui.

(i) In unit Maui—Lowland Wet—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria*.

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope*.

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia*.

(ii) In units Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2,

Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, and Maui—Montane Wet—Unit 5, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Well-developed soils, montane bogs.

(D) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(E) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(F) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

(iii) In units Maui—Wet Cliff—Unit 1, Maui—Wet Cliff—Unit 2, Maui—Wet Cliff—Unit 3, and Maui—Wet Cliff—Unit 4, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.

(D) Canopy: None.

(E) Subcanopy: *Broussaisia, Cheirodendron, Leptocophylla, Metrosideros.*

(F) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Zanthoxylum hawaiiense (AE)

Maui—Lowland Dry—Unit 1, Maui—Lowland Dry—Unit 2, Maui—Lowland Dry—Unit 3, Maui—Lowland Dry—Unit 4, Maui—Lowland Mesic—Unit 2, Maui—Lowland Mesic—Unit 3, Maui—Montane Mesic—Unit 1, Maui—Montane Mesic—Unit 2, Maui—Montane Mesic—Unit 3, Maui—Montane Mesic—Unit 4, Maui—Montane Mesic—Unit 5, Maui—Montane Mesic—Unit 6, Maui—Montane Dry—Unit 1, Maui—Subalpine—Unit 1, and Maui—Subalpine—Unit 2, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Zanthoxylum hawaiiense* on Maui.

(i) In units Maui—Lowland Dry—Unit 1, Maui—Lowland Dry—Unit 2, Maui—Lowland Dry—Unit 3, and Maui—Lowland Dry—Unit 4, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Less than 50 in (130 cm).

(C) Substrate: Weathered silty loams to stony clay, rocky ledges, little-weathered lava.

(D) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus.*

(E) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia.*

(F) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Sicyos.*

(ii) In units Maui—Lowland Mesic—Unit 2 and Maui—Lowland Mesic—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Shallow soils, little to no herbaceous layer.

(D) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(E) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(F) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

(iii) In units Maui—Montane Mesic—Unit 1, Maui—Montane Mesic—Unit 2, Maui—Montane Mesic—Unit 3, Maui—Montane Mesic—Unit 4, Maui—Montane Mesic—Unit 5, and Maui—Montane Mesic—Unit 6, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Deep ash deposits, thin silty loams.

(D) Canopy: *Acacia, Ilex, Metrosideros, Myrsine, Nestegis, Nothocestrum, Pisonia, Pittosporum, Psychotria, Sophora, Zanthoxylum.*

(E) Subcanopy: *Alyxia, Charpentiera, Coprosma, Dodonaea, Kadua, Labordia, Leptecophylla, Phyllostegia, Vaccinium.*

(F) Understory: Ferns, *Carex, Peperomia.*

(iv) In unit Maui—Montane Dry—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: Less than 50 in (130 cm).

(C) Substrate: Dry cinder or ash soils, loamy volcanic sands, blocky lava, rock outcroppings.

(D) Canopy: *Acacia, Metrosideros, Myoporum, Santalum, Sophora.*

(E) Subcanopy: *Chamaesyce, Coprosma, Dodonaea, Dubautia, Leptecophylla, Osteomeles, Wikstroemia.*

(F) Understory: *Bidens, Eragrostis, Melanthera, Vaccinium.*

(v) In units Maui—Subalpine—Unit 1 and Maui—Subalpine—Unit 2, the physical and biological features of critical habitat are:

(A) Elevation: 6,500 to 9,800 ft (2,000 to 3,000 m).

(B) Annual precipitation: 15 to 40 in (38 to 100 cm).

(C) Substrate: Dry ash; sandy loam; rocky, undeveloped soils; weathered lava.

(D) Canopy: *Chamaesyce, Chenopodium, Metrosideros, Myoporum, Santalum, Sophora.*

(E) Subcanopy: *Coprosma, Dodonaea, Dubautia, Geranium, Leptecophylla, Vaccinium, Wikstroemia.*

(F) Understory: Ferns, *Bidens, Carex, Deschampsia, Eragrostis, Gahnia, Luzula, Panicum, Pseudognaphalium, Sicyos, Tetramolopium.*

Family Santalaceae

Santalum haleakalae var. *lanaiense* (LANAI SANDALWOOD, ILIAHI)

Maui—Lowland Dry—Unit 1, Maui—Lowland Dry—Unit 2, Maui—Lowland Dry—Unit 3, Maui—Lowland Dry—Unit 4, Maui—Lowland Dry—Unit 5, Maui—Lowland Dry—Unit 6, Maui—Lowland Mesic—Unit 2, Maui—Lowland Mesic—Unit 3, Maui—Lowland Wet—Unit 2, Maui—Lowland Wet—Unit 3, Maui—Lowland Wet—Unit 4, Maui—Lowland Wet—Unit 5, Maui—Lowland Wet—Unit 6, Maui—Lowland Wet—Unit 7, Maui—Lowland Wet—Unit 8, Maui—Montane Mesic—Unit 1, Maui—Montane Mesic—Unit 2, Maui—Montane Mesic—Unit 3, Maui—Montane Mesic—Unit 4, Maui—Montane Mesic—Unit 5, Maui—Montane Mesic—Unit 6, Maui—Montane Dry—Unit 1, Maui—Wet Cliff—Unit 5, Maui—Wet Cliff—Unit 6, Maui—Wet Cliff—Unit 7, and Maui—Wet Cliff—Unit 8, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Santalum haleakalae* var. *lanaiense* on Maui.

(i) In units Maui—Lowland Dry—Unit 1, Maui—Lowland Dry—Unit 2, Maui—Lowland Dry—Unit 3, Maui—Lowland Dry—Unit 4, Maui—Lowland Dry—Unit 5, and Maui—Lowland Dry—Unit 6, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Less than 50 in (130 cm).

(C) Substrate: Weathered silty loams to stony clay, rocky ledges, little-weathered lava.

(D) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus.*

(E) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia.*

(F) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Sicyos.*

(ii) In units Maui—Lowland Mesic—Unit 2 and Maui—Lowland Mesic—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Shallow soils, little to no herbaceous layer.

(D) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(E) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(F) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

(iii) In units Maui—Lowland Wet—Unit 2, Maui—Lowland Wet—Unit 3, Maui—Lowland Wet—Unit 4, Maui—Lowland Wet—Unit 5, Maui—Lowland Wet—Unit 6, Maui—Lowland Wet—Unit 7, and Maui—Lowland Wet—Unit 8, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

(iv) In units Maui—Montane Mesic—Unit 1, Maui—Montane Mesic—Unit 2, Maui—Montane Mesic—Unit 3, Maui—Montane Mesic—Unit 4, Maui—Montane Mesic—Unit 5, and Maui—Montane Mesic—Unit 6, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Deep ash deposits, thin silty loams.

(D) Canopy: *Acacia, Ilex, Metrosideros, Myrsine, Nestegis, Nothocestrum, Pisonia, Pittosporum, Psychotria, Sophora, Zanthoxylum.*

(E) Subcanopy: *Alyxia, Charpentiera, Coprosma, Dodonaea, Kadua, Labordia, Leptecophylla, Phyllostegia, Vaccinium.*

(F) Understory: Ferns, *Carex, Peperomia.*

(v) In unit Maui—Montane Dry—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: Less than 50 in (130 cm).

(C) Substrate: Dry cinder or ash soils, loamy volcanic sands, blocky lava, rock outcroppings.

(D) Canopy: *Acacia, Metrosideros, Myoporum, Santalum, Sophora.*

(E) Subcanopy: *Chamaesyce, Coprosma, Dodonaea, Dubautia, Leptecophylla, Osteomeles, Wikstroemia.*

(F) Understory: *Bidens, Eragrostis, Melanthera, Vaccinium.*

(vi) In units Maui—Wet Cliff—Unit 5, Maui—Wet Cliff—Unit 6, Maui—Wet Cliff—Unit 7, and Maui—Wet Cliff—Unit 8, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.

(D) Canopy: None.

(E) Subcanopy: *Broussaisia, Cheirodendron, Leptocophylla, Metrosideros.*

(F) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Family Sapindaceae

Alectryon macrococcus (MAHOE)

Maui—Lowland Dry—Unit 1, Maui—Lowland Dry—Unit 2, Maui—Lowland Dry—Unit 3, Maui—Lowland Dry—Unit 4, Maui—Lowland Wet—Unit 2, Maui—Lowland Wet—Unit 3, Maui—Lowland Wet—Unit 4, Maui—Lowland Wet—Unit 5, Maui—Lowland Wet—Unit 6, Maui—Lowland Wet—Unit 7, Maui—Lowland Wet—Unit 8, Maui—Montane Mesic—Unit 1, Maui—Montane Dry—Unit 1, Maui—Wet Cliff—Unit 5, Maui—Wet Cliff—Unit 6, Maui—Wet Cliff—Unit 7, and Maui—Wet Cliff—Unit 8, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Alectryon macrococcus* on Maui.

(i) In units Maui—Lowland Dry—Unit 1, Maui—Lowland Dry—Unit 2, Maui—Lowland Dry—Unit 3, and Maui—Lowland Dry—Unit 4, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Less than 50 in (130 cm).

(C) Substrate: Weathered silty loams to stony clay, rocky ledges, little-weathered lava.

(D) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus.*

(E) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia.*

(F) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Sicyos.*

(ii) In units Maui—Lowland Wet—Unit 2, Maui—Lowland Wet—Unit 3, Maui—Lowland Wet—Unit 4, Maui—Lowland Wet—Unit 5, Maui—Lowland Wet—Unit 6, Maui—Lowland Wet—Unit 7, and Maui—Lowland Wet—Unit 8, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

(iii) In unit Maui—Montane Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Deep ash deposits, thin silty loams.

(D) Canopy: *Acacia, Ilex, Metrosideros, Myrsine, Nestegis, Nothocestrum, Pisonia, Pittosporum, Psychotria, Sophora, Zanthoxylum.*

(E) Subcanopy: *Alyxia, Charpentiera, Coprosma, Dodonaea, Kadua, Labordia, Leptecophylla, Phyllostegia, Vaccinium.*

(F) Understory: Ferns, *Carex, Peperomia.*

(iv) In unit Maui—Montane Dry—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: Less than 50 in (130 cm).

(C) Substrate: Dry cinder or ash soils, loamy volcanic sands, blocky lava, rock outcroppings.

(D) Canopy: *Acacia, Metrosideros, Myoporum, Santalum, Sophora.*

(E) Subcanopy: *Chamaesyce, Coprosma, Dodonaea, Dubautia, Leptecophylla, Osteomeles, Wikstroemia.*

(F) Understory: *Bidens, Eragrostis, Melanthera, Vaccinium.*

(v) In units Maui—Wet Cliff—Unit 5, Maui—Wet Cliff—Unit 6, Maui—Wet Cliff—Unit 7, and Maui—Wet Cliff—Unit 8, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.

(D) Canopy: None.

(E) Subcanopy: *Broussaisia, Cheirodendron, Leptocophylla, Metrosideros.*

(F) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Family Solanaceae

Solanum incompletum (POPOLO KU MAI)

Maui—Lowland Dry—Unit 1, Maui—Lowland Dry—Unit 2, Maui—Lowland Dry—Unit 3, Maui—Lowland Dry—Unit 4, Maui—Lowland Mesic—Unit 1, Maui—Subalpine—Unit 1, and Maui—Subalpine—Unit 2, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Solanum incompletum* on Maui.

(i) In units Maui—Lowland Dry—Unit 1, Maui—Lowland Dry—Unit 2, Maui—Lowland Dry—Unit 3, and Maui—Lowland Dry—Unit 4, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Less than 50 in (130 cm).

(C) Substrate: Weathered silty loams to stony clay, rocky ledges, little-weathered lava.

(D) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus.*

(E) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia.*

(F) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Sicyos.*

(ii) In unit Maui—Lowland Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Shallow soils, little to no herbaceous layer.

(D) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(E) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(F) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

(iii) In units Maui—Subalpine—Unit 1 and Maui—Subalpine—Unit 2, the physical and biological features of critical habitat are:

(A) Elevation: 6,500 to 9,800 ft (2,000 to 3,000 m).

(B) Annual precipitation: 15 to 40 in (38 to 100 cm).

(C) Substrate: Dry ash; sandy loam; rocky, undeveloped soils; weathered lava.

(D) Canopy: *Chamaesyce, Chenopodium, Metrosideros, Myoporum, Santalum, Sophora.*

(E) Subcanopy: *Coprosma, Dodonaea, Dubautia, Geranium, Leptecophylla, Vaccinium, Wikstroemia.*

(F) Understory: Ferns, *Bidens, Carex, Deschampsia, Eragrostis, Gahnia, Luzula, Panicum, Pseudognaphalium, Sicyos, Tetramolopium.*

Family Thymelaeaceae

Wikstroemia villosa (AKIA)

Maui—Lowland Wet—Unit 1, Maui—Lowland Wet—Unit 2, Maui—Lowland Wet—Unit 3, Maui—Lowland Wet—Unit 4, Maui—Lowland Wet—Unit 5, Maui—Lowland Wet—Unit 6, Maui—Lowland Wet—Unit 7, Maui—Lowland Wet—Unit 8, Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2, Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, Maui—Montane Wet—Unit 5, and Maui—Montane Mesic—Unit 1, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Wikstroemia villosa* on Maui.

(i) In units Maui—Lowland Wet—Unit 1, Maui—Lowland Wet—Unit 2, Maui—Lowland Wet—Unit 3, Maui—Lowland Wet—Unit 4, Maui—Lowland Wet—Unit 5, Maui—Lowland Wet—Unit 6, Maui—Lowland Wet—Unit 7, and Maui—Lowland Wet—Unit 8, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

(ii) In units Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2, Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, and Maui—Montane Wet—Unit 5, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Well-developed soils, montane bogs.

(D) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(E) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(F) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

(iii) In unit Maui—Montane Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Deep ash deposits, thin silty loams.

(D) Canopy: *Acacia, Ilex, Metrosideros, Myrsine, Nestegis, Nothocestrum, Pisonia, Pittosporum, Psychotria, Sophora, Zanthoxylum.*

(E) Subcanopy: *Alyxia, Charpentiera, Coprosma, Dodonaea, Kadua, Labordia, Leptecophylla, Phyllostegia, Vaccinium.*

(F) Understory: Ferns, *Carex, Peperomia.*

Family Urticaceae

Neraudia sericea (NCN)

Maui—Lowland Dry—Unit 1, Maui—Lowland Dry—Unit 2, Maui—Lowland Dry—Unit 3, Maui—Lowland Dry—Unit 4, Maui—Lowland Dry—Unit 5, Maui—Lowland Dry—Unit 6, Kahoolawe—Lowland Dry—Unit 1, Kahoolawe—Lowland Dry—Unit 2, Maui—Montane Mesic—Unit 1, Maui—Dry Cliff—Unit 5, Maui—Dry Cliff—Unit 6, and Maui—Dry Cliff—Unit 7, identified in the legal descriptions in paragraphs (e)(1) and (e)(2) of this section, constitute critical habitat for *Neraudia sericea* on Maui and Kahoolawe.

(i) In units Maui—Lowland Dry—Unit 1, Maui—Lowland Dry—Unit 2, Maui—Lowland Dry—Unit 3, Maui—Lowland Dry—Unit 4, Maui—Lowland Dry—Unit 5, Maui—Lowland Dry—Unit 6, Kahoolawe—Lowland Dry—Unit 1, and Kahoolawe—Lowland Dry—Unit 2, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Less than 50 in (130 cm).

(C) Substrate: Weathered silty loams to stony clay, rocky ledges, little-weathered lava.

(D) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus.*

(E) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia.*

(F) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Sicyos.*

(ii) In unit Maui—Montane Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Deep ash deposits, thin silty loams.

(D) Canopy: *Acacia, Ilex, Metrosideros, Myrsine, Nestegis, Nothocestrum, Pisonia, Pittosporum, Psychotria, Sophora, Zanthoxylum.*

(E) Subcanopy: *Alyxia, Charpentiera, Coprosma, Dodonaea, Kadua, Labordia, Leptecophylla, Phyllostegia, Vaccinium.*

(F) Understory: Ferns, *Carex, Peperomia.*

(iii) In units Maui—Dry Cliff—Unit 5, Maui—Dry Cliff—Unit 6, and Maui—Dry Cliff—Unit 7, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Less than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, rocky talus.

(D) Canopy: None.

(E) Subcanopy: *Antidesma, Chamaesyce, Diospyros, Dodonaea.*

(F) Understory: *Bidens, Eragrostis, Melanthera, Schiedea.*

Family Violaceae

Isodendrion pyrifolium (WAHINE NOHO KULA)

Maui—Lowland Wet—Unit 2, Maui—Lowland Wet—Unit 3, Maui—Lowland Wet—Unit 4, Maui—Lowland Wet—Unit 5, Maui—Lowland Wet—Unit 6, Maui—Lowland Wet—Unit 7, Maui—Lowland Wet—Unit 8, Maui—Dry Cliff—Unit 5, Maui—Dry Cliff—Unit 6, Maui—Dry Cliff—Unit 7, Maui—Wet Cliff—Unit 5, Maui—Wet Cliff—Unit 6, Maui—Wet Cliff—Unit 7, and Maui—Wet Cliff—Unit 8, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Isodendrion pyrifolium* on Maui.

(i) In units Maui—Lowland Wet—Unit 2, Maui—Lowland Wet—Unit 3, Maui—Lowland Wet—Unit 4, Maui—Lowland Wet—Unit 5, Maui—Lowland Wet—Unit 6, Maui—Lowland Wet—Unit 7, and Maui—Lowland Wet—Unit 8, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

(ii) In units Maui—Dry Cliff—Unit 5, Maui—Dry Cliff—Unit 6, and Maui—Dry Cliff—Unit 7, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Less than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, rocky talus.

(D) Canopy: None.

(E) Subcanopy: *Antidesma, Chamaesyce, Diospyros, Dodonaea.*

(F) Understory: *Bidens, Eragrostis, Melanthera, Schiedea.*

(iii) In units Maui—Wet Cliff—Unit 5, Maui—Wet Cliff—Unit 6, Maui—Wet Cliff—Unit 7, and Maui—Wet Cliff—Unit 8, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.

(D) Canopy: None.

(E) Subcanopy: *Broussaisia, Cheirodendron, Leptocophylla, Metrosideros.*

(F) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

(2) *Ferns and allies.*

Family Adiantaceae

Pteris lidgatei (NCN)

Maui—Lowland Wet—Unit 2, Maui—Lowland Wet—Unit 3, Maui—Lowland Wet—Unit 4, Maui—Lowland Wet—Unit 5, Maui—Lowland Wet—Unit 6, Maui—Lowland Wet—Unit 7, Maui—Lowland Wet—Unit 8, Maui—Wet Cliff—Unit 5, Maui—Wet Cliff—Unit 6, Maui—Wet Cliff—Unit 7, and Maui—Wet Cliff—Unit 8, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Pteris lidgatei* on Maui.

(i) In units Maui—Lowland Wet—Unit 2, Maui—Lowland Wet—Unit 3, Maui—Lowland Wet—Unit 4, Maui—Lowland Wet—Unit 5, Maui—Lowland Wet—Unit 6, Maui—Lowland Wet—Unit 7, and Maui—Lowland Wet—Unit 8, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

(ii) In units Maui—Wet Cliff—Unit 5, Maui—Wet Cliff—Unit 6, Maui—Wet Cliff—Unit 7, and Maui—Wet Cliff—Unit 8, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.

(D) Canopy: None.

(E) Subcanopy: *Broussaisia, Cheirodendron, Leptocophylla, Metrosideros.*

(F) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Family Aspleniaceae

Asplenium dielerectum (ASPLENIUM-LEAVED DIELLIA)

Maui—Lowland Dry—Unit 5, Maui—Lowland Dry—Unit 6, Maui—Lowland Mesic—Unit 2, Maui—Lowland Mesic—Unit 3, Maui—Lowland Wet—Unit 2, Maui—Lowland Wet—Unit 3, Maui—Lowland Wet—Unit 4, Maui—Lowland Wet—Unit 5, Maui—Lowland Wet—Unit 6, Maui—Lowland Wet—Unit 7, Maui—Lowland Wet—Unit 8, and Maui—Montane Mesic—Unit 1, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Asplenium dielerectum* on Maui.

(i) In units Maui—Lowland Dry—Unit 5 and Maui—Lowland Dry—Unit 6, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Less than 50 in (130 cm).

(C) Substrate: Weathered silty loams to stony clay, rocky ledges, little-weathered lava.

(D) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus.*

(E) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia.*

(F) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Sicyos.*

(ii) In units Maui—Lowland Mesic—Unit 2 and Maui—Lowland Mesic—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Shallow soils, little to no herbaceous layer.

(D) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(E) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(F) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

(iii) In units Maui—Lowland Wet—Unit 2, Maui—Lowland Wet—Unit 3, Maui—Lowland Wet—Unit 4, Maui—Lowland Wet—Unit 5, Maui—Lowland Wet—Unit 6, Maui—Lowland Wet—Unit 7, and Maui—Lowland Wet—Unit 8, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

(iv) In unit Maui—Montane Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Deep ash deposits, thin silty loams.

(D) Canopy: *Acacia, Ilex, Metrosideros, Myrsine, Nestegis, Nothocestrum, Pisonia, Pittosporum, Psychotria, Sophora, Zanthoxylum.*

(E) Subcanopy: *Alyxia, Charpentiera, Coprosma, Dodonaea, Kadua, Labordia, Leptecophylla, Phyllostegia, Vaccinium.*

(F) Understory: Ferns, *Carex, Peperomia.*

Asplenium peruvianum var. *insulare* (NCN)

Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2, Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, Maui—Montane Wet—Unit 5, Maui—Montane Mesic—Unit 1, Maui—Subalpine—Unit 1, and Maui—Subalpine—Unit 2, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Asplenium peruvianum* var. *insulare* on Maui.

(i) In units Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2, Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, and Maui—Montane Wet—Unit 5, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Well-developed soils, montane bogs.

(D) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(E) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(F) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

(ii) In unit Maui—Montane Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Deep ash deposits, thin silty loams.

(D) Canopy: *Acacia, Ilex, Metrosideros, Myrsine, Nestegis, Nothocestrum, Pisonia, Pittosporum, Psychotria, Sophora, Zanthoxylum.*

(E) Subcanopy: *Alyxia, Charpentiera, Coprosma, Dodonaea, Kadua, Labordia, Leptecophylla, Phyllostegia, Vaccinium.*

(F) Understory: Ferns, *Carex, Peperomia.*

(iii) In units Maui—Subalpine—Unit 1 and Maui—Subalpine—Unit 2, the physical and biological features of critical habitat are:

(A) Elevation: 6,500 to 9,800 ft (2,000 to 3,000 m).

(B) Annual precipitation: 15 to 40 in (38 to 100 cm).

(C) Substrate: Dry ash; sandy loam; rocky, undeveloped soils; weathered lava.

(D) Canopy: *Chamaesyce, Chenopodium, Metrosideros, Myoporum, Santalum, Sophora.*

(E) Subcanopy: *Coprosma, Dodonaea, Dubautia, Geranium, Leptecophylla, Vaccinium, Wikstroemia.*

(F) Understory: Ferns, *Bidens, Carex, Deschampsia, Eragrostis, Gahnia, Luzula, Panicum, Pseudognaphalium, Sicyos, Tetramolopium.*

Ctenitis squamigera (PAUOA)

Maui—Lowland Dry—Unit 1, Maui—Lowland Dry—Unit 2, Maui—Lowland Dry—Unit 3, Maui—Lowland Dry—Unit 4, Maui—Lowland Dry—Unit 5, Maui—Lowland Dry—Unit 6, Maui—Lowland Mesic—Unit 1, Maui—Lowland Mesic—Unit 2, Maui—Lowland Mesic—Unit 3, Maui—Lowland Wet—Unit 2, Maui—Lowland Wet—Unit 3, Maui—Lowland Wet—Unit 4, Maui—Lowland Wet—Unit 5, Maui—Lowland Wet—Unit 6, Maui—Lowland Wet—Unit 7, Maui—Lowland Wet—Unit 8, Maui—Montane Mesic—Unit 2, Maui—Montane Mesic—Unit 3, Maui—Montane Mesic—Unit 4, Maui—Montane Mesic—Unit 5, Maui—Montane Mesic—Unit 6, Maui—Wet Cliff—Unit 5, Maui—Wet Cliff—Unit 6, Maui—Wet Cliff—Unit 7, and Maui—Wet Cliff—Unit 8, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Ctenitis squamigera* on Maui.

(i) In units Maui—Lowland Dry—Unit 1, Maui—Lowland Dry—Unit 2, Maui—Lowland Dry—Unit 3, Maui—Lowland Dry—Unit 4, Maui—Lowland Dry—Unit 5, and Maui—Lowland Dry—Unit 6, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Less than 50 in (130 cm).

(C) Substrate: Weathered silty loams to stony clay, rocky ledges, little-weathered lava.

(D) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus.*

(E) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia.*

(F) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Sicyos.*

(ii) In units Maui—Lowland Mesic—Unit 1, Maui—Lowland Mesic—Unit 2, and Maui—Lowland Mesic—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Shallow soils, little to no herbaceous layer.

(D) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(E) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(F) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

(iii) In units Maui—Lowland Wet—Unit 2, Maui—Lowland Wet—Unit 3, Maui—Lowland Wet—Unit 4, Maui—Lowland Wet—Unit 5, Maui—Lowland Wet—Unit 6, Maui—Lowland Wet—Unit 7, and Maui—Lowland Wet—Unit 8, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

(iv) In units Maui—Montane Mesic—Unit 2, Maui—Montane Mesic—Unit 3, Maui—Montane Mesic—Unit 4, Maui—Montane Mesic—Unit 5, and Maui—Montane Mesic—Unit 6, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Deep ash deposits, thin silty loams.

(D) Canopy: *Acacia, Ilex, Metrosideros, Myrsine, Nestegis, Nothocestrum, Pisonia, Pittosporum, Psychotria, Sophora, Zanthoxylum.*

(E) Subcanopy: *Alyxia, Charpentiera, Coprosma, Dodonaea, Kadua, Labordia, Leptecophylla, Phyllostegia, Vaccinium.*

(F) Understory: Ferns, *Carex, Peperomia.*

(v) In units Maui—Wet Cliff—Unit 5, Maui—Wet Cliff—Unit 6, Maui—Wet Cliff—Unit 7, and Maui—Wet Cliff—Unit 8, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.

(D) Canopy: None.

(E) Subcanopy: *Broussaisia, Cheirodendron, Leptocophylla, Metrosideros.*

(F) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Diplazium molokaiense (NCN)

Maui—Lowland Wet—Unit 2, Maui—Lowland Wet—Unit 3, Maui—Lowland Wet—Unit 4, Maui—Lowland Wet—Unit 5, Maui—Lowland Wet—Unit 6, Maui—Lowland Wet—Unit 7, Maui—Lowland Wet—Unit 8, Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2, Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, Maui—Montane Wet—Unit 5, Maui—Montane Mesic—Unit 1, Maui—Montane Mesic—Unit 2, Maui—Montane Mesic—Unit 3, Maui—Montane Mesic—Unit 4, Maui—Montane Mesic—Unit 5, Maui—Montane Mesic—Unit 6, Maui—Dry Cliff—Unit 1, Maui—Dry Cliff—Unit 2, Maui—Dry Cliff—Unit 3, Maui—Dry Cliff—Unit 4, Maui—Dry Cliff—Unit 5, Maui—Dry Cliff—Unit 6, and Maui—Dry Cliff—Unit 7, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Diplazium molokaiense* on Maui.

(i) In units Maui—Lowland Wet—Unit 2, Maui—Lowland Wet—Unit 3, Maui—Lowland Wet—Unit 4, Maui—Lowland Wet—Unit 5, Maui—Lowland Wet—Unit 6, Maui—Lowland Wet—Unit 7, and Maui—Lowland Wet—Unit 8, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

(ii) In units Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2, Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, and Maui—Montane Wet—Unit 5, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Well-developed soils, montane bogs.

(D) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(E) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(F) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

(iii) In units Maui—Montane Mesic—Unit 1, Maui—Montane Mesic—Unit 2, Maui—Montane Mesic—Unit 3, Maui—Montane Mesic—Unit 4, Maui—Montane Mesic—Unit 5, and Maui—Montane Mesic—Unit 6, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Deep ash deposits, thin silty loams.

(D) Canopy: *Acacia, Ilex, Metrosideros, Myrsine, Nestegis, Nothocestrum, Pisonia, Pittosporum, Psychotria, Sophora, Zanthoxylum.*

(E) Subcanopy: *Alyxia, Charpentiera, Coprosma, Dodonaea, Kadua, Labordia, Leptecophylla, Phyllostegia, Vaccinium.*

(F) Understory: Ferns, *Carex, Peperomia.*

(iv) In units Maui—Dry Cliff—Unit 1, Maui—Dry Cliff—Unit 2, Maui—Dry Cliff—Unit 3, Maui—Dry Cliff—Unit 4, Maui—Dry Cliff—Unit 5, Maui—Dry Cliff—Unit 6, and Maui—Dry Cliff—Unit 7, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Less than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, rocky talus.

(D) Canopy: None.

(E) Subcanopy: *Antidesma, Chamaesyce, Diospyros, Dodonaea.*

(F) Understory: *Bidens, Eragrostis, Melanthera, Schiedea.*

Family Grammitidaceae

Adenophorus periens (PENDANT KIHI FERN)

Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2, Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, and Maui—Montane Wet—Unit 5, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Adenophorus periens* on Maui. In units Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2, Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, and Maui—Montane Wet—Unit 5, the physical and biological features of critical habitat are:

(i) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(ii) Annual precipitation: Greater than 75 in (190 cm).

(iii) Substrate: Well-developed soils, montane bogs.

(iv) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(v) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(vi) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

Family Lycopodiaceae

Huperzia mannii (WAWAEIOLE)

Maui—Lowland Mesic—Unit 1, Maui—Lowland Wet—Unit 1, Maui—Lowland Wet—Unit 2, Maui—Lowland Wet—Unit 3, Maui—Lowland Wet—Unit 4, Maui—Lowland Wet—Unit 5, Maui—Lowland Wet—Unit 6, Maui—Lowland Wet—Unit 7, Maui—Lowland Wet—Unit 8, Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2, Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, Maui—Montane Wet—Unit 5, Maui—Montane Wet—Unit 6, Maui—Montane Wet—Unit 7, Maui—Montane Wet—Unit 8, Maui—Montane Mesic—Unit 1, Maui—Montane Mesic—Unit 2, Maui—Montane Mesic—Unit 3, Maui—Montane Mesic—Unit 4, Maui—Montane Mesic—Unit 5, and Maui—Montane Mesic—Unit 6, identified in the legal descriptions in paragraph (e)(1) of this section, constitute critical habitat for *Huperzia mannii* on Maui.

(i) In unit Maui—Lowland Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Shallow soils, little to no herbaceous layer.

(D) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(E) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(F) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

(ii) In units Maui—Lowland Wet—Unit 1, Maui—Lowland Wet—Unit 2, Maui—Lowland Wet—Unit 3, Maui—Lowland Wet—Unit 4, Maui—Lowland Wet—Unit 5, Maui—Lowland Wet—

Unit 6, Maui—Lowland Wet—Unit 7, and Maui—Lowland Wet—Unit 8, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

(iii) In units Maui—Montane Wet—Unit 1, Maui—Montane Wet—Unit 2, Maui—Montane Wet—Unit 3, Maui—Montane Wet—Unit 4, Maui—Montane Wet—Unit 5, Maui—Montane Wet—Unit 6, Maui—Montane Wet—Unit 7, and Maui—Montane Wet—Unit 8, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Well-developed soils, montane bogs.

(D) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(E) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(F) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

(iv) In units Maui—Montane Mesic—Unit 1, Maui—Montane Mesic—Unit 2, Maui—Montane Mesic—Unit 3, Maui—Montane Mesic—Unit 4, Maui—Montane Mesic—Unit 5, and Maui—Montane Mesic—Unit 6, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Deep ash deposits, thin silty loams.

(D) Canopy: *Acacia, Ilex, Metrosideros, Myrsine, Nestegis, Nothocestrum, Pisonia, Pittosporum, Psychotria, Sophora, Zanthoxylum.*

(E) Subcanopy: *Alyxia, Charpentiera, Coprosma, Dodonaea, Kadua, Labordia, Leptecophylla, Phyllostegia, Vaccinium.*

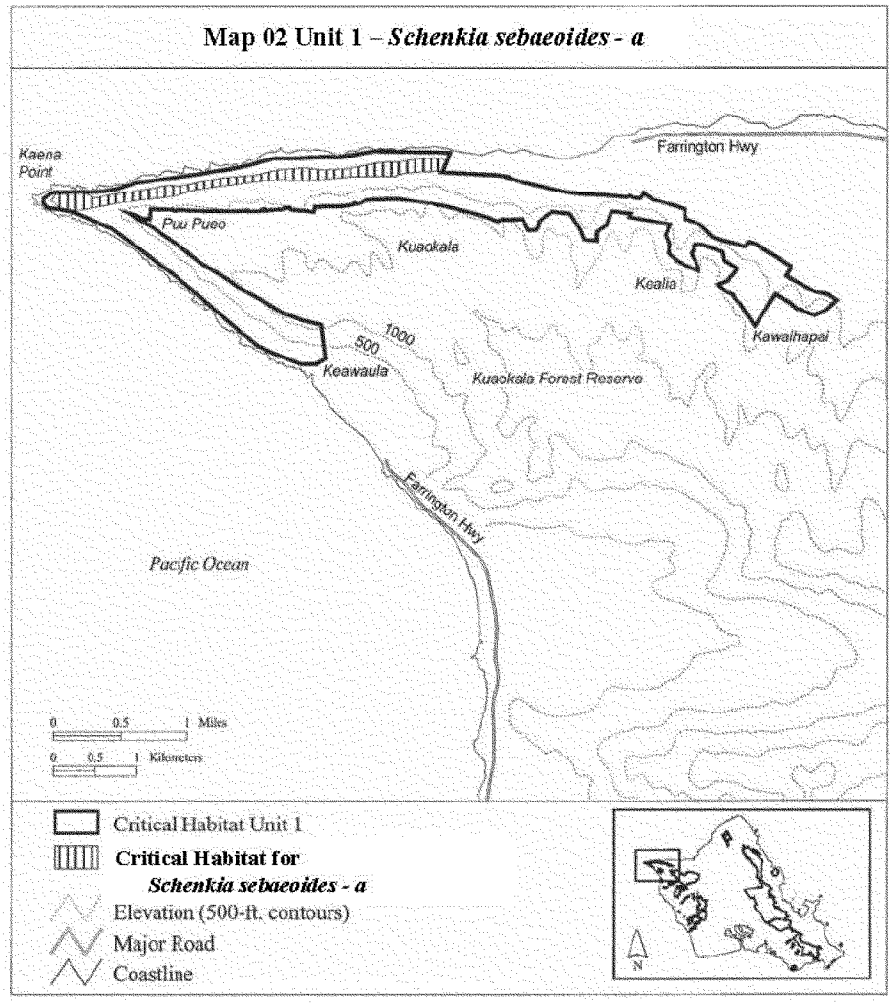
(F) Understory: Ferns, *Carex, Peperomia.*

* * * * *

(i) * * *

(2) * * *

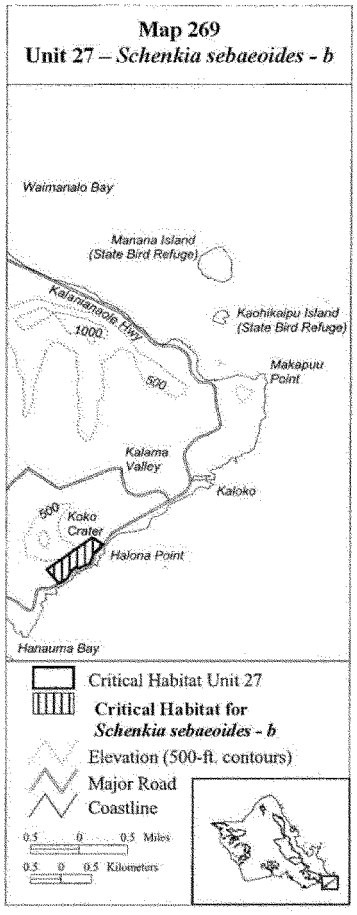
(ii) *Note:* Map 2 follows:



* * * * *

(269) * * *

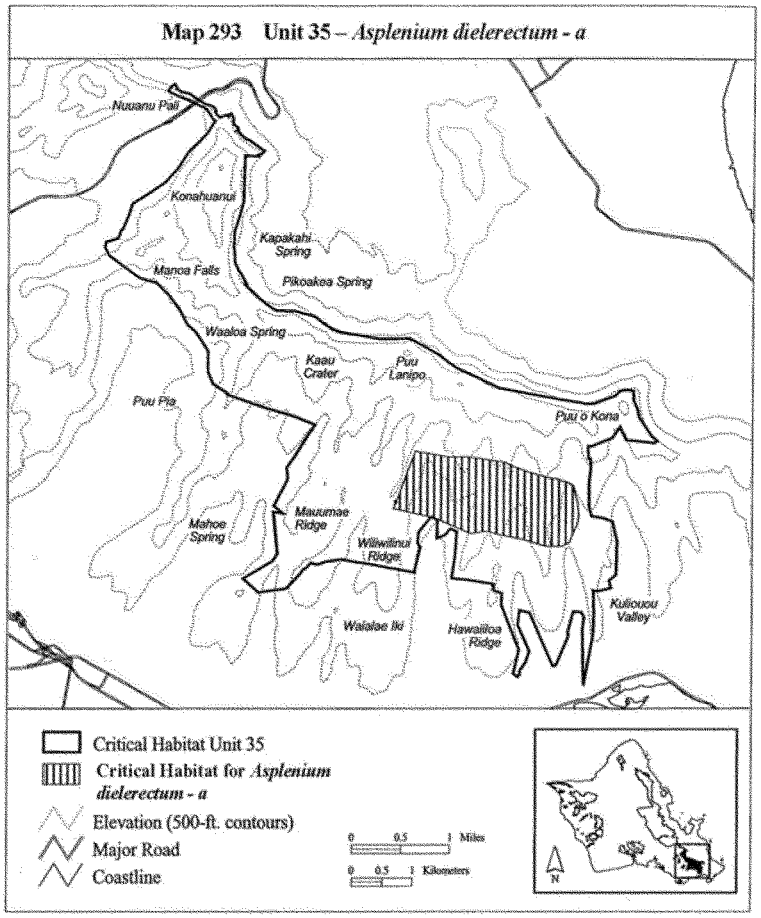
(ii) *Note:* Map 269 follows:



* * * * *

(293) * * *

(ii) *Note:* Map 293 follows:

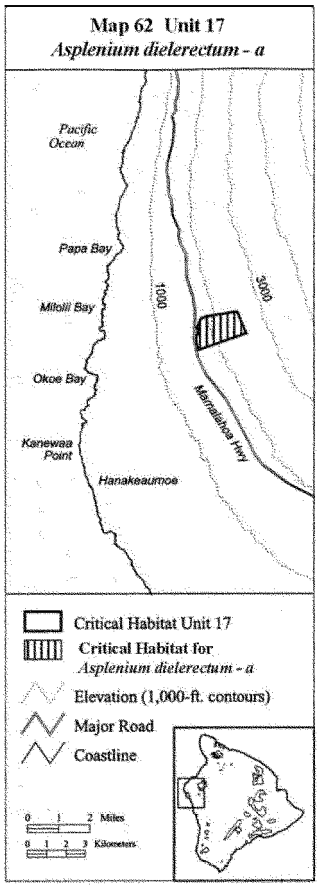

Map 293 Unit 35 – *Asplenium dielerectum - a*
Nuuanu Pali
Konahuanui
Kapakahi Spring
Manoa Falls
Pikoakea Spring
Waaloa Spring
Kaau Crater
Puu Lanipo
Puu Pia
Puu o Kona
Mauumae Ridge
Mahoe Spring
Willwillnui Ridge
Waialae Iki
Hawaiiloa Ridge
Kuliouou Valley
Critical Habitat Unit 35
Critical Habitat for *Asplenium dielerectum - a*
Elevation (500-ft. contours)
Major Road
Coastline
0 0.5 1 Miles
0 0.5 1 Kilometers
N

* * * * *

(k) * * *

(62) * * *

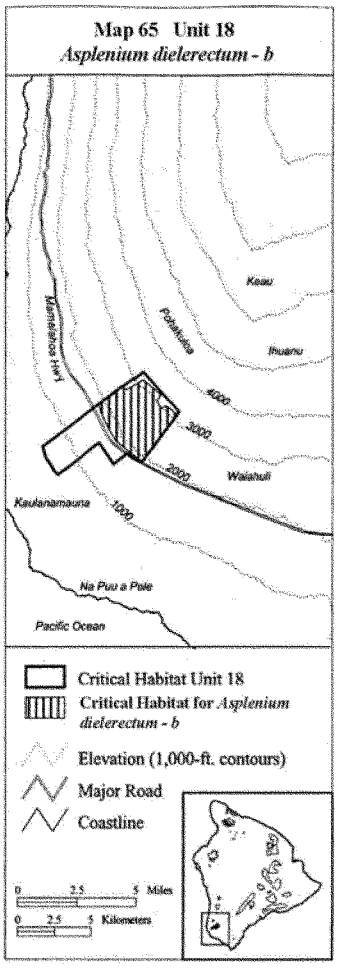
(ii) *Note:* Map 62 follows:



* * * * *

(65) * * *

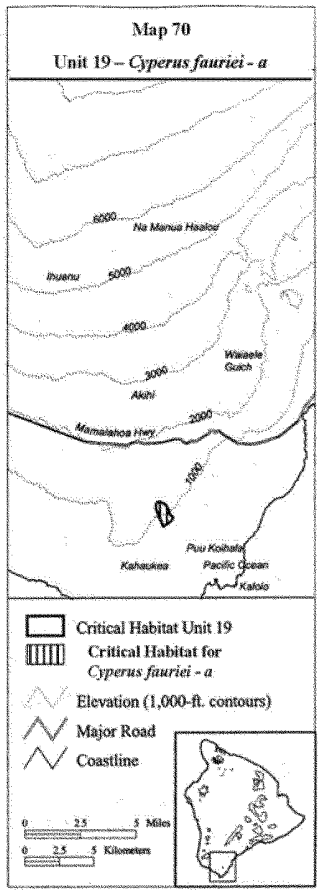
(ii) *Note:* Map 65 follows:



* * * * *

(70) * * *

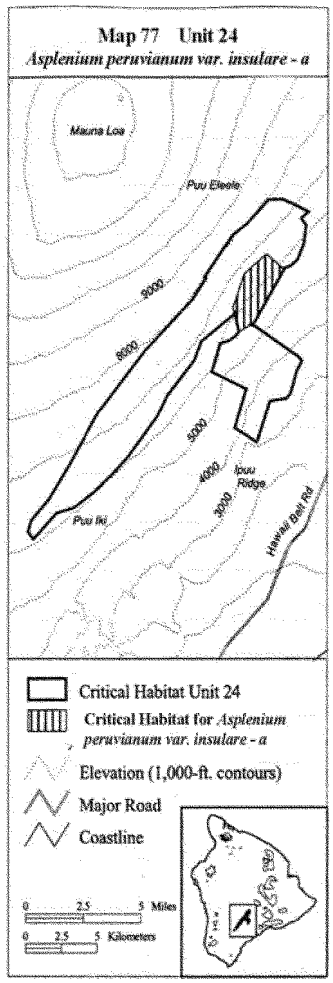
(ii) *Note:* Map 70 follows:



* * * * *

(77) * * *

(ii) *Note:* Map 77 follows:



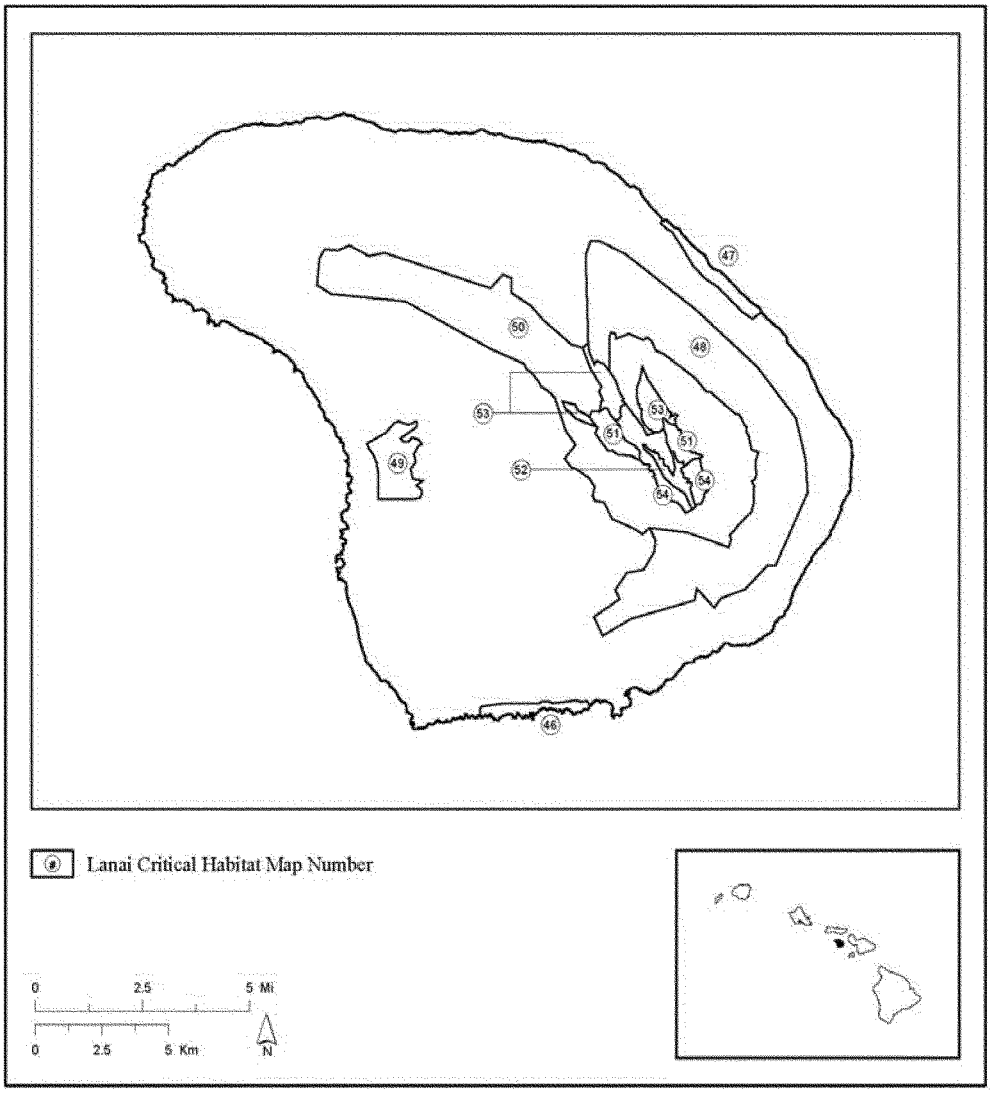
* * * * *

(m) *Maps and critical habitat unit descriptions for the island of Lanai, HI.* Critical habitat units are described below. Coordinates are in UTM Zone 4 with units in meters using North American Datum of 1983 (NAD83). The following map shows the general locations of the critical habitat units designated on the island of Lanai. Existing manmade features and structures, such as buildings, roads, railroads, airports, runways, other paved areas, lawns, and other urban landscaped areas, do not contain one or more of the physical and biological features. Federal actions limited to those areas, therefore, would not trigger a consultation under section 7 of the Act unless they may affect the species or physical or biological features in adjacent critical habitat.

(1) NOTE: Map 1, Index map, follows:

Map 1

Lanai Critical Habitat–Island Index Map



(2) Lanai—Coastal—Unit 1 (373 ac, 151 ha) and Lanai—Coastal—Unit 2 (2 ac; 1 ha)

(i) [Reserved for textual description of Unit 1.] This unit is critical habitat for *Canavalia pubescens, Hibiscus brackenridgei, Portulaca sclerocarpa,* and *Sesbania tomentosa.*

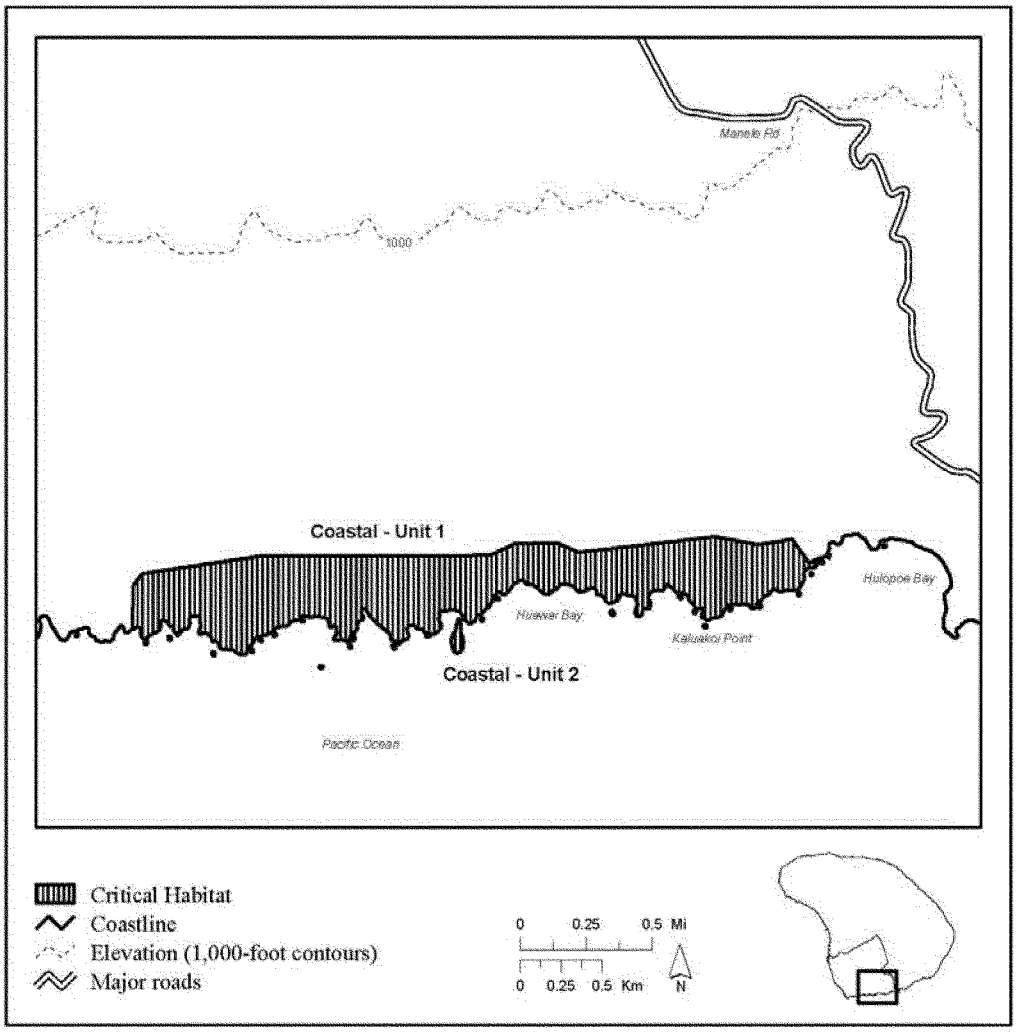
(ii) [Reserved for textual description of Unit 2.] This unit is critical habitat for *Canavalia pubescens, Hibiscus brackenridgei, Portulaca sclerocarpa,* and *Sesbania tomentosa.*

(iii) NOTE: Map of Lanai—Coastal—Unit 1 and Lanai—Coastal—Unit 2 (Map 2) follows:

Map 2

Lanai–Coastal

Unit 1 and Unit 2



(3) Lanai—Coastal—Unit 3 (509 ac, 206 ha).

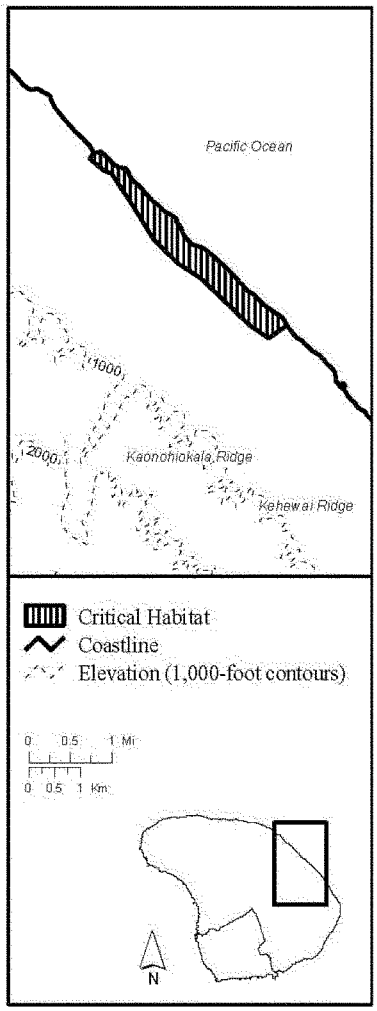
(i) [Reserved for textual description of Unit 3.] This unit is critical habitat for *Canavalia pubescens, Hibiscus brackenridgei, Portulaca sclerocarpa,* and *Sesbania tomentosa.*

(ii) NOTE: Map of Lanai—Coastal—Unit 3 (Map 3) follows:

Map 3

Lanai–Coastal

Unit 3



(4) Lanai—Lowland Dry—Unit 1 (9,766 ac, 3,952 ha)

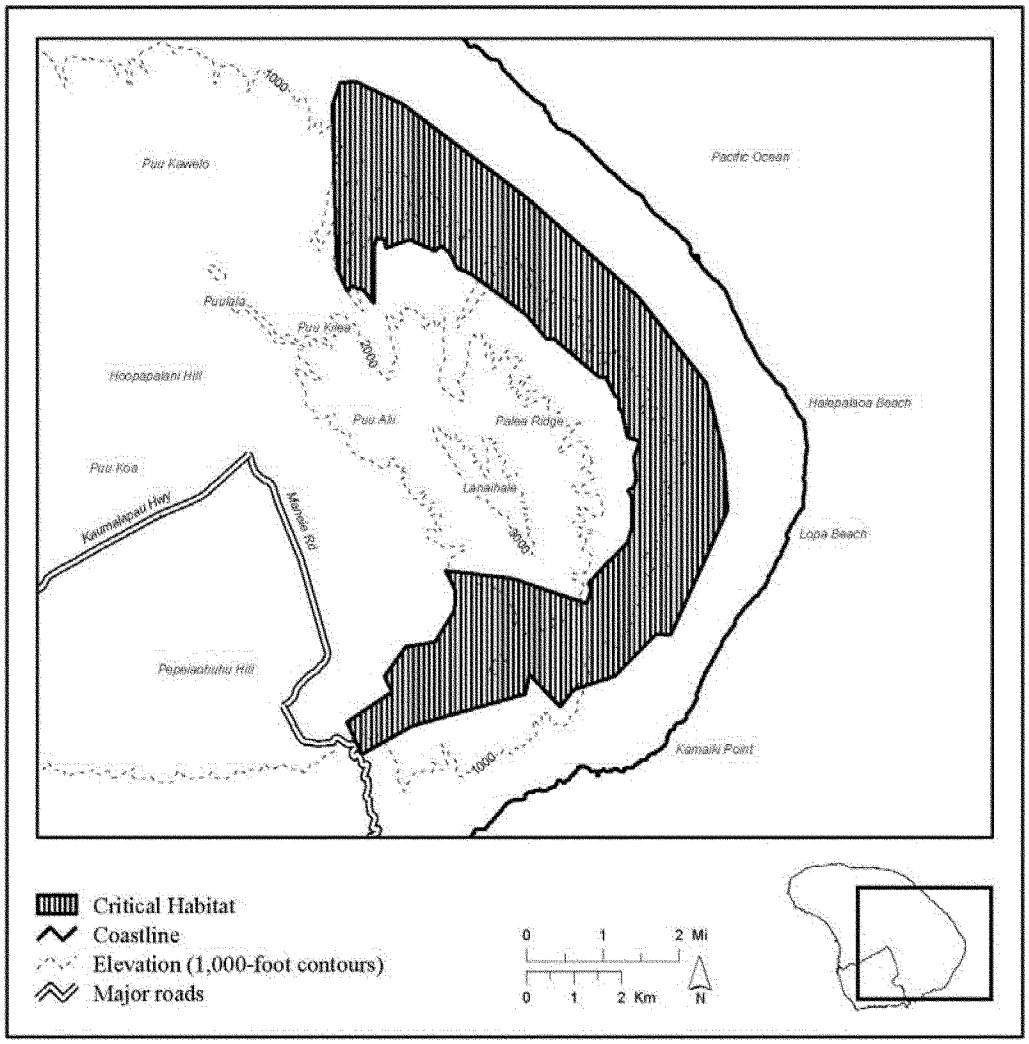
(i) [Reserved for textual description of Unit 1.] This unit is critical habitat for *Abutilon eremitopetalum, Asplenium dielerectum, Bidens micrantha* ssp. *kalealaha, Cyperus fauriei, Cyperus trachysanthos, Hibiscus brackenridgei, Neraudia sericea, Pleomele fernaldii, Schenkia sebaeoides, Sesbania tomentosa, Silene lanceolata, Solanum incompletum, Spermolepis hawaiiensis, Tetramolopium lepidotum* ssp. *lepitodotum, Tetramolopium remyi,* and *Vigna o-wahuensis.*

(ii) NOTE: Map of Lanai—Lowland Dry—Unit 1 (Map 4) follows:

Map 4

Lanai–Lowland Dry

Unit 1



(5) Lanai—Lowland Dry—Unit 2 (939 ac, 380 ha)

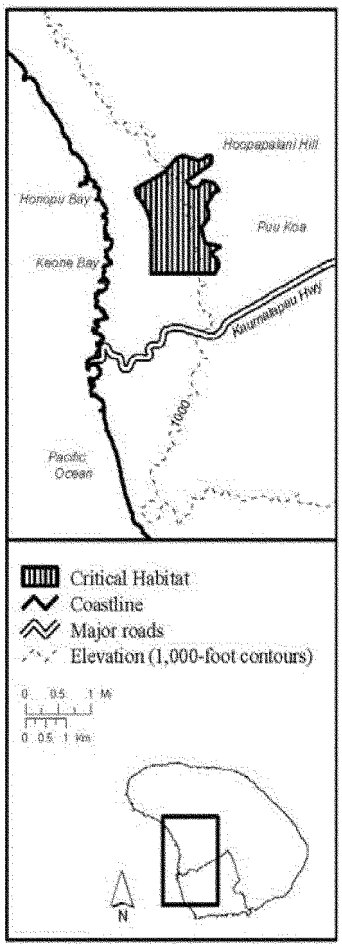
(i) [Reserved for textual description of Unit 2.] This unit is critical habitat for *Abutilon eremitopetalum, Asplenium dielerectum, Bidens micrantha* ssp. *kalealaha, Cyperus fauriei, Cyperus trachysanthos, Hibiscus brackenridgei, Neraudia sericea, Pleomele fernaldii, Schenkia sebaeoides, Sesbania tomentosa, Silene lanceolata, Solanum incompletum, Spermolepis hawaiiensis, Tetramolopium lepidotum* ssp. *lepitodotum, Tetramolopium remyi,* and *Vigna o-wahuensis.*

(ii) NOTE: Map of Lanai—Lowland Dry—Unit 2 (Map 5) follows:

Map 5

Lanai–Lowland Dry

Unit 2



(6) Lanai—Lowland Mesic—Unit 1 (11,172 ac, 4,521 ha)

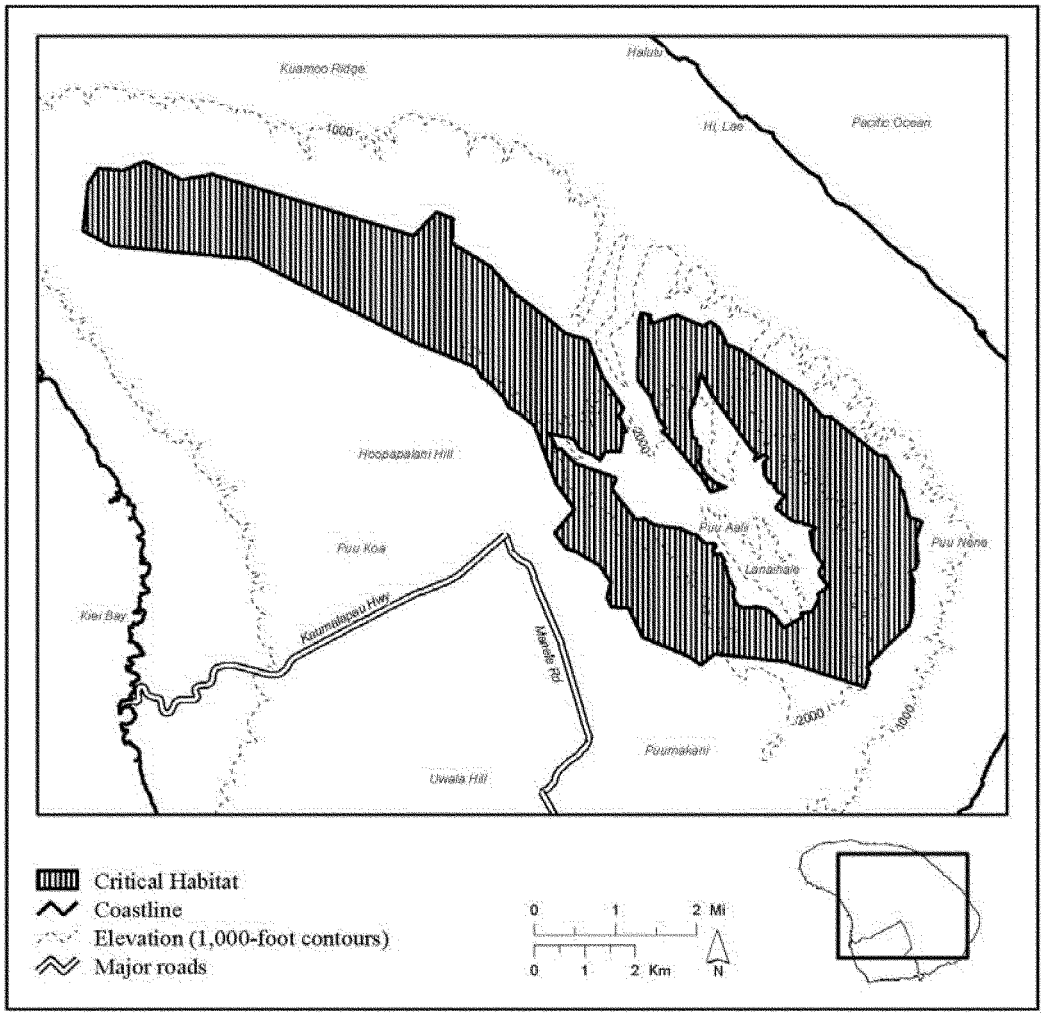
(i) [Reserved for textual description of Unit 1.] This unit is critical habitat for *Bidens micrantha* ssp. *kalealaha, Bonamia menziesii, Cenchrus agrimonioides, Clermontia oblongifolia* ssp. *mauiensis, Diplazium molokaiense, Kadua cordata* ssp. *remyi, Kadua laxiflora, Labordia tinifolia* var. *lanaiensis, Pleomele fernaldii, Santalum haleakalae* var. *lanaiense, Solanum incompletum, Spermolepis hawaiiensis,* and *Vigna o-wahuensis.*

(ii) NOTE: Map of Lanai—Lowland Mesic—Unit 1 (Map 6) follows:

Map 6

Lanai–Lowland Mesic

Unit 1



(7) Lanai—Lowland Wet—Unit 1 (374 ac, 152 ha) and Lanai—Lowland Wet—Unit 2 (232 ac, 94 ha)

(i) [Reserved for textual description of Unit 1.] This unit is critical habitat for *Clermonita oblongifolia* ssp. *mauiensis, Kadua cordata* ssp. *remyi, Kadua laxiflora, Labordia tinifolia* var. *lanaiensis, Pleomele fernaldii, Santalum haleakalae* var. *lanaiense,* and *Zanthoxylum hawaiiense.*

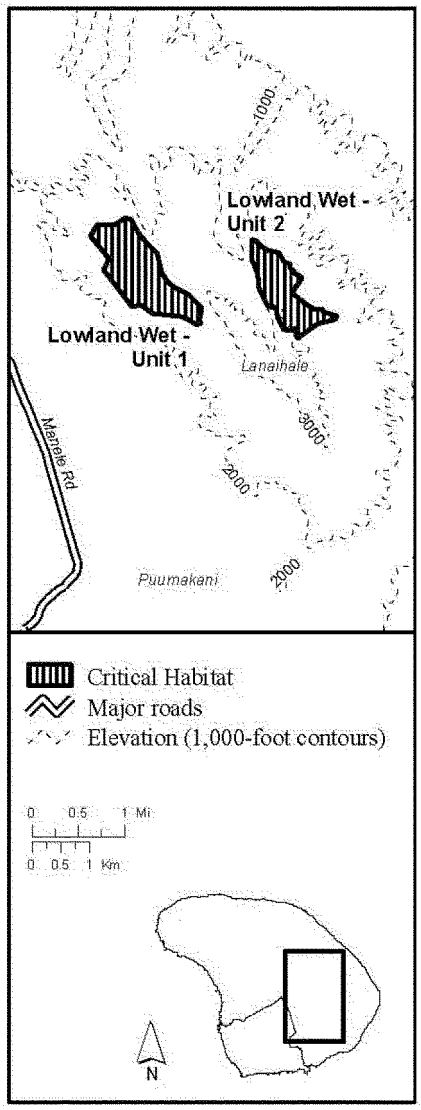
(ii) [Reserved for textual description of Unit 2.] This unit is critical habitat for *Clermonita oblongifolia* ssp. *mauiensis, Kadua cordata* ssp. *remyi, Kadua laxiflora, Labordia tinifolia* var. *lanaiensis, Pleomele fernaldii, Santalum haleakalae* var. *lanaiense,* and *Zanthoxylum hawaiiense.*

(iii) NOTE: Map of Lanai—Lowland Wet—Unit 1 and Lanai—Lowland Wet—Unit 2 (Map 7) follows:

Map 7

Lanai–Lowland Wet

Unit 1 and Unit 2



(8) Lanai—Montane Wet—Unit 1 (248 ac, 101 ha)

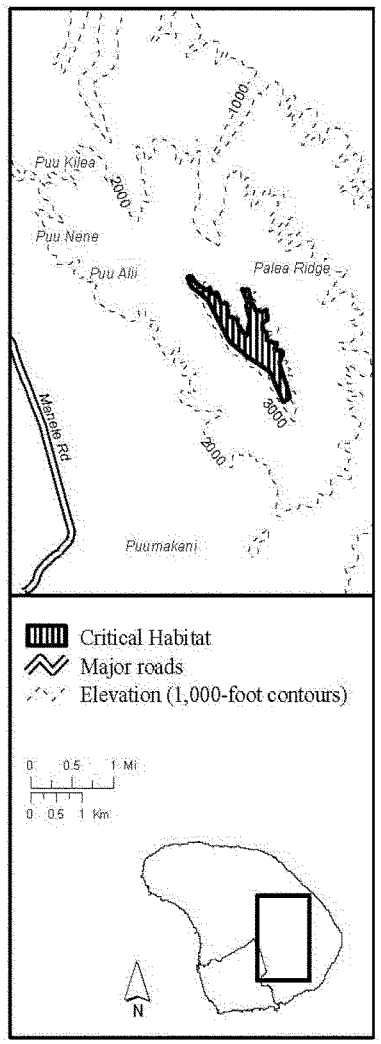
(i) [Reserved for textual description of Unit 1.] This unit is critical habitat for *Adenophorus periens, Cyanea gibsonii, Cyanea lobata, Cyrtandra munroi, Kadua laxiflora, Labordia tinifolia* var. *lanaiensis, Melicope munroi, Santalum haleakalae* var. *lanaiense,* and *Viola lanaiensis.*

(ii) NOTE: Map of Lanai—Montane Wet—Unit 1 (Map 8) follows:

Map 8

Lanai–Montane Wet

Unit 1



(9) Lanai—Dry Cliff—Unit 1 (83 ac, 34 ha), Lanai—Dry Cliff—Unit 2 (354 ac, 143 ha), and Lanai—Dry Cliff—Unit 3 (398 ac, 161 ha)

(i) [Reserved for textual description of Unit 1.] This unit is critical habitat for *Asplenium dielerectum, Bidens micrantha* ssp. *kalealaha, Brighamia rockii, Ctenitis squamigera, Diplazium molokaiense, Neraudia sericea, Phyllostegia haliakalae, Pleomele fernaldii, Solanum incompletum,* and *Viola lanaiensis.*

(ii) [Reserved for textual description of Unit 2.] This unit is critical habitat for *Asplenium dielerectum, Bidens micrantha* ssp. *kalealaha, Brighamia rockii, Ctenitis squamigera, Diplazium molokaiense, Neraudia sericea, Phyllostegia haliakalae, Pleomele fernaldii, Solanum incompletum,* and *Viola lanaiensis.*

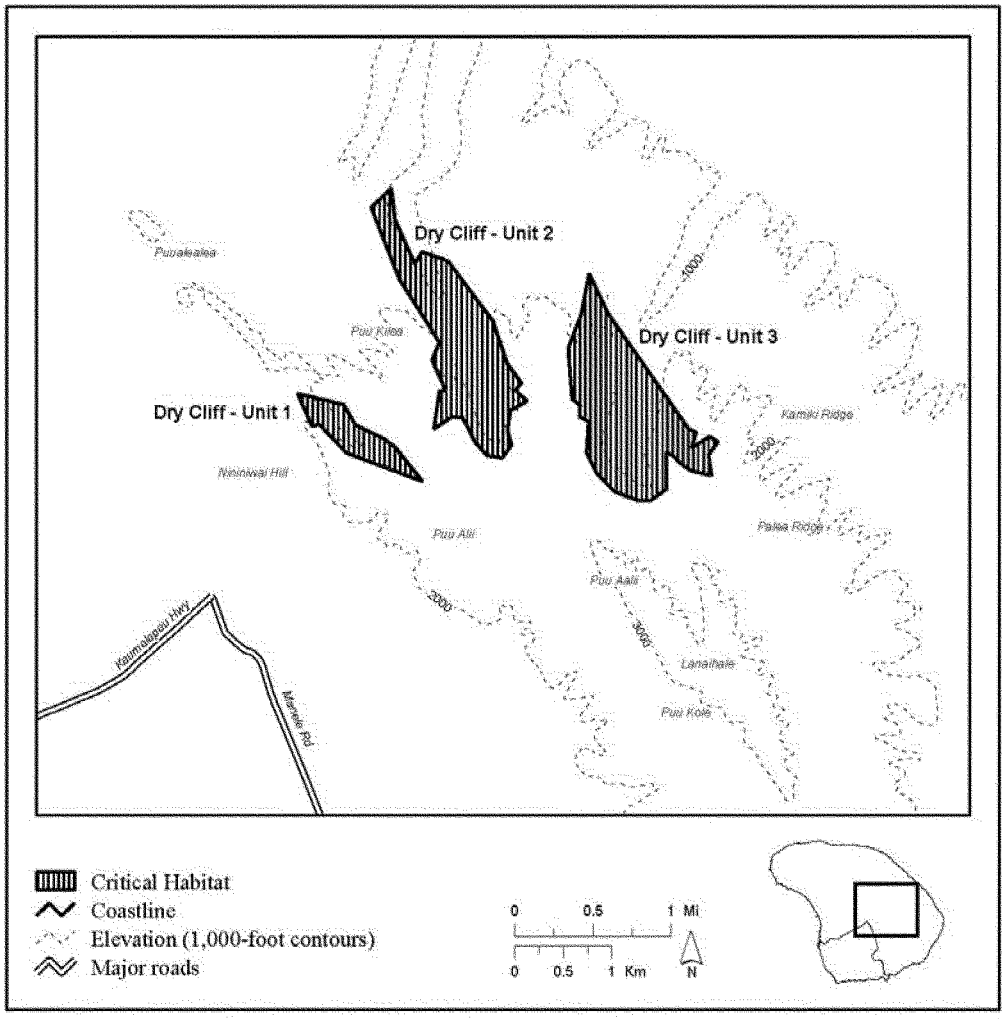
(iii) [Reserved for textual description of Unit 3.] This unit is critical habitat for *Asplenium dielerectum, Bidens micrantha* ssp. *kalealaha, Brighamia rockii, Ctenitis squamigera, Diplazium molokaiense, Neraudia sericea, Phyllostegia haliakalae, Pleomele fernaldii, Solanum incompletum,* and *Viola lanaiensis.*

(iv) NOTE: Map of Lanai—Dry Cliff—Unit 1, Lanai—Dry Cliff—Unit 2, and Lanai—Dry Cliff—Unit 3 (Map 9) follows:

Map 9

Lanai–Dry Cliff

Unit 1, Unit 2 and Unit 3



(10) Lanai—Wet Cliff—Unit 1 (731 ac, 296 ha), and Lanai—Wet Cliff—Unit 2 (230 ac, 93 ha)

(i) [Reserved for textual description of Unit 1.] This unit is critical habitat for *Ctenitis squamigera, Cyanea gibsonii, Cyanea munroi, Cyrtandra munroi, Hesperomannia arborescens, Kadua laxiflora, Labordia tinifolia* var. *lanaiensis, Melicope munroi, Phyllostegia haliakalae, Pleomele fernaldii, Santalum haleakalae* var. *lanaiense,* and *Viola lanaiensis.*

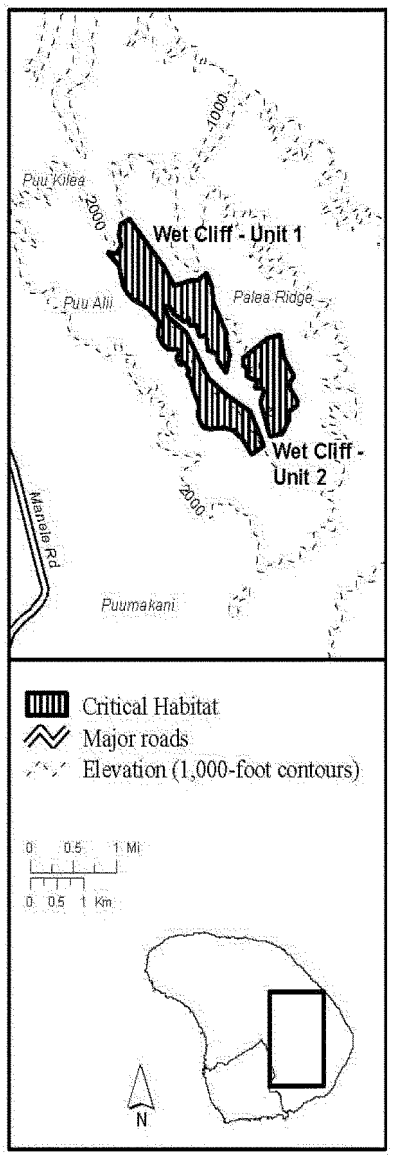
(ii) [Reserved for textual description of Unit 2.] This unit is critical habitat for *Ctenitis squamigera, Cyanea gibsonii, Cyanea munroi, Cyrtandra munroi, Hesperomannia arborescens, Kadua laxiflora, Labordia tinifolia* var. *lanaiensis, Melicope munroi, Phyllostegia haliakalae, Pleomele fernaldii, Santalum haleakalae* var. *lanaiense,* and *Viola lanaiensis.*

(iii) NOTE: Map of Lanai—Wet Cliff—Unit 1 and Lanai—Wet Cliff—Unit 2 (Map 10) follows:

Map 10

Lanai–Wet Cliff

Unit 1 and Unit 2



(11) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR LANAI

Unit name	Species occupied	Species unoccupied
Lanai—Coastal—Unit 1		*Canavalia pubescens.* *Hibiscus brackenridgei.* *Portulaca sclerocarpa.* *Sesbania tomentosa.*
Lanai—Coastal—Unit 2		*Canavalia pubescens.* *Hibiscus brackenridgei.* *Portulaca sclerocarpa.* *Sesbania tomentosa.*
Lanai—Coastal—Unit 3		*Canavalia pubescens.* *Hibiscus brackenridgei.* *Portulaca sclerocarpa.* *Sesbania tomentosa.*
Lanai—Lowland Dry—Unit 1	*Abutilon eremitopetalum*	*Abutilon eremitopetalum.*

(11) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR LANAI—Continued

Unit name	Species occupied	Species unoccupied
		Asplenium dielerectum.
		Bidens micrantha ssp. *kalealaha*.
		Cyperus fauriei.
		Cyperus trachysanthos.
		Hibiscus brackenridgei.
		Neraudia sericea.
		Pleomele fernaldii.
	Schenkia sebaeoides	*Schenkia sebaeoides*.
		Sesbania tomentosa.
		Silene lanceolata.
		Solanum incompletum.
	Spermolepis hawaiiensis	*Spermolepis hawaiiensis*.
		Tetramolopium lepidotum ssp. *lepidotum*.
		Tetramolopium remyi.
		Vigna o-wahuensis.
Lanai—Lowland Dry—Unit 2		*Abutilon eremitopetalum*.
		Asplenium dielerectum.
		Bidens micrantha ssp. *kalealaha*.
		Cyperus fauriei.
		Cyperus trachysanthos.
		Hibiscus brackenridgei.
		Neraudia sericea.
		Pleomele fernaldii.
		Schenkia sebaeoides.
		Sesbania tomentosa.
		Silene lanceolata.
		Solanum incompletum.
		Spermolepis hawaiiensis.
		Tetramolopium lepidotum ssp. *lepidotum*.
		Tetramolopium remyi.
		Vigna o-wahuensis.
Lanai—Lowland Mesic—Unit 1	*Bidens micrantha* ssp. *kalealaha*	*Bidens micrantha* ssp. *kalealaha*.
	Bonamia menziesii	*Bonamia menziesii*.
		Cenchrus agrimonioides.
		Clermontia oblongifolia ssp. *mauiensis*.
		Diplazium molokaiense.
		Kadua cordata ssp. *remyi*.
		Kadua laxiflora.
		Labordia tinifolia var. *lanaiensis*.
	Pleomele fernaldii	*Pleomele fernaldii*.
	Santalum haleakalae var. *lanaiense*	*Santalum haleakalae* var. *lanaiense*.
		Solanum incompletum.
	Spermolepis hawaiiensis	*Spermolepis hawaiiensis*.
		Vigna o-wahuensis.
Lanai—Lowland Wet—Unit 1		*Clermontia oblongifolia* ssp. *mauiensis*.
	Kadua cordata ssp. *remyi*	*Kadua cordata* ssp. *remyi*.
		Kadua laxiflora.
		Labordia tinifolia var. *lanaiensis*.
	Pleomele fernaldii	*Pleomele fernaldii*.
	Santalum haleakalae var. *lanaiense*	*Santalum haleakalae* var. *lanaiense*.
		Zanthoxylum hawaiiense.
Lanai—Lowland Wet—Unit 2		*Clermontia oblongifolia* ssp. *mauiensis*.
		Kadua cordata ssp. *remyi*.
		Kadua laxiflora.
		Labordia tinifolia var. *lanaiensis*.
	Pleomele fernaldii	*Pleomele fernaldii*.
	Santalum haleakalae var. *lanaiense*	*Santalum haleakalae* var. *lanaiense*.
		Zanthoxylum hawaiiense.
Lanai—Montane Wet—Unit 1		*Adenophorus periens*.
	Cyanea gibsonii	*Cyanea gibsonii*.
	Cyanea lobata	*Cyanea lobata*.
	Cyrtandra munroi	*Cyrtandra munroi*.
	Kadua laxiflora	*Kadua laxiflora*.
		Labordia tinifolia var. *lanaiensis*.
	Melicope munroi	*Melicope munroi*.
	Santalum haleakalae var. *lanaiense*	*Santalum haleakalae* var. *lanaiense*.
	Viola lanaiensis	*Viola lanaiensis*.
Lanai—Dry Cliff—Unit 1		*Asplenium dielerectum*.
		Bidens micrantha ssp. *kalealaha*.
		Brighamii rockii.
		Ctenitis squamigera.
		Diplazium molokaiense.

(11) TABLE OF PROTECTED SPECIES WITHIN EACH CRITICAL HABITAT UNIT FOR LANAI—Continued

Unit name	Species occupied	Species unoccupied
		Neraudia sericea.
		Phyllostegia haliakalae.
		Pleomele fernaldii.
		Solanum incompletum.
		Viola lanaiensis.
Lanai—Dry Cliff—Unit 2		*Asplenium dielerectum.*
		Bidens micrantha ssp. *kalealaha.*
		Brighamii rockii.
		Ctenitis squamigera.
		Diplazium molokaiense.
		Neraudia sericea.
		Phyllostegia haliakalae.
	Pleomele fernaldii	*Pleomele fernaldii.*
		Solanum incompletum.
		Viola lanaiensis.
Lanai—Dry Cliff—Unit 3		*Asplenium dielerectum.*
		Bidens micrantha ssp. *kalealaha.*
		Brighamii rockii.
		Ctenitis squamigera.
		Diplazium molokaiense.
		Neraudia sericea.
		Phyllostegia haliakalae.
		Pleomele fernaldii.
		Solanum incompletum.
		Viola lanaiensis.
Lanai—Wet Cliff—Unit 1	*Ctenitis squamigera*	*Ctenitis squamigera.*
		Cyanea gibsonii.
		Cyanea munroi.
	Cyrtandra munroi	*Cyrtandra munroi.*
		Hesperomannia arborescens.
		Kadua laxiflora.
		Labordia tinifolia var. *lanaiensis.*
	Melicope munroi	*Melicope munroi.*
		Phyllostegia haliakalae.
	Pleomele fernaldii	*Pleomele fernaldii.*
	Santalum haleakalae var. *lanaiense*	*Santalum haleakalae* var. *lanaiense.*
		Viola lanaiensis.
Lanai—Wet Cliff—Unit 2		*Ctenitis squamigera.*
		Cyanea gibsonii.
	Cyanea munroi	*Cyanea munroi.*
		Cyrtandra munroi.
		Hesperomannia arborescens.
		Kadua laxiflora.
	Labordia tinifolia var. *lanaiensis*	*Labordia tinifolia* var. *lanaiensis.*
		Melicope munroi.
		Phyllostegia haliakalae.
	Pleomele fernaldii	*Pleomele fernaldii.*
	Santalum haleakalae var. *lanaiense*	*Santalum haleakalae* var. *lanaiense.*
		Viola lanaiensis.

(n) *Plants on Lanai; Constituent elements.*

(1) *Flowering plants.*

Family Apiaceae

Spermolepis hawaiiensis (NCN)

Lanai—Lowland Dry—Unit 1, Lanai—Lowland Dry—Unit 2, and Lanai—Lowland Mesic—Unit 1, identified in the legal descriptions in paragraph (m) of this section, constitute critical habitat for *Spermolepis hawaiiensis* on Lanai.

(i) In units Lanai—Lowland Dry—Unit 1 and Lanai—Lowland Dry—Unit 2, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Less than 50 in (130 cm).

(C) Substrate: Weathered silty loams to stony clay, rocky ledges, little-weathered lava.

(D) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus.*

(E) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia.*

(F) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Sicyos.*

(ii) In unit Lanai—Lowland Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Shallow soils, little to no herbaceous layer.

(D) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(E) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(F) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

Family Asparagaceae

Pleomele fernaldii (HALA PEPE)

Lanai—Lowland Dry—Unit 1, Lanai—Lowland Dry—Unit 2, Lanai—Lowland Mesic—Unit 1, Lanai—Lowland Wet—

Unit 1, Lanai—Lowland Wet—Unit 2, Lanai—Dry Cliff—Unit 1, Lanai—Dry Cliff—Unit 2, Lanai—Dry Cliff—Unit 3, Lanai—Wet Cliff—Unit 1, and Lanai—Wet Cliff—Unit 2, identified in the legal descriptions in paragraph (m) of this section, constitute critical habitat for *Pleomele fernaldii* on Lanai.

(i) In units Lanai—Lowland Dry—Unit 1 and Lanai—Lowland Dry—Unit 2, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Less than 50 in (130 cm).

(C) Substrate: Weathered silty loams to stony clay, rocky ledges, little-weathered lava.

(D) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus.*

(E) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia.*

(F) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Sicyos.*

(ii) In unit Lanai—Lowland Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Shallow soils, little to no herbaceous layer.

(D) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(E) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(F) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

(iii) In units Lanai—Lowland Wet—Unit 1 and Lanai—Lowland Wet—Unit 2, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

(iv) In units Lanai—Dry Cliff—Unit 1, Lanai—Dry Cliff—Unit 2, and Lanai—Dry Cliff—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Less than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, rocky talus.

(D) Canopy: None.

(E) Subcanopy: *Antidesma, Chamaesyce, Diospyros, Dodonaea.*

(F) Understory: *Bidens, Eragrostis, Melanthera, Schiedea.*

(v) In units Lanai—Wet Cliff—Unit 1 and Lanai—Wet Cliff—Unit 2, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.

(D) Canopy: None.

(E) Subcanopy: *Broussaisia, Cheirodendron, Leptocophylla, Metrosideros.*

(F) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Family Asteraceae

Bidens Micrantha ssp. *Kalealaha* (KOOKOOLAU)

Lanai—Lowland Dry—Unit 1, Lanai—Lowland Dry—Unit 2, Lanai—Lowland Mesic—Unit 1, Lanai—Dry Cliff—Unit 1, Lanai—Dry Cliff—Unit 2, and Lanai—Dry Cliff—Unit 3, identified in the legal descriptions in paragraph (m) of this section, constitute critical habitat for *Bidens micrantha* ssp. *kalealaha* on Lanai.

(i) In units Lanai—Lowland Dry—Unit 1 and Lanai—Lowland Dry—Unit 2, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Less than 50 in (130 cm).

(C) Substrate: Weathered silty loams to stony clay, rocky ledges, little-weathered lava.

(D) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus.*

(E) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia.*

(F) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Sicyos.*

(ii) In unit Lanai—Lowland Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Shallow soils, little to no herbaceous layer.

(D) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(E) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(F) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

(iii) In units Lanai—Dry Cliff—Unit 1, Lanai—Dry Cliff—Unit 2, and Lanai—Dry Cliff—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Less than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, rocky talus.

(D) Canopy: None.

(E) Subcanopy: *Antidesma, Chamaesyce, Diospyros, Dodonaea.*

(F) Understory: *Bidens, Eragrostis, Melanthera, Schiedea.*

Hesperomannia arborescens (NCN)

Lanai—Wet Cliff—Unit 1 and Lanai—Wet Cliff—Unit 2, identified in the legal descriptions in paragraph (m) of this section, constitute critical habitat for *Hesperomannia arborescens* on Lanai. In units Lanai—Wet Cliff—Unit 1 and Lanai—Wet Cliff—Unit 2, the physical and biological features of critical habitat are:

(i) Elevation: Unrestricted.

(ii) Annual precipitation: Greater than 75 in (190 cm).

(iii) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.

(iv) Canopy: None.

(v) Subcanopy: *Broussaisia, Cheirodendron, Leptocophylla, Metrosideros.*

(vi) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Tetramolopium lepidotum ssp. *lepidotum* (NCN)

Lanai—Lowland Dry—Unit 1 and Lanai—Lowland Dry—Unit 2, identified in the legal descriptions in paragraph (m) of this section, constitute critical habitat for *Tetramolopium lepidotum* ssp. *lepidotum* on Lanai. In units Lanai—Lowland Dry—Unit 1 and Lanai—Lowland Dry—Unit 2, the physical and biological features of critical habitat are:

(i) Elevation: Less than 3,300 ft (1,000 m).

(ii) Annual precipitation: Less than 50 in (130 cm).

(iii) Substrate: Weathered silty loams to stony clay, rocky ledges, little-weathered lava.

(iv) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus.*

(v) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia.*

(vi) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Sicyos.*

Tetramolopium remyi (NCN)

Lanai—Lowland Dry—Unit 1 and Lanai—Lowland Dry—Unit 2, identified in the legal descriptions in paragraph (m) of this section, constitute critical habitat for *Tetramolopium remyi* on Lanai. In units Lanai—Lowland Dry—Unit 1 and Lanai—Lowland Dry—Unit 2, the physical and biological features of critical habitat are:

(i) Elevation: Less than 3,300 ft (1,000 m).

(ii) Annual precipitation: Less than 50 in (130 cm).

(iii) Substrate: Weathered silty loams to stony clay, rocky ledges, little-weathered lava.

(iv) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus.*

(v) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia.*

(vi) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Sicyos.*

Family Campanulaceae

Brighamii rockii (PUA ALA)

Lanai—Dry Cliff—Unit 1, Lanai—Dry Cliff—Unit 2, and Lanai—Dry Cliff—Unit 3, identified in the legal descriptions in paragraph (m) of this section, constitute critical habitat for *Brighamii rockii* on Lanai. In units Lanai—Dry Cliff—Unit 1, Lanai—Dry Cliff—Unit 2, and Lanai—Dry Cliff—Unit 3, the physical and biological features of critical habitat are:

(i) Elevation: Unrestricted.

(ii) Annual precipitation: Less than 75 in (190 cm).

(iii) Substrate: Greater than 65 degree slope, rocky talus.

(iv) Canopy: None.

(v) Subcanopy: *Antidesma, Chamaesyce, Diospyros, Dodonaea.*

(vi) Understory: *Bidens, Eragrostis, Melanthera, Schiedea.*

Clermontia oblongifolia ssp. *mauiensis* (OHA WAI)

Lanai—Lowland Mesic—Unit 1, Lanai—Lowland Wet—Unit 1, and Lanai—Lowland Wet—Unit 2, identified in the legal descriptions in paragraph (m) of this section, constitute critical habitat for *Clermontia oblongifolia* ssp. *mauiensis* on Lanai.

(i) In unit Lanai—Lowland Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Shallow soils, little to no herbaceous layer.

(D) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(E) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(F) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

(ii) In units Lanai—Lowland Wet—Unit 1 and Lanai—Lowland Wet—Unit 2, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

Cyanea gibsonii (NCN)

Lanai—Montane Wet—Unit 1, Lanai—Wet Cliff—Unit 1, and Lanai—Wet Cliff—Unit 2, identified in the legal descriptions in paragraph (m) of this section, constitute critical habitat for *Cyanea gibsonii* on Lanai.

(i) In unit Lanai—Montane Wet—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Well-developed soils, montane bogs.

(D) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(E) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(F) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

(ii) In units Lanai—Wet Cliff—Unit 1 and Lanai—Wet Cliff—Unit 2, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.

(D) Canopy: None.

(E) Subcanopy: *Broussaisia, Cheirodendron, Leptocophylla, Metrosideros.*

(F) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Cyanea lobata (HAHA)

Lanai—Montane Wet—Unit 1, identified in the legal descriptions in paragraph (m) of this section, constitutes critical habitat for *Cyanea lobata* on Lanai. In unit Lanai—Montane Wet—Unit 1, the physical and biological features of critical habitat are:

(i) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(ii) Annual precipitation: Greater than 75 in (190 cm).

(iii) Substrate: Well-developed soils, montane bogs.

(iv) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(v) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(vi) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

Cyanea munroi (HAHA)

Lanai—Wet Cliff—Unit 1 and Lanai—Wet Cliff—Unit 2, identified in the legal descriptions in paragraph (m) of this section, constitute critical habitat for *Cyanea munroi* on Lanai. In units Lanai—Wet Cliff—Unit 1 and Lanai—Wet Cliff—Unit 2, the physical and biological features of critical habitat are:

(i) Elevation: Unrestricted.

(ii) Annual precipitation: Greater than 75 in (190 cm).

(iii) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.

(iv) Canopy: None.

(v) Subcanopy: *Broussaisia, Cheirodendron, Leptocophylla, Metrosideros.*

(vi) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Family Caryophyllaceae

Silene lanceolata (NCN)

Lanai—Lowland Dry—Unit 1 and Lanai—Lowland Dry—Unit 2, identified in the legal descriptions in paragraph (m) of this section, constitute critical habitat for *Silene lanceolata* on Lanai. In units Lanai—Lowland Dry—Unit 1 and Lanai—Lowland Dry—Unit 2, the physical and biological features of critical habitat are:

(i) Elevation: Less than 3,300 ft (1,000 m).

(ii) Annual precipitation: Less than 50 in (130 cm).

(iii) Substrate: Weathered silty loams to stony clay, rocky ledges, little-weathered lava.

(iv) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus.*

(v) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia.*

(vi) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Sicyos.*

Family Convolvulaceae

Bonamia menziesii (NCN)

Lanai—Lowland Mesic—Unit 1, identified in the legal descriptions in paragraph (m) of this section, constitutes critical habitat for *Bonamia menziesii* on Lanai. In unit Lanai—Lowland Mesic—Unit 1, the physical and biological features of critical habitat are:

(i) Elevation: Less than 3,300 ft (1,000 m).

(ii) Annual precipitation: 50 to 75 in (130 to 190 cm).

(iii) Substrate: Shallow soils, little to no herbaceous layer.

(iv) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(v) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(vi) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

Family Cyperaceae

Cyperus fauriei (NCN)

Lanai—Lowland Dry—Unit 1 and Lanai—Lowland Dry—Unit 2, identified in the legal descriptions in paragraph (m) of this section, constitute critical habitat for *Cyperus fauriei* on Lanai. In units Lanai—Lowland Dry—Unit 1 and Lanai—Lowland Dry—Unit 2, the physical and biological features of critical habitat are:

(i) Elevation: Less than 3,300 ft (1,000 m).

(ii) Annual precipitation: Less than 50 in (130 cm).

(iii) Substrate: Weathered silty loams to stony clay, rocky ledges, little-weathered lava.

(iv) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus.*

(v) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia.*

(vi) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Sicyos.*

Cyperus trachysanthos (PUUKAA)

Lanai—Lowland Dry—Unit 1 and Lanai—Lowland Dry—Unit 2, identified in the legal descriptions in paragraph (m) of this section, constitute critical habitat for *Cyperus trachysanthos* on Lanai. In units Lanai—Lowland Dry—Unit 1 and Lanai—Lowland Dry—Unit 2, the physical and biological features of critical habitat are:

(i) Elevation: Less than 3,300 ft (1,000 m).

(ii) Annual precipitation: Less than 50 in (130 cm).

(iii) Substrate: Weathered silty loams to stony clay, rocky ledges, little-weathered lava.

(iv) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus.*

(v) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia.*

(vi) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Sicyos.*

Family Fabaceae

Canavalia pubescens (AWIKIWIKI)

Lanai—Coastal—Unit 1, Lanai—Coastal—Unit 2, and Lanai—Coastal—Unit 3, identified in the legal descriptions in paragraph (m) of this section, constitute critical habitat for *Canavalia pubescens* on Lanai. In units Lanai—Coastal—Unit 1, Lanai—Coastal—Unit 2, and Lanai—Coastal—Unit 3, the physical and biological features of critical habitat are:

(i) Elevation: Less than 980 ft (300 m).

(ii) Annual precipitation: Less than 20 in (50 cm).

(iii) Substrate: Well-drained, calcareous, talus slopes; weathered clay soils; ephemeral pools; mudflats.

(iv) Canopy: *Hibiscus, Myoporum, Santalum, Scaevola.*

(v) Subcanopy: *Gossypium, Sida, Vitex.*

(vi) Understory: *Eragrostis, Jacquemontia, Lyceum, Nama, Sesuvium, Sporobolus, Vigna.*

Sesbania tomentosa (OHAI)

Lanai—Coastal—Unit 1, Lanai—Coastal—Unit 2, Lanai—Coastal—Unit 3, Lanai—Lowland Dry—Unit 1, and Lanai—Lowland Dry—Unit 2, identified in the legal descriptions in paragraph (m) of this section, constitute critical habitat for *Sesbania tomentosa* on Lanai.

(i) In units Lanai—Coastal—Unit 1, Lanai—Coastal—Unit 2, and Lanai—Coastal—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: Less than 980 ft (300 m).

(B) Annual precipitation: Less than 20 in (50 cm).

(C) Substrate: Well-drained, calcareous, talus slopes; weathered clay soils; ephemeral pools; mudflats.

(D) Canopy: *Hibiscus, Myoporum, Santalum, Scaevola.*

(E) Subcanopy: *Gossypium, Sida, Vitex.*

(F) Understory: *Eragrostis, Jacquemontia, Lyceum, Nama, Sesuvium, Sporobolus, Vigna.*

(ii) In units Lanai—Lowland Dry—Unit 1 and Lanai—Lowland Dry—Unit 2, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Less than 50 in (130 cm).

(C) Substrate: Weathered silty loams to stony clay, rocky ledges, little-weathered lava.

(D) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus.*

(E) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia.*

(F) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Sicyos.*

Vigna o-wahuensis (NCN)

Lanai—Lowland Dry—Unit 1, Lanai—Lowland Dry—Unit 2, and Lanai—Lowland Mesic—Unit 1, identified in the legal descriptions in paragraph (m) of this section, constitute critical habitat for *Vigna o-wahuensis* on Lanai.

(i) In units Lanai—Lowland Dry—Unit 1 and Lanai—Lowland Dry—Unit 2, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Less than 50 in (130 cm).

(C) Substrate: Weathered silty loams to stony clay, rocky ledges, little-weathered lava.

(D) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus.*

(E) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia.*

(F) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Sicyos.*

(ii) In unit Lanai—Lowland Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Shallow soils, little to no herbaceous layer.

(D) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(E) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(F) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

Family Gentianaceae

Schenkia sebaeoides (AWIWI)

Lanai—Lowland Dry—Unit 1 and Lanai—Lowland Dry—Unit 2, identified in the legal descriptions in paragraph (m) of this section, constitute critical habitat for *Schenkia sebaeoides* on Lanai. In units Lanai—Lowland Dry—

Unit 1 and Lanai—Lowland Dry—Unit 2, the physical and biological features of critical habitat are:

(i) Elevation: Less than 3,300 ft (1,000 m).

(ii) Annual precipitation: Less than 50 in (130 cm).

(iii) Substrate: Weathered silty loams to stony clay, rocky ledges, little-weathered lava.

(iv) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus.*

(v) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia.*

(vi) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Sicyos.*

Family Gesneriaceae

Cyrtandra munroi (HAIWALE)

Lanai—Montane Wet—Unit 1, Lanai—Wet Cliff—Unit 1, and Lanai—Wet Cliff—Unit 2, identified in the legal descriptions in paragraph (m) of this section, constitute critical habitat for *Cyrtandra munroi* on Lanai.

(i) In unit Lanai—Montane Wet—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Well-developed soils, montane bogs.

(D) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(E) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(F) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

(ii) In units Lanai—Wet Cliff—Unit 1 and Lanai—Wet Cliff—Unit 2, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.

(D) Canopy: None.

(E) Subcanopy: *Broussaisia, Cheirodendron, Leptocophylla, Metrosideros.*

(F) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Family Lamiaceae

Phyllostegia haliakalae (NCN)

Lanai—Dry Cliff—Unit 1, Lanai—Dry Cliff—Unit 2, Lanai—Dry Cliff—Unit 3, Lanai—Wet Cliff—Unit 1, and Lanai—Wet Cliff—Unit 2, identified in the legal descriptions in paragraph (m) of this section, constitute critical habitat for *Phyllostegia haliakalae* on Lanai.

(i) In units Lanai—Dry Cliff—Unit 1, Lanai—Dry Cliff—Unit 2, and Lanai—Dry Cliff—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Less than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, rocky talus.

(D) Canopy: None.

(E) Subcanopy: *Antidesma, Chamaesyce, Diospyros, Dodonaea.*

(F) Understory: *Bidens, Eragrostis, Melanthera, Schiedea.*

(ii) In units Lanai—Wet Cliff—Unit 1 and Lanai—Wet Cliff—Unit 2, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.

(D) Canopy: None.

(E) Subcanopy: *Broussaisia, Cheirodendron, Leptocophylla, Metrosideros.*

(F) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Family Loganiaceae

Labordia tinifolia var. *lanaiensis* (KAMAKAHALA)

Lanai—Lowland Mesic—Unit 1, Lanai—Lowland Wet—Unit 1, Lanai—Lowland Wet—Unit 2, Lanai—Montane Wet—Unit 1, Lanai—Wet Cliff—Unit 1, and Lanai—Wet Cliff—Unit 2, identified in the legal descriptions in paragraph (m) of this section, constitute critical habitat for *Labordia tinifolia* var. *lanaiensis* on Lanai.

(i) In unit Lanai—Lowland Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Shallow soils, little to no herbaceous layer.

(D) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(E) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(F) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

(ii) In units Lanai—Lowland Wet—Unit 1 and Lanai—Lowland Wet—Unit 2, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

(iii) In unit Lanai—Montane Wet—Unit 1; the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Well-developed soils, montane bogs.

(D) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(E) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(F) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

(iv) In units Lanai—Wet Cliff—Unit 1 and Lanai—Wet Cliff—Unit 2, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.

(D) Canopy: None.

(E) Subcanopy: *Broussaisia, Cheirodendron, Leptocophylla, Metrosideros.*

(F) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Family Malvaceae

Abutilon eremitopetalum (NCN)

Lanai—Lowland Dry—Unit 1 and Lanai—Lowland Dry—Unit 2, identified in the legal descriptions in paragraph (m) of this section, constitute critical habitat for *Abutilon eremitopetalum* on Lanai. In units Lanai—Lowland Dry—Unit 1 and Lanai—Lowland Dry—Unit 2, the physical and biological features of critical habitat are:

(i) Elevation: Less than 3,300 ft (1,000 m).

(ii) Annual precipitation: Less than 50 in (130 cm).

(iii) Substrate: Weathered silty loams to stony clay, rocky ledges, little-weathered lava.

(iv) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus.*

(v) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia.*

(vi) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Sicyos.*

Hibiscus brackenridgei (MAO HAU HELE)

Lanai—Coastal—Unit 1, Lanai—Coastal—Unit 2, Lanai—Coastal—Unit 3, Lanai—Lowland Dry—Unit 1, and Lanai—Lowland Dry—Unit 2, identified in the legal descriptions in paragraph (m) of this section, constitute critical habitat for *Hibiscus brackenridgei* on Lanai.

(i) In units Lanai—Coastal—Unit 1, Lanai—Coastal—Unit 2, and Lanai—Coastal—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: Less than 980 ft (300 m).

(B) Annual precipitation: Less than 20 in (50 cm).

(C) Substrate: Well-drained, calcareous, talus slopes; weathered clay soils; ephemeral pools; mudflats.

(D) Canopy: *Hibiscus, Myoporum, Santalum, Scaevola.*

(E) Subcanopy: *Gossypium, Sida, Vitex.*

(F) Understory: *Eragrostis, Jacquemontia, Lyceum, Nama, Sesuvium, Sporobolus, Vigna.*

(ii) In units Lanai—Lowland Dry—Unit 1 and Lanai—Lowland Dry—Unit 2, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Less than 50 in (130 cm).

(C) Substrate: Weathered silty loams to stony clay, rocky ledges, little-weathered lava.

(D) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus.*

(E) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia.*

(F) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Sicyos.*

Family Poaceae

Cenchrus agrimonioides (KAMANOMANO (= SANDBUR, AGRIMONY))

Lanai—Lowland Mesic—Unit 1, identified in the legal descriptions in paragraph (m) of this section, constitutes critical habitat for *Cenchrus agrimonioides* on Lanai. In unit Lanai—Lowland Mesic—Unit 1, the physical and biological features of critical habitat are:

(i) Elevation: Less than 3,300 ft (1,000 m).

(ii) Annual precipitation: 50 to 75 in (130 to 190 cm).

(iii) Substrate: Shallow soils, little to no herbaceous layer.

(iv) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(v) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(vi) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

Family Portulacaceae:

Lanai—Coastal—Unit 1, Lanai—Coastal—Unit 2, and Lanai—Coastal—Unit 3, identified in the legal descriptions in paragraph (m) of this section, constitute critical habitat for *Portulaca sclerocarpa* on Lanai. In units Lanai—Coastal—Unit 1, Lanai—Coastal—Unit 2, and Lanai—Coastal—Unit 3, the physical and biological features of critical habitat are:

(i) Elevation: Less than 980 ft (300 m).

(ii) Annual precipitation: Less than 20 in (50 cm).

(iii) Substrate: Well-drained, calcareous, talus slopes; weathered clay soils; ephemeral pools; mudflats.

(iv) Canopy: *Hibiscus, Myoporum, Santalum, Scaevola.*

(v) Subcanopy: *Gossypium, Sida, Vitex.*

(vi) Understory: *Eragrostis, Jacquemontia, Lyceum, Nama, Sesuvium, Sporobolus, Vigna.*

Family Rubiaceae

Kadua cordata ssp. *remyi* (KOPA)

Lanai—Lowland Mesic—Unit 1, Lanai—Lowland Wet—Unit 1, and Lanai—Lowland Wet—Unit 2, identified in the legal descriptions in paragraph (m) of this section, constitute critical habitat for *Kadua cordata* ssp. *remyi* on Lanai.

(i) In unit Lanai—Lowland Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Shallow soils, little to no herbaceous layer.

(D) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(E) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(F) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

(ii) In units Lanai—Lowland Wet—Unit 1 and Lanai—Lowland Wet—Unit 2, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

Kadua laxiflora (PILO)

Lanai—Lowland Mesic—Unit 1, Lanai—Lowland Wet—Unit 1, Lanai—Lowland Wet—Unit 2, Lanai—Montane Wet—Unit 1, Lanai—Wet Cliff—Unit 1, and Lanai—Wet Cliff—Unit 2, identified in the legal descriptions in paragraph (m) of this section, constitute critical habitat for *Kadua laxiflora* on Lanai.

(i) In unit Lanai—Lowland Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Shallow soils, little to no herbaceous layer.

(D) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(E) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(F) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

(ii) In units Lanai—Lowland Wet—Unit 1 and Lanai—Lowland Wet—Unit 2, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.

(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*

(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*

(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

(iii) In unit Lanai—Montane Wet—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Well-developed soils, montane bogs.

(D) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(E) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(F) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

(iv) In units Lanai—Wet Cliff—Unit 1 and Lanai—Wet Cliff—Unit 2, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.
(B) Annual precipitation: Greater than 75 in (190 cm).
(C) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.
(D) Canopy: None.
(E) Subcanopy: *Broussaisia, Cheirodendron, Leptocophylla, Metrosideros.*
(F) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Family Rutaceae

Melicope munroi (ALANI)

Lanai—Montane Wet—Unit 1, Lanai—Wet Cliff—Unit 1, and Lanai—Wet Cliff—Unit 2, identified in the legal descriptions in paragraph (m) of this section, constitute critical habitat for *Melicope munroi* on Lanai.
(i) In unit Lanai—Montane Wet—Unit 1, the physical and biological features of critical habitat are:
(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).
(B) Annual precipitation: Greater than 75 in (190 cm).
(C) Substrate: Well-developed soils, montane bogs.
(D) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*
(E) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*
(F) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*
(ii) In units Lanai—Wet Cliff—Unit 1 and Lanai—Wet Cliff—Unit 2, the physical and biological features of critical habitat are:
(A) Elevation: Unrestricted.
(B) Annual precipitation: Greater than 75 in (190 cm).
(C) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.
(D) Canopy: None.
(E) Subcanopy: *Broussaisia, Cheirodendron, Leptocophylla, Metrosideros.*
(F) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Zanthoxylum hawaiiense (AE)

Lanai—Lowland Wet—Unit 1 and Lanai—Lowland Wet—Unit 2, identified in the legal descriptions in paragraph (m) of this section, constitute critical habitat for *Zanthoxylum hawaiiense* on Lanai. In units Lanai—Lowland Wet—Unit 1 and Lanai—Lowland Wet—Unit 2, the physical and biological features of critical habitat are:
(i) Elevation: Less than 3,300 ft (1,000 m).
(ii) Annual precipitation: Greater than 75 in (190 cm).
(iii) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.
(iv) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*
(v) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*
(vi) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*

Family Santalaceae

Santalum haleakalae var. *lanaiense* (LANAI SANDALWOOD, ILIAHI)

Lanai—Lowland Mesic—Unit 1, Lanai—Lowland Wet—Unit 1, Lanai—Lowland Wet—Unit 2, Lanai—Montane Wet—Unit 1, Lanai—Wet Cliff—Unit 1, and Lanai—Wet Cliff—Unit 2, identified in the legal descriptions in paragraph (m) of this section, constitute critical habitat for *Santalum haleakalae* var. *lanaiense* on Lanai.
(i) In unit Lanai—Lowland Mesic—Unit 1, the physical and biological features of critical habitat are:
(A) Elevation: Less than 3,300 ft (1,000 m).
(B) Annual precipitation: 50 to 75 in (130 to 190 cm).
(C) Substrate: Shallow soils, little to no herbaceous layer.
(D) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*
(E) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*
(F) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*
(ii) In units Lanai—Lowland Wet—Unit 1 and Lanai—Lowland Wet—Unit 2, the physical and biological features of critical habitat are:
(A) Elevation: Less than 3,300 ft (1,000 m).
(B) Annual precipitation: Greater than 75 in (190 cm).
(C) Substrate: Clays; ashbeds; deep, well-drained soils; lowland bogs.
(D) Canopy: *Antidesma, Metrosideros, Myrsine, Pisonia, Psychotria.*
(E) Subcanopy: *Cibotium, Claoxylon, Kadua, Melicope.*
(F) Understory: *Alyxia, Cyrtandra, Dicranopteris, Diplazium, Machaerina, Microlepia.*
(iii) In unit Lanai—Montane Wet—Unit 1, the physical and biological features of critical habitat are:
(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).
(B) Annual precipitation: Greater than 75 in (190 cm).
(C) Substrate: Well-developed soils, montane bogs.
(D) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*
(E) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*
(F) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*
(iv) In units Lanai—Wet Cliff—Unit 1 and Lanai—Wet Cliff—Unit 2, the physical and biological features of critical habitat are:
(A) Elevation: Unrestricted.
(B) Annual precipitation: Greater than 75 in (190 cm).
(C) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.
(D) Canopy: None.
(E) Subcanopy: *Broussaisia, Cheirodendron, Leptocophylla, Metrosideros.*
(F) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Family Solanaceae

Solanum incompletum (POPOLO KU MAI)

Lanai—Lowland Dry—Unit 1, Lanai—Lowland Dry—Unit 2, Lanai—Lowland Mesic—Unit 1, Lanai—Dry Cliff—Unit 1, Lanai—Dry Cliff—Unit 2, and Lanai—Dry Cliff—Unit 3, identified in the legal descriptions in paragraph (m) of this section, constitute critical habitat for *Solanum incompletum* on Lanai.
(i) In units Lanai—Lowland Dry—Unit 1 and Lanai—Lowland Dry—Unit 2, the physical and biological features of critical habitat are:
(A) Elevation: Less than 3,300 ft (1,000 m).
(B) Annual precipitation: Less than 50 in (130 cm).
(C) Substrate: Weathered silty loams to stony clay, rocky ledges, little-weathered lava.
(D) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus.*
(E) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia.*
(F) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Sicyos.*
(ii) In unit Lanai—Lowland Mesic—Unit 1, the physical and biological features of critical habitat are:
(A) Elevation: Less than 3,300 ft (1,000 m).
(B) Annual precipitation: 50 to 75 in (130 to 190 cm).
(C) Substrate: Shallow soils, little to no herbaceous layer.
(D) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*
(E) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*
(F) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*
(iii) In units Lanai—Dry Cliff—Unit 1, Lanai—Dry Cliff—Unit 2, and Lanai—

Dry Cliff—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Less than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, rocky talus.

(D) Canopy: None.

(E) Subcanopy: *Antidesma, Chamaesyce, Diospyros, Dodonaea.*

(F) Understory: *Bidens, Eragrostis, Melanthera, Schiedea.*

Family Urticaceae

Neraudia sericea (NCN)

Lanai—Lowland Dry—Unit 1, Lanai—Lowland Dry—Unit 2, Lanai—Dry Cliff—Unit 1, Lanai—Dry Cliff—Unit 2, and Lanai—Dry Cliff—Unit 3, identified in the legal descriptions in paragraph (m) of this section, constitute critical habitat for *Neraudia sericea* on Lanai.

(i) In units Lanai—Lowland Dry—Unit 1 and Lanai—Lowland Dry—Unit 2, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Less than 50 in (130 cm).

(C) Substrate: Weathered silty loams to stony clay, rocky ledges, little-weathered lava.

(D) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus.*

(E) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia.*

(F) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Sicyos.*

(ii) In units Lanai—Dry Cliff—Unit 1, Lanai—Dry Cliff—Unit 2, and Lanai—Dry Cliff—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Less than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, rocky talus.

(D) Canopy: None.

(E) Subcanopy: *Antidesma, Chamaesyce, Diospyros, Dodonaea.*

(F) Understory: *Bidens, Eragrostis, Melanthera, Schiedea.*

Family Violaceae

Viola lanaiensis (NCN)

Lanai—Montane Wet—Unit 1, Lanai—Dry Cliff—Unit 1, Lanai—Dry Cliff—Unit 2, Lanai—Dry Cliff—Unit 3, Lanai—Wet Cliff—Unit 1, and Lanai—Wet Cliff—Unit 2, identified in the legal descriptions in paragraph (m) of this section, constitute critical habitat for *Viola lanaiensis* on Lanai.

(i) In unit Lanai—Montane Wet—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Well-developed soils, montane bogs.

(D) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(E) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(F) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

(ii) In units Lanai—Dry Cliff—Unit 1, Lanai—Dry Cliff—Unit 2, and Lanai—Dry Cliff—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Less than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, rocky talus.

(D) Canopy: None.

(E) Subcanopy: *Antidesma, Chamaesyce, Diospyros, Dodonaea.*

(F) Understory: *Bidens, Eragrostis, Melanthera, Schiedea.*

(iii) In units Lanai–Wet Cliff–Unit 1 and Lanai–Wet Cliff–Unit 2, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.

(D) Canopy: None.

(E) Subcanopy: *Broussaisia, Cheirodendron, Leptocophylla, Metrosideros.*

(F) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

(2) *Ferns and fern allies.*

Family Aspleniaceae

Asplenium dielerectum (ASPLENIUM–LEAVED DIELLIA)

Lanai—Lowland Dry—Unit 1, Lanai—Lowland Dry—Unit 2, Lanai—Dry Cliff—Unit 1, Lanai—Dry Cliff—Unit 2, and Lanai—Dry Cliff—Unit 3, identified in the legal descriptions in paragraph (m) of this section, constitute critical habitat for *Asplenium dielerectum* on Lanai.

(i) In units Lanai—Lowland Dry—Unit 1 and Lanai—Lowland Dry—Unit 2, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: Less than 50 in (130 cm).

(C) Substrate: Weathered silty loams to stony clay, rocky ledges, little-weathered lava.

(D) Canopy: *Diospyros, Myoporum, Pleomele, Santalum, Sapindus.*

(E) Subcanopy: *Chamaesyce, Dodonaea, Leptecophylla, Osteomeles, Psydrax, Scaevola, Wikstroemia.*

(F) Understory: *Alyxia, Artemisia, Bidens, Chenopodium, Nephrolepis, Peperomia, Sicyos.*

(ii) In units Lanai—Dry Cliff—Unit 1, Lanai—Dry Cliff—Unit 2, and Lanai—Dry Cliff—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Less than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, rocky talus.

(D) Canopy: None.

(E) Subcanopy: *Antidesma, Chamaesyce, Diospyros, Dodonaea.*

(F) Understory: *Bidens, Eragrostis, Melanthera, Schiedea.*

Ctenitis squamigera (PAUOA)

Lanai—Dry Cliff—Unit 1, Lanai—Dry Cliff—Unit 2, Lanai—Dry Cliff—Unit 3, Lanai—Wet Cliff—Unit 1, and Lanai—Wet Cliff—Unit 2, identified in the legal descriptions in paragraph (m) of this section, constitute critical habitat for *Ctenitis squamigera* on Lanai.

(i) In units Lanai—Dry Cliff—Unit 1, Lanai—Dry Cliff—Unit 2, and Lanai—Dry Cliff—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Less than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, rocky talus.

(D) Canopy: None.

(E) Subcanopy: *Antidesma, Chamaesyce, Diospyros, Dodonaea.*

(F) Understory: *Bidens, Eragrostis, Melanthera, Schiedea.*

(ii) In units Lanai—Wet Cliff—Unit 1 and Lanai—Wet Cliff—Unit 2, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Greater than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, shallow soils, weathered lava.

(D) Canopy: None.

(E) Subcanopy: *Broussaisia, Cheirodendron, Leptocophylla, Metrosideros.*

(F) Understory: Bryophytes, ferns, *Coprosma, Dubautia, Kadua, Peperomia.*

Diplazium molokaiense (NCN)

Lanai—Lowland Mesic—Unit 1, Lanai—Dry Cliff—Unit 1, Lanai—Dry Cliff—Unit 2, and Lanai—Dry Cliff—Unit 3, identified in the legal descriptions in paragraph (m) of this section, constitute critical habitat for *Diplazium molokaiense* on Lanai.

(i) In unit Lanai—Lowland Mesic—Unit 1, the physical and biological features of critical habitat are:

(A) Elevation: Less than 3,300 ft (1,000 m).

(B) Annual precipitation: 50 to 75 in (130 to 190 cm).

(C) Substrate: Shallow soils, little to no herbaceous layer.

(D) Canopy: *Acacia, Diospyros, Metrosideros, Myrsine, Pouteria, Santalum.*

(E) Subcanopy: *Dodonaea, Freycinetia, Leptecophylla, Melanthera, Osteomeles, Pleomele, Psydrax.*

(F) Understory: *Carex, Dicranopteris, Diplazium, Elaphoglossum, Peperomia.*

(ii) In units Lanai—Dry Cliff—Unit 1, Lanai—Dry Cliff—Unit 2, and Lanai—Dry Cliff—Unit 3, the physical and biological features of critical habitat are:

(A) Elevation: Unrestricted.

(B) Annual precipitation: Less than 75 in (190 cm).

(C) Substrate: Greater than 65 degree slope, rocky talus.

(D) Canopy: None.

(E) Subcanopy: *Antidesma, Chamaesyce, Diospyros, Dodonaea.*

(F) Understory: *Bidens, Eragrostis, Melanthera, Schiedea.*

Family Grammitidaceae

Adenophorus periens (PENDANT KIHI FERN)

Lanai—Montane Wet—Unit 1, identified in the legal descriptions in paragraph (m) of this section, constitutes critical habitat for *Adenophorus periens* on Lanai. In unit Lanai—Montane Wet—Unit 1; the physical and biological features of critical habitat are:

(i) Elevation: 3,300 to 6,500 ft (1,000 to 2,000 m).

(ii) Annual precipitation: Greater than 75 in (190 cm).

(iii) Substrate: Well-developed soils, montane bogs.

(iv) Canopy: *Acacia, Charpentiera, Cheirodendron, Metrosideros.*

(v) Subcanopy: *Broussaisia, Cibotium, Eurya, Ilex, Myrsine.*

(vi) Understory: Ferns, *Carex, Coprosma, Leptecophylla, Oreobolus, Rhynchospora, Vaccinium.*

* * * * *

Dated: May 3, 2012.

Rachel Jacobson,

Acting Assistant Secretary for Fish and Wildlife and Parks.

[FR Doc. 2012–11484 Filed 6–8–12; 8:45 am]

BILLING CODE 4310–55–P